
**SI-FOTODETEKTOREN, OPTISCHE SENSOREN
UND IR-LUMINESZENZDIODEN**

**SILICON PHOTODETECTORS, OPTICAL SENSORS
AND INFRARED EMITTERS**

SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

SI-FOTODETEKTOREN

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- 4.4. Doppelfotodioden

OPTISCHE SENSOREN

1. Gabellichtschranken

2. SMT Reflexlichtschranken

SILICON PHOTODETECTORS

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- 1.1. SMT Transistors
 - 1.1.1. SMT Transistors in low profile, narrow angle MIDLED package
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 - 1.1.3. SMT Transistor with V_{λ} -Curve
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 - 1.2.2. Plastic package with daylight filter for 880/950nm IRED
 - 1.2.3. Dual Phototransistor
 - 1.2.4. Arrays in plastic package
- 1.3. Phototransistors in metal package

2. Photodiodes

- 2.1. SMT photodiodes
 - 2.1.1. SMT PIN photodiodes in clear package
 - 2.1.2. SMT PIN photodiodes with V_{λ} -Curve
 - 2.1.3. SMT PIN photodiodes with daylight filter
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- 2.2. PIN photodiodes in plastic package
 - 2.2.1. Clear plastic package
 - 2.2.2. Package with daylight filter for 880nm IRED
 - 2.2.3. Package with daylight filter for 950nm IRED
- 2.3. PIN Photodiodes in metal package

3. Photo ICs

- 3.1. Schmitt Trigger IC
- 3.2. Linear amplifier with voltage output
- 3.3. Photo IC for Remote Control

4. Photodetectors for special applications

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- 4.2. Photodetectors for the visible range
- 4.3. Large area PIN photodiode
- 4.4. Dual photodiodes

OPTICAL SENSORS

1. Slotted interrupters

2. SMT Reflective Sensors

IR-LUMINESZENZDIODEN

1. Emitter in SMT

- 1.1. Flaches, engwinkliges MIDLED Gehäuse
- 1.2. SmartLED®
- 1.3. TOPLED® / SIDELED® Familie
- 1.4. SMR

2. Hochleistungsemitter 850nm

3. Sehr schnelle Emitter 950nm

4. Emitter im Plastikgehäuse

- 4.1. Radiale Gehäuse
- 4.2. Sidelooker
- 4.3. Zeilen im Plastikgehäuse

5. Emitter im Metallgehäuse

1. Emitter in SMT

- 1.1. Low profile, narrow angle MIDLED® package
- 1.2. SmartLED®
- 1.3. TOPLED® / SIDELED® family
- 1.4. SMR

2. High power emitter 850nm

3. High speed emitter 950nm

4. Emitter in plastic package

- 4.1. Radial packages
- 4.2. Sidelooker
- 4.3. Arrays in plastic package

5. Emitter in metal package

TYPENÜBERSICHT

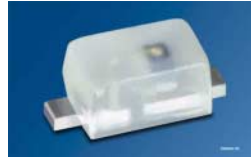
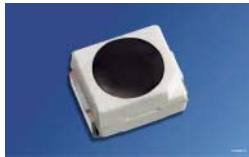
SUMMARY OF TYPES

1. Fototransistoren

1.1.SMT Transistoren



TOPTLED®
SFH 320
SFH 320 FA



SmartLED®
SFH 3010
TOPTLED® with Lens
SFH 3219



TOPTLED® RG
SFH 3211
SFH 3211 FA



SIDELED®
SFH 325
SFH 325 FA



Multi TOPTLED®
SFH 331 / SFH 7221 /
SFH 7225 / SFH 7226



MIDLED
SFH 3600 / SFH 3605



Micro SIDELED®
SFH 3204



SMR
SFH 3500
SFH 3505



SMR
SFH 3500 FA
SFH 3505 FA



SMART DIL
SFH 3400 / SFH 3401



SFH 3201



TYPENÜBERSICHT

SUMMARY OF TYPES

1.2. Fototransistoren im Plastikgehäuse

1.2. Phototransistors in plastic package



SFH 309 / SFH 310
SFH 309 FA / SFH 310 FA



SFH 309 P
SFH 309 PFA



SFH 300 / SFH 313 / SFH 314
SFH 300 FA / SFH 313 FA /
SFH 314 FA



SFH 303
SFH 303 FA



LPT 80 A



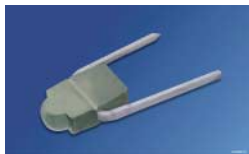
SFH 3100 F



SFH 3160 F



SFH 3162 F
SFH 3163 F



SFH 305



BPX 81



BPX 83

1.3. Fototransistoren im Metallgehäuse

1.3. Phototransistors in metal package



BPY 62 / BPX 43



BPX 38



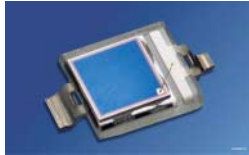
BP 103

TYPENÜBERSICHT

SUMMARY OF TYPES

2. Fotodioden

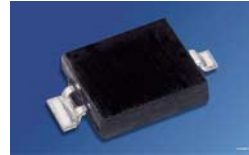
2.1.SMT-Fotodioden



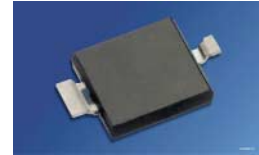
BP 104 S / BPW 34 S /
BPW 34 BS



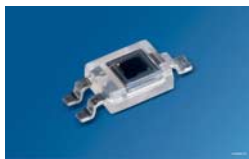
BPW 34 S R18R



BP 104 FS / BP 104 FAS /
BPW 34 FS / BPW 34 FAS



BPW 34 FS R18R /
BPW 34 FAS R18R



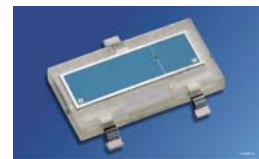
SMART DIL
SFH 2400
SFH 2400 FA



SMR
SFH 2500
SFH 2500 FA



SMR
SFH 2505
SFH 2505 FA



KOM 2125
KOM 2125 FA



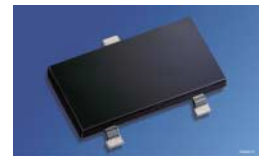
SMART DIL
SFH 2400
SFH 2400 FA



SMR
SFH 2500
SFH 2500 FA



SMR
SFH 2505
SFH 2505 FA

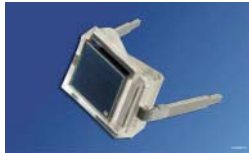


KOM 2125
KOM 2125 FA

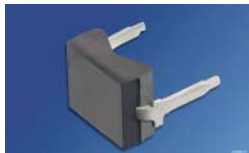
TYPENÜBERSICHT

SUMMARY OF TYPES

2.2.PIN Fotodioden im Plastikgehäuse



BPW 34
BPW 34 F / BPW 34 FA / BP 104 F



SFH 206 K



SFH 229
SFH 229 FA



SFH 203 / SFH 213 / SFH 214
SFH 203 FA / SFH 213 FA /
SFH 214 FA



SFH 203 P
SFH 203 PFA



SFH 225 FA / SFH 235 FA



SFH 205 F / SFH 205 FA



SFH 204 F / SFH 204 FA



2.3.PIN Fotodiode im Metallgehäuse

2.3.PIN Photodiode in metal package



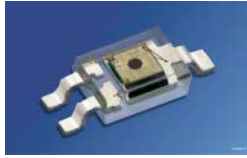
BPX 65

TYPENÜBERSICHT

SUMMARY OF TYPES

3. Foto ICs

3.1.Schmitt Trigger



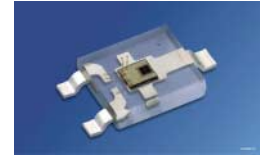
SMART DIL
SFH 5440
SFH 5441



SFH 5140 F
SFH 5141 F



SFH 5840
SFH 5841



SFH 5400

3.2.Linear Verstärker mit Spannungsausgang



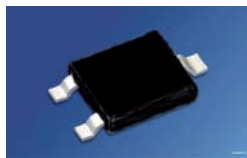
SFH 5130
SFH 5133

3.2. Linear amplifier with voltage output

3.3.Foto IC für Fernsteuerung



SFH 5110



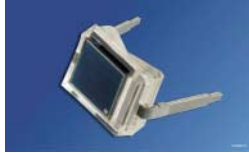
SFH 5410

3.3.Photo IC for remote control

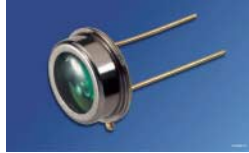
TYPENÜBERSICHT

SUMMARY OF TYPES

4. Fotodetektoren für spezielle Anwendungen



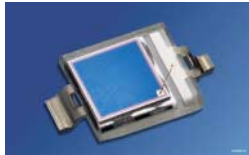
BPW 34 B



BPW 21 / BPX 61



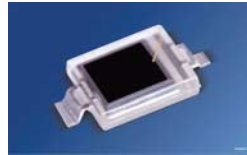
Ambient Light Sensor
SFH 3410



BPW 34 BS
SFH 221



BPX 48
BPX 48 F



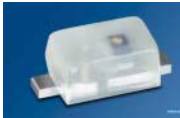
Ambient Light Sensor
SFH 2430

1. Fototransistoren

 $T_A = 25\text{ °C}$

1. Phototransistors

 $T_A = 25\text{ °C}$

Package	Type	φ deg.	Radiant sensitive area mm ²	I_{PCE} ($E_e = 0.1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_{CE} = 5\text{ V}$) μA	V_{CE} V	$\lambda_{10\%}$ nm	t_r, t_f ($I_C = 1\text{ mA}$, $V_{CC} = 5\text{ V}$, $R_L = 1\text{ k}\Omega$) μs	Ordering code	Fig. No.		
1.1 SMT Transistoren											
1.1 SMT Transistors											
 SmartLED®	SFH 3010	± 80	0.04	>25 (0.5 mW/cm^2)	30	420 ... 1100	7	Q65110A2652	69		
 TOPLED®	SFH 320	± 60	0.045	≥ 16	35		—	Q65110A2471	2		
	SFH 320-3			25 ... 50				7		Q65110A2469	
	SFH 320-3/4			25 ... 80				7/8		Q65110A1781	
	SFH 320-4			40 ... 80				8		Q65110A2510	
 TOPLED®	SFH 320 FA	± 60		≥ 16		740 ... 1100	—	Q65110A2472		2	
	SFH 320 FA-3			25 ... 50				7			Q65110A2470
	SFH 320 FA-3/4			25 ... 80				7/8			Q65110A2475
	SFH 320 FA-4			40 ... 80				8			Q65110A1836
 TOPLED® with Lens	SFH 3219	± 25		≥ 63		430...1150	7	Q65110A2529		67	
 TOPLED® RG	SFH 3211	± 60		≥ 16		420 ... 1100	8	Q65110A2525		3	
	SFH 3211-3/4			25 ... 80				Q65110A2527			
 TOPLED® RG	SFH 3211 FA	± 60		≥ 16		740 ... 1100	—	Q65110A2526		4	
	SFH 3211 FA-3/4		25 ... 80	7/8	Q65110A2528						
 SIDELED®	SFH 325	± 60	≥ 16	420 ... 1100	—	Q65110A2486	4				
	SFH 325-3		25 ... 50			7		Q65110A2488			
	SFH 325-3/4		25 ... 80			7/8		Q65110A2491			
	SFH 325-4		40 ... 80			8		Q65110A2484			
 SIDELED®	SFH 325 FA	± 60	≥ 16	740 ... 1100	—	Q65110A2487	4				
	SFH 325 FA-3		25 ... 50			7		Q65110A2482			
	SFH 325 FA-3/4		25 ... 80			7/8		Q65110A2490			
	SFH 325 FA-4		40 ... 80			8		Q65110A2485			
 Micro SIDELED®	SFH 3204	± 60	0.04	> 32	30	450...1120	7	Q65110A2506	108		

Package	Type	ϕ	Radiant sensitive area	I_{PCE} ($\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$)	V_{CE}	$\lambda_{10\%}$	t_r, t_f ($I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$) μs	Ordering code	Fig.
		deg.	mm^2	mA	V	nm			No.

1.1 SMT Transistoren (Forts.)

1.1 SMT Transistors (cont'd)

	SFH 3500			2.5 ... 20.0				Q65110A2636	7
T1 3/4 SMR						450 ... 1060	—		
	SFH 3505			2.5 ... 20.0			—	Q65110A2639	
	SFH 3505-3/4			2.5 ... 8.0			14/17	Q65110A2646	8
T1 3/4 SMR	SFH 3505-5/6	± 13		6.3 ... 20.0			20/24	Q65110A2647	
	SFH 3500 FA			2.5 ... 20.0			—	Q65110A2637	7
T1 3/4 SMR	SFH 3500 FA-5/6			6.3 ... 20.0			20/24	Q65110A2645	
	SFH 3505 FA			2.5 ... 20.0			—	Q65110A2640	8
T1 3/4 SMR	SFH 3505 FA-5/6			6.3 ... 20.0			20/24	Q65110A2780	
	SFH 3400			0.063 ... 0.32			—	Q65110A2629	9
	SFH 3400-2/3			0.1 ... 0.32			24/34	Q65110A2634	
	SFH 3401 (mit Basisanschluß/ with base connection)			0.063 ... 0.32			—	Q65110A2635	10
SmartDIL	SFH 3401-2/3	± 60		0.1 ... 0.32			24/34	Q65110A2644	
	SFH 3201			0.063 ... 0.32			—	Q65110A1207	11
	SFH 3201-2/3			0.1 ... 0.32			24/34	Q65110A2479	

1.1.1 SMT Transistoren in flachem, engwinkligem MIDLED Gehäuse

1.1.1 SMT Transistors in low profile, narrow angle MIDLED package

	SFH 3600			>63				Q65110A1573	
	SFH 3600-2/3			100 ... 320				Q65110A2665	
MIDLED	SFH 3600-3/4	± 20	0.04	160 ... 500				Q65110A2666	91
	SFH 3605			>63				Q65110A2663	
	SFH 3605-2/3			100 ... 320				Q65110A2664	
MIDLED	SFH 3605-3/4			160 ... 500				Q65110A1574	

1.1.2 Empfänger/Sender im Multi TOPLED Gehäuse

1.1.2 Detector/Emitter in Multi TOPLED package

Package	Type		λ_{peak} nm	φ deg.	I_V ($I_F = 20 \text{ mA}$) mcd	V_F ($I_F = 20 \text{ mA}$) V	Ordering code	Fig. No.
 Multi TOPLED®	SFH 331-JK	Emitter	635	± 60	4...12.5	2.0	Q65110A1206	5
		Detector	Radiant sensitive area mm ²	I_{PCE} ($E_e = 0.1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$) μA	V_{CEO} V	$\lambda_{10\%}$ nm		
			0.045	≥ 16	35	380... 1150		

Package	Type		λ_{peak} nm	φ deg.	I_e ($I_F = 100 \text{ mA}$) mW/sr	V_F ($I_F = 100 \text{ mA}$) V	Ordering code	Fig. No.
 Multi TOPLED®	SFH 7221	Emitter	880	± 60	4	1.5	Q65110A2741	6
		Detector	Radiant sensitive area mm ²	I_{PCE} ($E_e = 0.1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$) μA	V_{CE} V	$\lambda_{10\%}$ nm		
			0.045	≥ 16	35	380... 1150		

Package	Type		λ_{peak} nm	φ deg.	I_V ($I_F = 20 \text{ mA}$) mcd	V_F ($I_F = 20 \text{ mA}$) V	Ordering code	Fig. No.
 Multi TOPLED®	SFH 7225	Emitter	591	± 60	63...200	2.0	Q65110A2743	5
		Detector	Radiant sensitive area mm ²	I_{PCE} ($E_e = 1000 \times$ Standard light A $V_{CE} = 5 \text{ V}$) μA	V_{CE} V	Crosstalk I_{PCE} ($I_F = 20 \text{ mA}$, $V_{CE} = 5 \text{ V}$) μA		
			0.045	650 typ.	35	> 0.5		

Package	Type		λ_{peak} nm	φ deg.	I_V ($I_F = 20 \text{ mA}$) mcd	V_F ($I_F = 20 \text{ mA}$) V	Ordering code	Fig. No.
 Multi TOPLED®	SFH 7226	Emitter	645	± 60	40...125	2.0	Q65110A2744	5
		Detector	Radiant sensitive area mm ²	I_{PCE} ($E_e = 1000 \times$ Standard light A $V_{CE} = 5 \text{ V}$) μA	V_{CE} V	Crosstalk I_{PCE} ($I_F = 20 \text{ mA}$, $V_{CE} = 5 \text{ V}$) μA		
			0.045	650 typ.	35	> 2		

Package	Type	φ deg.	Radiant sensitive area mm ²	I_{PCE} ($\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$) mA	V_{CE} V	$\lambda_{10\%}$ nm	t_r, t_f ($I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$) μs	Ordering code	Fig. No.
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1.1.3 SMT Transistor mit V_A - Kurve

1.1.3 SMT Transistor with V_A - Curve

 SmartDIL	SFH 3410	± 60	0.29	>0.0032	$E_V = 20 \text{ lx}$, standard light A	5.5	350 ... 970	—	Q65110A1211	12
	SFH 3410-1/2			0.0032-0.010					Q65110A2653	
	SFH 3410-2/3			0.005 -0.016					Q65110A2654	
	SFH 3410-3/4			0.008 -0.025					Q65110A2655	

Package	Type	ϕ deg.	Radiant sensitive area mm ²	I_{PCE} ($E_e=0,5$ mW/cm ² , $\lambda = 950$ nm, $V_{CE} = 5$ V) mA	V_{CE} V	$\lambda_{10\%}$ nm	t_r, t_f ($I_C = 1$ mA, $V_{CC} = 5$ V, $R_L = 1$ k Ω) μ s	Ordering code	Fig. No.
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1.2 Fototransistoren im Plastikgehäuse

1.2 Phototransistors in plastic package

1.2.1 Klares Plastikgehäuse

1.2.1 Clear plastic package

 T 1	SFH 309	± 12	0.045	≥ 0.4	35	380 ... 1080	–	Q62702P0859	23
	SFH 309-3/4			0.63 ... 2.0			6/7	Q62702P3592	
	SFH 309-4			1.0 ... 2.0			7	Q62702P0998	
	SFH 309-4/5			1.0 ... 3.2			7/8	Q62702P3593	
	SFH 309-5			1.6 ... 3.2			8	Q62702P0999	
	SFH 309-5/6			≥ 1.6			8/9	Q62702P3594	
	SFH 310	± 25	0.19	≥ 0.4	70		–	Q62702P0874	24
SFH 310-2/3	0.63 ... 2.0			7/8			Q62702P3595		
 T 1	SFH 309 P	± 75	0.045	≥ 0.063	35		8	Q62702P0245	25
 T 1¼	SFH 313	± 10	0.55	≥ 2.5	50	450 ... 1100	–	Q62702P1667	26
	SFH 313-2/3			4.0 ... 12.5			10/12	Q62702P3598	
	SFH 314	± 40		≥ 0.63			–	Q62702P1668	27
	SFH 314-2/3			1.0 ... 3.2			10/12	Q62702P3600	
	SFH 300	± 25	0.12	≥ 0.63	35	420 ... 1130	–	Q62702P1189	28
	SFH 300-3/4			≥ 1.0			10	Q62702P3586	
 T 1¼	SFH 303	± 20	0.2	≥ 1.0	50	450 ... 1100	–	Q62702P0957	29
	SFH 303-3/4			≥ 1.6			13/15	Q62702P3588	
	LPT 80 A	± 35	0.3	≥ 0.25	30	400 ... 1100	10	Q68000A7852 ¹⁾	30

¹⁾ conversion to RoHS compliance 03/2005

1.2.2 Plastikgehäuse mit Tageslichtfilter für 880/950 nm IRED

1.2.2 Plastic package with daylight-filter for 880/950 nm IRED

 T 1	SFH 309 FA	± 12	0.045	≥ 0.4	35	730 ... 1100	–	Q62702P0941	23
	SFH 309 FA-3/4			0.63 ... 2.0			6/7	Q62702P3590	
	SFH 309 FA-4			1.0 ... 2.0			7	Q62702P0178	
	SFH 309 FA-4/5			1.0 ... 3.2			7/8	Q62702P3591	
	SFH 309 FA-5			1.6 ... 3.2			8	Q62702P0180	
	SFH 309 FA-5/6			1.6 ... 5.0			8/9	Q62702P5199	
	SFH 310 FA	± 25	0.19	≥ 0.4	70		–	Q62702P1673	24
	SFH 310 FA-2/3			0.63 ... 2.0			7/8	Q62702P3596	

Package	Type	ϕ	Radiant sensitive area	I_{PCE} ($E_e=0,5 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$) mA	V_{CE}	$\lambda_{10\%}$	t_r, t_f ($I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$) μs	Ordering code	Fig.
		deg.	mm ²		V	nm			No.

1.2.2 Plastikgehäuse mit Tageslichtfilter für 880/950 nm IRED

1.2.2 Plastic Package with daylight-filter for 880/950 nm IRED

 T 1	SFH 309 PFA	± 75	0.045	≥ 0.063	35	730 ... 1100	—	Q62702P0246	25	
 T 1 1/4	SFH 313 FA	± 10	0.55	≥ 2.5	50		—	Q62702P1674	26	
	SFH 313 FA-2/3			4.0 ... 12.5			10/12	Q62702P3597		
	SFH 313 FA-3/4			≥ 6.3			12/14	Q62702P5196		
	SFH 314 FA	± 40		≥ 0.63			—	Q62702P1675	27	
	SFH 314 FA-2/3			1.0 ... 3.2			10/12	Q62702P3599		
T 1 1/4	SFH 300 FA	± 25	0.12	≥ 0.63	35		—	Q62702P1193	28	
	SFH 300 FA-3/4			≥ 1.0			10	Q62702P3585		
 T 1 1/4	SFH 303 FA	± 20	0.2	≥ 1.0	50		—	Q62702P0958	29	
	SFH 303 FA-3/4			≥ 1.6			13/15	Q62702P3587		
	SFH 3100 F	± 14	0.11	> 0.4	30		840 ... 1080	7/9	Q62702P5073 ¹⁾	31

¹⁾ conversion to RoHS compliance 03/2005

Package	Type	ϕ	Radiant sensitive area	$I_{CE(ON)}$ ($E_e=0,34 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 3,5 \text{ V}$) mA	V_{CE}	$\lambda_{10\%}$	t_r, t_f ($I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$) μs	Ordering code	Fig.
		deg.	mm ²		V	nm			No.

1.2.3 Doppel Fototransistor

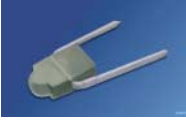
1.2.3 Dual Phototransistor

	SFH 3160 F	± 75	2x0.068	90 ... 290	30	780 ... 1100	7/9	Q62702P5296	100
	SFH 3162 F		2x0.15	185 ... 585			11/11	Q62702P5297	101
	SFH 3163 F		2x0.15	186 ... 585			11/11	Q65110A0353	102

Package	Type	φ	Radiant sensitive area	I_{PCE} ($E_e=0,5 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$) mA	V_{CE}	$\lambda_{10\%}$	t_r, t_f ($I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$) μs	Ordering code	Fig.
		deg.	mm ²		V	nm			No.

1.2.4 Zeilen im Plastikgehäuse

1.2.4 Arrays in plastic package

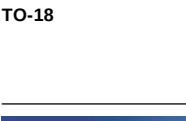
	SFH 305	± 16	0.17	≥ 0.25	32	440 ... 1070	—	Q62702P0836 ¹⁾	35
	SFH 305-2/3			0.25 ... 0.8			5.5/6	Q62702P3589 ¹⁾	
	BPX 81	± 18	0.17	≥ 0.25	32	440 ... 1070	—	Q62702P0020 ¹⁾	36
	BPX 81-2/3			0.2 ... 0.8			5.5/6	Q62702P3583 ¹⁾	
	BPX 81-3			0.4 ... 0.8			6	Q62702P0043S003 ¹⁾	
	BPX 81-3/4			≥ 0.4			6/8	Q62702P3584 ¹⁾	
	BPX 81-4			≥ 0.63			8	Q62702P0043S004 ¹⁾	
	BPX 82	± 18	2 × 0.17	≥ 0.25	32	440 ... 1070	6	Q62702P0021 ¹⁾	37
	BPX 83		3 × 0.17					Q62702P0025 ¹⁾	
	BPX 84		4 × 0.17					Q62702P0030 ¹⁾	
	BPX 85		5 × 0.17					Q62702P0031 ¹⁾	
	BPX 86		6 × 0.17					Q62702P0022 ¹⁾	
	BPX 87		7 × 0.17					Q62702P0032 ¹⁾	
	BPX 88		8 × 0.17					Q62702P0033 ¹⁾	
	BPX 89		9 × 0.17					Q62702P0026 ¹⁾	
	BPX 80		10 × 0.17					Q62702P0028 ¹⁾	

¹⁾ conversion to RoHS compliance 03/2005

Package	Type	φ	Radiant sensitive area	I_{PCE} ($E_e = 0.5 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$) μA	V_{CE}	$\lambda_{10\%}$	t_r, t_f ($I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$) μs	Ordering code	Fig.
		deg.	mm ²		V	nm			No.

1.3 Fototransistoren im Metallgehäuse

1.3 Phototransistors in metal package

	BPY 62	± 8	0.12	0.5 ... 2.5	50	420 ... 1130	—	Q60215Y0062	32
	BPY 62-3			0.8 ... 1.6			7	Q60215Y1112	
	BPY 62-3/4			0.8 ... 2.5			7/9	Q62702P5198	
	BPY 62-4			1.25 ... 2.5			9	Q60215Y1113	
	BPX 43	± 15	0.675	≥ 0.8	50	450 ... 1100	—	Q62702P0016	32
	BPX 43-3/4			1.25 ... 4.0			12/14	Q62702P3581	
	BPX 43-4			2.0 ... 4.0			15	Q62702P0016S004	
	BPX 43-4/5			≥ 2.0			15/18	Q62702P3582	
	BPX 43-5	± 40	0.675	≥ 3.2	50	450 ... 1120	18	Q62702P0016S005	33
	BPX 38			≥ 0.2			—	Q62702P0015	
	BPX 38-2/3			0.2 ... 0.63			9/12	Q62702P3578	
	BPX 38-3			0.32 ... 0.63			12	Q62702P0015S003	
	BP 103	± 55	0.12	≥ 0.08	50	420 ... 1130	—	Q62702P0075	34
	BP 103-3/4			0.125 ... 0.4			7/9	Q62702P3577	

2. Fotodioden

2. Photodiodes

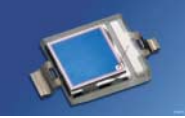
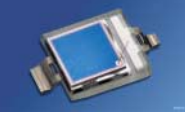
Package	Type	ϕ deg.	Radiant sensitive area mm ²	I_P ($E_v = 1000 \text{ lx}$, standard light A, $V_R = 5 \text{ V}$) μA	I_R ($V_R = 10 \text{ V}$) nA	$\lambda_{10\%}$ nm	t_r, t_f ($V_R = 20 \text{ V}$, $R_L = 50 \Omega$) ns	Ordering code	Fig. No.
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2.1 SMT Fotodioden

2.1 SMT Photodiodes

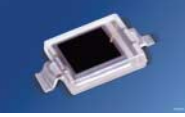
2.1.1 SMT PIN Fotodioden in klarem Gehäuse

2.1.1 SMT PIN Photodiodes in clear package

 SMT DIL	BP 104 S		2.2 × 2.2	55 (≥ 40)				Q65110A2626	13
	BPW 34 S							Q65110A1209	14
 SMT DIL	BPW 34 S R18R	± 60	2.65 × 2.65	80 (≥ 50)	2 (≤ 30)	400 ... 1100	5	Q65110A2701	15
 SMT DIL	BPW 34 BS			14.8 (>10.8) ($E_e = 1 \text{ mW/cm}^2$, $\lambda = 400 \text{ nm}$, $V_R = 5 \text{ V}$)		30% (400 nm)	25	Q65110A2625	14
 Smart DIL	SFH 2400	± 60		10 (> 5.5)				Q65110A2628	16
 T 1 3/4 SMR	SFH 2500		1 × 1		1 (≤ 5) ($V_R = 20 \text{ V}$)	400 ... 1100	5	Q65110A1201	7
 T 1 3/4 SMR	SFH 2505	± 15		70 (> 50) ($\lambda = 870 \text{ nm}$, $E_e = 1 \text{ mW/cm}^2$)				Q65110A1203	8

Package	Type	ϕ deg.	Radiant sensitive area mm ²	I_P ($E_v = 1000 \text{ lx}$, standard light A, $V_R = 5 \text{ V}$) μA	I_R ($V_R = 5 \text{ V}$) nA	$\lambda_{10\%}$ nm	t_r, t_f ($V_R = 5 \text{ V}$, $R_L = 50 \text{ k}\Omega$) μs	Ordering code	Fig. No.
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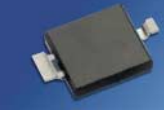
2.1.2 SMT PIN Fotodioden mit V_λ -Kurve2.1.2 SMT PIN Photodiodes with V_λ -Curve

 SMT DIL	SFH 2430	± 60	2.65 × 2.65	5.8 (>4)	0.1(≤ 5)	400 ... 900	200	Q65110A2673	14
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Package	Type	ϕ deg.	Radiant sensitive area mm ²	I_P ($E_e = 1 \text{ mW/cm}^2$, $V_R = 5 \text{ V}$) μA	I_R ($V_R = 10 \text{ V}$) nA	$\lambda_{10\%}$ nm	t_r, t_f ($V_R = 20 \text{ V}$, $R_L = 50 \Omega$) ns	Ordering code	Fig. No.
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2.1.3 SMT PIN Fotodioden mit Tageslichtfilter

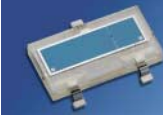
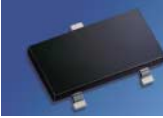
2.1.3 SMT PIN Photodiodes with daylight-filter

 SMT DIL	BP 104 FS	± 60	2.2×2.2	$34 (\geq 25)$	950	$2 (\leq 30)$	800 ... 1100	10	Q65110A2627	13
	BP 104 FAS								Q65110A2672	
	BPW 34 FS								Q65110A2700	14
	BPW 34 FAS								Q65110A1210	
 SMT DIL	BPW 34 FS R18R	± 60	2.65×2.65	$50 (\geq 40)$	950	$2 (\leq 30)$	800 ... 1100	10	Q65110A2740	15
	BPW 34 FAS R18R								Q65110A2699	
 Smart DIL	SFH 2400 FA	± 15	1×1	$6.2 (\geq 3.6)$	$\lambda = 870 \text{ nm}$	$1 (\leq 5)$ ($V_R = 20 \text{ V}$)	750 ... 1100	5	Q65110A2638	16
 T 1 3/4 SMR	SFH 2500 FA								Q65110A1202	7
 T 1 3/4 SMR	SFH 2505 FA								Q65110A1204	8

Package	Type	ϕ deg.	Radiant sensitive area mm ²	I_P ($E_e = 1000 \text{ lx}$, $V_R = 5 \text{ V}$) μA	I_R ($V_R = 10 \text{ V}$) nA	$\lambda_{10\%}$ nm	t_r, t_f ($V_R = 10 \text{ V}$, $R_L = 50 \Omega$) ns	Ordering code	Fig. No.
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2.1.4 SMT Doppelfotodiode

2.1.4 SMT Dual photodiodes

	KOM 2125	± 60	4 (diode A) 10 (diode B)	40 (≥ 30) diode A 100 (≥ 75) diode B		5 (≤ 30) diode A 10 (≤ 30) diode B	400 ... 1100	13 diode A 20 diode B	Q65110A2703	17
	KOM 2125 FA			26 (≥ 20) diode A, 70 (≥ 50) diode B	$\lambda = 870 \text{ nm},$ $E_e = 1 \text{ mW/cm}^2$		750 ... 1100		Q65110A2702	

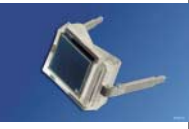
Package	Type	ϕ deg.	Radiant sensitive area mm ²	I_P ($E_v = 1000 \text{ lx}$, standard light A, $V_R = 5 \text{ V}$) μA	I_R ($V_R = 10 \text{ V}$) nA	$\lambda_{10\%}$ nm	t_r, t_f ($V_R = 20 \text{ V}$, $R_L = 50 \Omega$) ns	Ordering code	Fig. No.
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2.2 PIN Fotodioden im Plastikgehäuse

2.2 PIN photodiodes in plastic package

2.2.1 Klares Plastikgehäuse

2.2.1 Clear plastic package

 DIL	BPW 34	± 60						Q62702P0073 ¹⁾	39
 TO-92	SFH 206 K	± 60	2.65×2.65	$80 (\geq 50)$	$2 (\leq 30)$	$400 \dots 1100$	10	Q62702P0129	41
 T 1	SFH 229	± 17	0.56×0.56	$28 (\geq 18)$	$0.05 (\leq 5)$	$380 \dots 1100$		Q62702P0215	23
 T 1 3/4	SFH 203	± 20		$80 (\geq 50)$				Q62702P0955	42
	SFH 213	± 10		$135 (\geq 100)$				Q62702P0930	26
 T 1 3/4	SFH 203 P	± 75	1×1	$9.5 (\geq 5)$	$1 (\leq 10)$ ($V_R = 20 \text{ V}$)	$400 \dots 1100$	5	Q62702P0942	43

¹⁾ conversion to RoHS compliance 03/2005

Package	Type	ϕ	Radiant sensitive area	I_P ($E_e = 1 \text{ mW/cm}^2$, $\lambda = 870 \text{ nm}$, $V_R = 5 \text{ V}$)	I_R ($V_R = 10 \text{ V}$)	$\lambda_{10\%}$	t_r, t_f ($V_R = 20 \text{ V}$, $R_L = 50 \Omega$)	Ordering code	Fig.
		deg.	mm ²	μA	nA	nm	ns		No.

2.2.2 Gehäuse mit Tageslichtfilter für 880 nm IRED

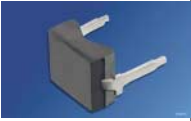
2.2.2 Package with daylight filter matched for 880 nm IRED

	SFH 225 FA	± 60	2.2×2.2	$34 (\geq 25)$				Q62702P1051	44
TO 92	SFH 235 FA	± 65		$50 (\geq 40)$				Q62702P0273	44
	SFH 205 FA		2.65×2.65	$60 (\geq 45)$	$2 (\leq 30)$		10	Q62702P1677	45
TO 92		± 60							
	BPW 34 FA			$50 (\geq 40)$		740 ... 1100		Q62702P1129 ¹⁾	39
DIL									
	SFH 229 FA	± 17	0.56×0.56	$40 (\geq 22)$	$0.5 (\leq 5)$			Q62702P0216	23
T 1									
	SFH 203 FA	± 20		$100 (\geq 60)$				Q62702P0956	42
T 1 3/4	SFH 213 FA	± 10		$90 (\geq 65)$		750 ... 1100	5	Q62702P1671	26
			1×1		$1 (\leq 10)$ ($V_R = 20 \text{ V}$)				
	SFH 203 PFA	± 75		$6.2 (\geq 3.6)$				Q62702P0947	43
T 1 3/4									
	SFH 204 FA	± 60	2.2×2.2	$52 (\geq 43)$	$2 (\leq 30)$	740 ... 1100	10	Q62702P1793	46
TO 92									

¹⁾ conversion to RoHS compliance 03/2005

Package	Type	φ	Radiant sensitive area	I_P ($E_e = 1 \text{ mW/cm}^2$, $\lambda = 870 \text{ nm}$, $V_R = 5 \text{ V}$) μA	I_R ($V_R = 10 \text{ V}$) nA	$\lambda_{10\%}$ nm	t_r, t_f ($V_R = 20 \text{ V}$, $R_L = 50 \Omega$) ns	Ordering code	Fig.
		deg.	mm^2						No.

2.2.3 Gehäuse mit Tageslichtfilter für 950 nm IRED
2.2.3 Package with daylight filter matched for 950 nm IRED

 DIL	BP 104 F	± 60	2.2×2.2	$34 (\geq 25)$	$2 (\leq 30)$	$800 \dots 1100$	10	$Q62702P0084^{1)}$	47
	BPW 34 F			$50 (\geq 40)$				$Q62702P0929^{1)}$	39
 TO 92	SFH 205 F		2.65×2.65	$60 (\geq 45)$				$Q62702P0102$	45
 TO 92	SFH 204 F		2.2×2.2	$52 (\geq 43)$		$780 \dots 1120$		$Q62702P5052$	46

¹⁾ conversion to RoHS compliance 03/2005

Package	Type	φ	Radiant sensitive area	I_P ($V_R = 5 \text{ V}$, $E_v = 1000 \text{ lx}$, standard light A) μA	I_R ($V_R = 10 \text{ V}$) nA	$\lambda_{10\%}$ nm	t_r, t_f ($V_R = 20 \text{ V}$, $R_L = 50 \Omega$) ns	Ordering code	Fig.
		deg.	mm^2						No.

2.3 PIN Fotodioden im Metallgehäuse
2.3 PIN photodiodes in metal package

 TO 18	BPX 65	± 40	1×1	$10 (\geq 5.5)$	$1 (\leq 5)$	$350 \dots 1100$	5	$Q62702P0027$	49
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¹⁾ conversion to RoHS compliance 03/2005

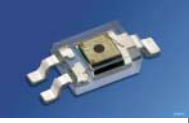
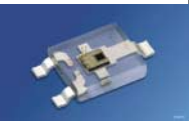
3. Foto ICs

3. Photo ICs

Package	Type	φ deg.	V_{CC} V	Switching threshold E_e ($V_{CC} = 5\text{ V}$) mW/cm^2	$\lambda_{10\%}$ nm	I_O mA	$t_{PHL}/$ t_{PLH} μs	Ordering code	Fig. No.
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3.1 Schmitt Trigger IC

3.1 Schmitt Trigger IC

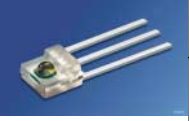
	SFH 5440	± 60	4 ... 18	0.170 (< 0.320)	$\lambda = 950\text{ nm}$	400 ... 1100	< 16	5 (< 15)	Q65110A1212	18
	SFH 5441								Q65110A2641	
	SFH 5140 F	± 14	4 ... 18	0.015 (< 0.05)	$\lambda = 950\text{ nm}$	840 ... 1080	< 16	5 (< 15)	Q62702P5112 ¹⁾	19
	SFH 5141 F								Q62702P5113 ¹⁾	
	SFH 5840	± 10	4 ... 18	0.01 (< 0.032)	$\lambda = 950\text{ nm}$	400 ... 1100	< 16	5 (< 15)	Q62702P5116	20
	SFH 5841								Q62702P5117	
	SFH 5400	± 60	4.5 ... 15	1.3 (< 3.2)	$\lambda = 660\text{ nm}$	500 ... 900	- 25 ... 25	0.2	Q65110A2704	21

¹⁾ conversion to RoHS compliance 03/2005

Package	Type	φ deg.	V_{CC} V	Irradiance Responsivity N_e ($V_{CC} = 5\text{ V}$) $\text{mV}/\mu\text{W/cm}^2$	$\lambda_{10\%}$ nm	I_{CC} mA	Ordering code	Fig. No.
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3.2 Linearer Verstärker mit Spannungsausgang

3.2 Linear amplifier with voltage output

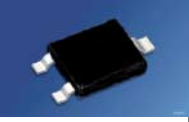
	SFH 5130	± 40	4.5 ... 5.5	1180	$\lambda = 430\text{ nm}$	350 ... 1100	1.5	Q62702P5406 ¹⁾	103
	SFH 5133	horizontal: ± 35 vertikal: ± 55		570		350 ... 950		Q62702P5547 ¹⁾	104

¹⁾ conversion to RoHS compliance 03/2005

Package	Type	Frequenz kHz	φ deg.	min threshold irradiance $E_{e\text{ min}}$ mW/cm^2	Ordering code	Fig. No.
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3.3 Foto IC für Fernsteuerung

3.3 Photo IC for remote control

	SFH 5110-30	30	horizontal: ± 50 vertikal: ± 30	0.35 typ.	Q62702P5088 ¹⁾	1
	SFH 5110-33	33			Q62702P5089 ¹⁾	
	SFH 5110-36	36			Q62702P5090 ¹⁾	
	SFH 5110-38	38			Q62702P5091 ¹⁾	
	SFH 5110-40	40			Q62702P5092 ¹⁾	
	SFH 5410	38	± 60	1.4 typ.	Q65110A2656	105

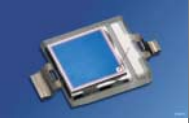
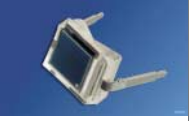
¹⁾ conversion to RoHS compliance 03/2005

4. Fotodetektoren für spezielle Anwendungen 4. Photodetectors for special applications

Package	Type	φ deg.	Radiant sensitive area mm ²	I_P μA	I_R ($V_R = 10$ V) nA	$S_{\lambda, \text{rel}}$ %	t_r, t_f ($V_R = 5$ V) μs	Ordering code	Fig. No.
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4.1 Blauempfindliche Fotodiode

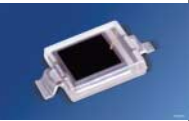
4.1 Blue sensitive photodiode

	BPW 34 BS	± 60	7.45	14.8 (> 10.8) $E_s = 1$ mW/cm ² $\lambda = 400$ nm $V_R = 5$ V	2 (≤ 30)	30% (400 nm)	25 ($R_L = 50$ Ω) $\lambda = 850$ nm	Q65110A2625	14
	BPW 34 B							Q62702P0945 ¹⁾	39

¹⁾ conversion to RoHS compliance 03/2005

4.2 Fotodetektoren für den sichtbaren Bereich

4.2 Photodetectors for the visible range

Fotodiode mit V_{λ} -Kurve				Photodiode with V_{λ} -Curve					
	BPW 21	± 55	2.73 × 2.73 $V_R = 5$ V	10 (> 5.5) ($E_V = 1000$ lx standard light A)	8 (≤ 200) pA ($V_R = 1$ V)	100% (550 nm)	1.5 ($R_L = 1$ kΩ)	Q62702P0885	50
	SFH 2430	± 60	2.65 × 2.65	5.8 (> 4) ($E_V = 1000$ lx, standard light A)	0.1 (≤ 5)	400 ... 900	200	Q65110A2673	14
SMT DIL									

Package	Type	φ deg.	Radiant sensitive area mm ²	I_{PCE} ($V_{CE} = 5$ V $E_V = 20$ lx, standard light A) mA	V_{CE} V	$\lambda_{10\%}$ nm	t_r, t_f ($I_C = 1$ mA, $V_{CC} = 5$ V, $R_L = 50$ Ω) μs	Ordering code	Fig. No.
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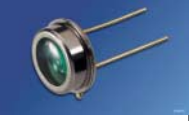
SMT Transistor mit V_{λ} -KurveSMT Transistor with V_{λ} -Curve

	SFH 3410	± 60	0.29	>0.0032	5.5	350 ... 970	-	Q65110A1211	12
	SFH 3410-1/2			0.0032 -0.010				Q65110A2653	
	SFH 3410-2/3			0.005 -0.016				Q65110A2654	
	SFH 3410-3/4			0.008 -0.025				Q65110A2655	

Package	Type	ϕ deg.	Radiant sensitive area mm ²	I_P ($E_v = 1000 \text{ lx}$, standard light A, $V_R = 5 \text{ V}$) μA	I_R ($V_R = 10 \text{ V}$) nA	$\lambda_{10\%}$ nm	t_r, t_f ($V_R = 5 \text{ V}$) ns	Ordering code	Fig. No.
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4.3 Großflächige PIN Fotodiode

4.3 Large area PIN photodiode

	BPX 61	± 55	2.65×2.65	$70 (\geq 50)$	$2 (\leq 30)$	400 ... 1100	20 ($R_L = 50 \Omega$)	Q62705P0025	50
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4.4 Doppelfotodioden

4.4 Dual photodiodes

	SFH 221	± 55	2 times 2.2 × 0.7	24 (≥ 15)	10 (≤ 100)	400 ... 1100	500 (R _L = 1 kΩ)	Q62702P0270	51
	BPX 48	± 60		24 (≥ 15)		400 ... 1150	500 (R _L = 1 kΩ)	Q62702P0017 ¹⁾	52
	BPX 48F			7.5 (≥ 4.0) E _e = 0.5 mW/cm ² λ = 950 nm		750 ... 1150	500 (R _L = 1 kΩ)	Q62702P0305 ¹⁾	

¹⁾ conversion to RoHS compliance 03/2005

TYPENÜBERSICHT

SUMMARY OF TYPES

1. Gabellichtschranken

1. Slotted Interrupters



SFH 9300



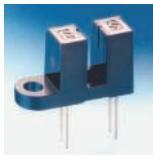
SFH 9301



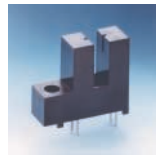
SFH 9302



SFH 9303



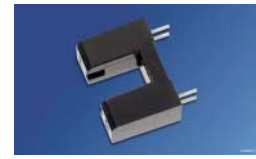
SFH 9304



SFH 9305



SFH 9306



SFH 9310



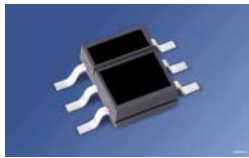
SFH 9340
Schmitt Trigger



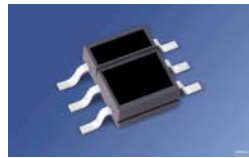
SFH 9500

2. SMT Reflexlichtschranken

2. SMT Reflective Sensors



SFH 9201 / SFH 9202
SFH 9210 / SFH 9221

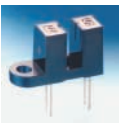


SFH 9240 / SFH 9241
Schmitt Trigger

Package	Type	Features	Slot width mm	Aperture slit width on emitter/sen- sor side mm	I_{CE} ($I_F = 20$ mA, $V_{CE} = 5$ V) mA	I_{CEO} ($I_F = 0$, $V_{CE} = 20$ V) nA	V_F ($I_F = 20$ mA) V	Ordering code	Fig.
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1. Gabellichtschranken

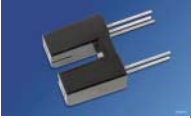
1. Slotted Interrupters

	SFH 9300	no aperture slits, high current transfer ratio	3.65	– / –	> 1	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5019	54
	SFH 9301	with vertical aperture slits, high resolution	3.18	1.27 / 0.25	> 0.7	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5083	55
	SFH 9302	with vertical aperture slits, two mounting tabs	3.18	1.27 / 0.25	> 0.7	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5084	56
	SFH 9303	with vertical aperture slits, mounting tab on sensor side	3.18	1.27 / 0.25	> 0.7	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5085	57
	SFH 9304	with vertical aperture slits, mounting tab on emitter side	3.18	1.27 / 0.25	> 0.7	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5086	58
	SFH 9305	with vertical aperture slits, mounting tab on sensor side, locating pins	3.28	0.5 / 0.5	> 0.7	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5129	59
	SFH 9306	with vertical aperture slits, locating pins	3.18	1.27 / 0.25	> 0.7	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5130	60
	SFH 9310	horizontal slits	5.00	0.5 / 0.5	> 0.7	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5214	61
	SFH 9500	with vertical aperture slits, SMT version, suitable for reflow soldering, locating pins	5.00	0.5 / 0.5	> 1	2 (≤ 50)	1.2 (≤ 1.4)	Q62702P5066	63

Package	Type	Features	Slot width mm	Aperture slit width on emitter/sensor side mm	V_{CC} V	Threshold input current $I_{F, ON}$ mA	Hysteresis $I_{F, OFF} / I_{F, ON}$	Propagation delay time t_{PHL}, t_{PLH} ($R_L = 280 \Omega$, $V_{CC} = 5 V$, $I_F = 4 mA$) μs	V_F ($I_F = 20 mA$) V	Ordering code	Fig.
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1. Gabellichtschranken (Forts.)

1. Slotted Interrupters (cont'd)

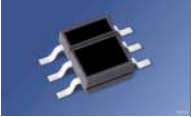
	SFH 9340	Schmitt Trigger output, SFH 9340 active "low"	3.18	1.27 / 0.25	4 ... 18	0.6 (< 2)	0.6	2	1.2 (≤ 1.4)	Q62702P5120	64
	SFH 9341	Schmitt Trigger output, SFH 9341 active "high"								Q62702P5121	

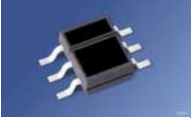
Package	Type	I_{CE} ($I_F = 10 mA$, $V_{CE} = 5 V$, $d = 1 mm$) mA	I_{CEO} ($V_{CE} = 20 V$) nA	$V_{CE max}$ V	V_F ($I_F = 50 mA$) V	Ordering code	Fig.
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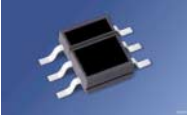
2. SMT Reflexlichtschranken

2. SMT Reflective Sensors

	SFH 9201	0.25 ... 2.00	3 (≤ 200)	30	1.25 (≤ 1.65)	Q65110A2708	65
	SFH 9201-2/3	0.40 ... 1.25				Q65110A2698	
	SFH 9201-3/4	0.63 ... 2.00				Q65110A2716	
	SFH 9202	0.063 ... 0.8	Q65110A2712				
	SFH 9202-2/3	0.063 ... 0.2	Q65110A2705				
	SFH 9202-3/4	0.10 ... 0.32	Q65110A2710				
	SFH 9202-4/5 SFH 9202-5/6	0.16 ... 0.50 0.25 ... 0.80	Q65110A2709 Q65110A2711				

Package	Type	Feature	I_{CE} ($I_F = 8 mA$, $V_{CE} = 5 V$, $d = 5 mm$) mA	I_{CEO} ($V_{CE} = 20 V$) nA	Threshold current I_{TH} mA	$V_{CE max}$ V	V_F ($I_F = 10 mA$) V	Ordering code	Fig.
	SFH 9210	VCSEL emitter	1 ... 8	3 (≤ 200)	2.6 (< 5)	16 30 ($\leq 2 min$)	1.8 (≤ 2.3)	Q65110A2713	65

Package	Type	Feature	I_P ($I_F = 8 mA$, $V_R = 5 V$, $d = 5 mm$) μA	I_R ($V_R = 10 V$) pA	Threshold current I_{TH} mA	V_F ($I_F = 10 mA$) V	Ordering code	Fig.
	SFH 9221	VCSEL emitter Photodiode output	> 1	50	2.6 (< 5)	1.8 (≤ 2.3)	Q65110A2706	65

Package	Type	Features	V_{CC} V	Threshold input current $I_{F, on}$ ($V_{CC} = 5\text{ V}$, $d = 1\text{ mm}$) mA	Hystere- sis $I_{F, OFF} /$ $I_{F, ON}$	Propagation delay time t_{PHL}, t_{PLH} ($R_L = 280\ \Omega$, $V_{CC} = 5\text{ V}$, $I_F = 20\text{ mA}$) ns	V_F ($I_F = 50\text{ mA}$) V	Ordering code	Fig.
	SFH 9240	Schmitt Trigger Output, active "low"	4 ... 18	3 (< 10)	0.6	2	1.25 (≤ 1.65)	Q65110A2714	65
	SFH 9241	Schmitt Trigger Output, active "high"						Q65110A2715	

TYPENÜBERSICHT

SUMMARY OF TYPES

1. Emitter in SMT



SmartLED®
SFH 4000 / SFH 4010
SFH 4020 / SFH 4080



TOPLED®
SFH 420 / SFH 4211 /
SFH 421 / SFH 4200



SFH 4257 / SFH 4271
SFH 4272 / SFH 4273



TOPLED® RG
SFH 4281



Mini TOPLED®
SFH 4203



SMR
SFH 4580
SFH 4585



TOPLED® with Lens
SFH 4209 / SFH 4289 / SFH 4219



SFH 4600 / SFH 4605
SFH 4650 / SFH 4655
SFH 4680 / SFH 4685



SMR
SFH 4500 / SFH 4510
SFH 4505 / SFH 4515



SMR
SFH 4580
SFH 4585



SIDELED®
SFH 425 / SFH 426 / SFH 4205 /
SFH 4255



Multi TOPLED®
SFH 331 / SFH 7222 / SFH 7221 /
SFH 7225 / SFH 7226



SMR
SFH 4500 / SFH 4510
SFH 4505 / SFH 4515



SmartLED® 0603
SFH 4050

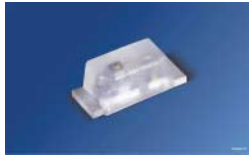
1. Emitter in SMT

TYPENÜBERSICHT

SUMMARY OF TYPES

2. Hochleistungsemitter 850nm

2. High Power Emitter 850 nm



SFH 4050



SFH 4250



SFH 4259



SFH 4650 / SFH 4655



SFH 4255



SFH 4550



SFH 4350



SFH 4850

3. Sehr schnelle Emitter 950nm

3. High speed emitter 950 nm



SmartLED®
SFH 4000



TOPLED®
SFH 4200



Power TOPLED®
SFH 4202



TOPLED® with Lens
SFH 4209



SFH 4600 / SFH 4605



SMR
SFH 4500 / SFH 4505



SIDELED®
SFH 4205



Mini TOPLED®
SFH 4203



Micro SIDELED®
SFH 4204



SFH 4301



SFH 4501 / SFH 4502 / SFH 4503

TYPENÜBERSICHT

SUMMARY OF TYPES

4. Emitter im Plastikgehäuse



IRL 80 A / IRL 81 A



SFH 4110



SFH 4111



SFH 4113



SFH 484 / SFH 485 / SFH 486
SFH 4550



LD 274



LD 271



SFH 415 / SFH 4501 / SFH 4502
SFH 4503



SFH 487



SFH 409



SFH 485 P



SFH 487 P



SFH 4301



SFH 4350



LD 261



LD 263



SFH 405

4. Emitters in Plastic Package

TYPENÜBERSICHT

SUMMARY OF TYPES

5. Emitter im Metallgehäuse



SFH 464 / SFH 483 / LD 242
SFH 4850



SFH 400 / SFH 480 / SFH 4840



SFH 4860



SFH 401



SFH 482



SFH 4881



SFH 4883

1. Emitter in SMT

1. Emitter in SMT

Package	Type	λ_{peak}	φ	I_e ($I_F = 100 \text{ mA}$, $t_P = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_P = 20 \text{ ms}$) V	t_r, t_f	Ordering code	Fig. No.
		nm	deg.			ns		

1.1 MIDLED

1.1 MIDLED

	SFH 4600	950	± 20	typ. 36	$1.5 (\leq 1.8)$	10	Q65110A1575	91
	SFH 4680	880		typ. 20		500	Q65110A1570	
	SFH 4650	850		typ. 41		12	Q65110A1572	
	SFH 4605	950		typ. 36		10	Q65110A1576	
	SFH 4685	880		typ. 20		500	Q65110A1571	
	SFH 4655	850		typ. 41		12	Q65110A1569	

Package	Type	λ_{peak}	φ	I_e ($I_F = 100 \text{ mA}$, $t_P = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_P = 20 \text{ ms}$) V	t_r, t_f	Ordering code	Fig. No.
		nm	deg.			ns		

1.2 SmartLED®

1.2 SmartLED®

 SmartLED®	SFH 4000	950	± 80	> 1.6 typ. 4.4	$1.5 (\leq 1.8)$	10	Q65110A2649	69
	SFH 4010	950		> 1.0 typ. 2.5	$1.3 (\leq 1.5)$	500	Q65110A2707	
	SFH 4020	850	± 15	typ. 8 (at $I_F = 8 \text{ mA}$)	$1.8 (\leq 2.5)$ (at $I_F = 8 \text{ mA}$, $t_P = 20 \text{ ms}$)	2	Q65110A2650	
	SFH 4080	880	± 80	> 1.0 typ. 2.5	$1.5 (\leq 1.8)$	500	Q65110A1217	
 SmartLED® 0603	SFH 4050	850		typ. 7		12	Q65110A2109	92

Package	Type	λ_{peak}	ϕ	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	t_r, t_f	Ordering code	Fig.
		nm	deg.			ns		No.

1.3 TOPLED®/SIDELED® Familie

1.3 TOPLED®/SIDELED® Family

TOPLED®

TOPLED®

 TOPLED®	SFH 420	950	± 60	≥ 2.5	1.3 (≤ 1.5)	500	Q65110A2473	66
	SFH 4211					500	Q65110A2515	
	SFH 421	880		≥ 4	500	Q65110A1218		
	SFH 4200	950		≥ 4 typ. 10		10	Q65110A2494	
 TOPLED® RG	SFH 4281	880		≥ 4	1.5 (≤ 1.8)	500	Q65110A2516	89
 Mini TOPLED®	SFH 4203	950	± 65	≥ 4 typ. 8		10	Q65110A2499	68
 Power TOPLED®	SFH 4250	850	± 60	typ. 14		12	Q65110A2465	93
	SFH 4257			typ. 6	Q65110A2466		107	
 TOPLED®	SFH 4271	880		> 1 typ. 2	2.0 (≤ 2.5) (at I _F = 20 mA)	500		Q65110A2521
	SFH 4272	645		> 0.16 typ. 0.35 (at I _F = 20 mA)				Q65110A2522
	SFH 4273	660	> 0.63 typ. 1 (at I _F = 50 mA)	2.1 (≤ 2.8) (at I _F = 50 mA)	100	Q65110A2523		

Package	Type	λ_{peak}	ϕ	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	t_r, t_f	Ordering code	Fig.
		nm	deg.			ns		No.

TOPLED® mit Linse

TOPLED® with Lens

	SFH 4209	950	± 25	> 6.3 typ. 24	1.5 (≤ 1.8)	10	Q65110A2501	67
	SFH 4219			> 4 typ. 13	1.3 (≤ 1.5)	500	Q65110A2518	
	SFH 4289	880		> 6.3 typ. 17			Q65110A2519	
 Power TOPLED® w. Lens	SFH 4259	850			typ. 30	1.5 (≤ 1.8)	12	Q65110A2464

IR-LUMINESZENZDIODEN

INFRARED EMITTERS

Package	Type	λ_{peak}	ϕ	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	t_r, t_f	Ordering code	Fig.
		nm	deg.			ns		No.

SIDELED®

SIDELED®

	SFH 425	950	± 60	≥ 2.5	1.3 (≤ 1.5)	500	Q65110A2463	90
	SFH 4205			≥ 4 typ.10	1.5 (≤ 1.8)	10	Q65110A2498	
	SFH 426	880		≥ 4		500	Q65110A2512	
	SFH 4255	850		typ. 14		12	Q65110A2467	
	SFH 4204	950		typ. 2.5 ($I_F = 40 \text{ mA}$, $t_p = 20 \text{ ms}$)	1.4 ($I_F = 40 \text{ mA}$, $t_p = 20 \text{ ms}$)	7 ($I_F = 40 \text{ mA}$)	Q65110A2504	99

Multi TOPLED®

Multi TOPLED®

Zwei Sender in SMT Multi TOPLED®

Two Emitters in SMT Multi TOPLED®

Package	Type	λ_{peak}	ϕ	I_V ($I_F = 2 \text{ mA}$) mcd	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F	t_r, t_f	Ordering code	Fig.
		nm	deg.			V	ns		No.
	SFH 7222	880	± 60	—	≥ 4	1.5 ($I_F = 100 \text{ mA}$)	500	Q65110A2742	72
		565	± 60	≥ 0.25 ($I_F = 2 \text{ mA}$)	—	2.0 ($I_F = 10 \text{ mA}$)	450		

Empfänger/Sender in SMT Multi TOPLED®

Detector/Emitter in SMT Multi TOPLED®

Package	Type	Sender Emitter	λ_{peak}	ϕ	I_V ($I_F = 10 \text{ mA}$) mcd	V_F ($I_F = 10 \text{ mA}$) V	t_r, t_f $I_F = 100 \text{ mA}$, $t_p = 10 \mu\text{s}$, $R_L = 50 \Omega$ ns	Ordering code	Fig.
			nm	deg.	mcd	V	ns		No.
	SFH 331-JK	Empfänger Detector	635	± 60	4 ...12.5	2.0 (≤ 2.6)	300, 150	Q65110A1206	5
			Radiant sensitive area mm ²	I_{PCE} ($\lambda = 950$ nm, $E_e =$ 0.1 mW/cm ² , $V_{CE} = 5 \text{ V}$) μA	V_{CEO}	$\lambda_{10\%}$	t_r, t_f ($I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$) μs		
			0.045	≥ 16	35	380 ...1150	7		

Package	Type	Sender Emitter	λ_{peak}	ϕ	I_V ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$) V	t_r, t_f $I_F = 100 \text{ mA}$, $R_L = 50 \Omega$ ns	Ordering code	Fig.
			nm	deg.	mW/sr	V	ns		No.
	SFH 7221	Empfänger Detector	880	± 60	> 4	1.5 (≤ 1.8)	500	Q65110A2741	6
			Radiant sensitive area mm ²	I_{PCE} ($\lambda = 880$ nm, $E_e =$ 0.1 mW/cm ² , $V_{CE} = 5 \text{ V}$) μA	V_{CEO}	$\lambda_{10\%}$	t_r, t_f ($I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$) μs		
			0.045	≥ 16	35	380 ... 1150	7		

IR-LUMINESZENZDIODEN

INFRARED EMITTERS

Package	Type	Sender Emitter	λ_{peak} nm	φ deg.	I_V ($I_F = 20 \text{ mA}$) mcd	V_F ($I_F = 20 \text{ mA}$) V		Ordering code	Fig.
	SFH 7225		591	± 60	63 ...200	2.0		Q65110A2743	5
		Empfänger Detector	Radiant sensitive area mm ²	I_{PCE} ($E_v = 1000 \text{ lx}$ Standard light A $V_{CE} = 5 \text{ V}$) μA	V_{CEO} V	Crosstalk I_{PCE} ($I_F = 20 \text{ mA}$, $V_{CE} = 5 \text{ V}$) μA			
			0.045	650 typ.	35	> 0.5			

Package	Type	Sender Emitter	λ_{peak} nm	φ deg.	I_V ($I_F = 20 \text{ mA}$) mcd	V_F ($I_F = 20 \text{ mA}$) V		Ordering code	Fig.
	SFH 7226		645	± 60	40 ...125	2.0		Q65110A2744	5
		Empfänger Detector	Radiant sensitive area mm ²	I_{PCE} ($E_v = 1000 \text{ lx}$ Standard light A $V_{CE} = 5 \text{ V}$) μA	V_{CEO} V	Crosstalk I_{PCE} ($I_F = 20 \text{ mA}$, $V_{CE} = 5 \text{ V}$) μA			
			0.045	650 typ.	35	> 2			

Package	Type	λ_{peak} nm	ϕ deg.	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	t_r, t_f ns	Ordering code	Fig. No.
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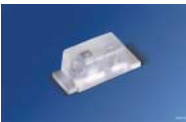
1.4 SMR

1.4 SMR

	SFH 4500	950	± 14	≥ 25 typ. 85	1.5 (≤ 1.8)	10	Q65110A2642	70
	SFH 4510			≥ 25 typ. 50	1.3 (≤ 1.5)	500	Q65110A2630	7
	SFH 4505			≥ 25 typ. 85	1.5 (≤ 1.8)	10	Q65110A2643	71
	SFH 4515			≥ 25 typ. 50	1.3 (≤ 1.5)	500	Q65110A2633	8
	SFH 4580	880	± 15	≥ 25 typ. 55	1.5 (≤ 1.8)	500	Q65110A2632	70
	SFH 4585						Q65110A2631	71

2. Hochleistungsemitter 850nm

2. High Power Emitter 850nm

Package	Type	λ_{peak} nm	φ deg.	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	t_r, t_f ns	Ordering code	Fig. No.		
 SmartLED® 0603	SFH 4050	850	± 80	typ. 7	1.5 (≤ 1.8) at $I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$ 2.4 (≤ 3.0) at $I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$	12	Q65110A2109	92		
 PowerTOPLED®	SFH 4250		± 60	typ. 14			Q65110A2465	93		
 TOPLED®	SFH 4257			typ. 6			Q65110A2466	107		
 PowerTOPLED® w. Lens	SFH 4259		± 25	typ. 30			Q65110A2464	94		
 SIDELED®	SFH 4255		± 60	typ. 14			Q65110A2467	90		
 MIDLED	SFH 4650		± 20	typ. 35			Q65110A1572	91		
 MIDLED	SFH 4655						Q65110A1569			
 T 1 3/4	SFH 4550		± 3	typ. 700			Q65110A1772	79		
 T 1	SFH 4350		± 15	typ. 70			Q65110A2091	73		

Package	Type	λ_{peak} nm	ϕ deg.	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	t_r, t_f ns	Ordering code	Fig. No.
 TO 18	SFH 4850 E7800	850	± 40	typ. 7	1.5 (≤ 1.8) at $I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$ 2.4 (≤ 3.0) at $I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$	12	Q65110A2093	40

3. Sehr schnelle Emitter 950 nm

3. High Speed Emitter 950 nm

Package	Type	λ_{peak} nm	φ deg.	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	t_r, t_f ns	Ordering code	Fig. No.		
 SmartLED®	SFH 4000	950	± 80	> 1.6 typ. 3.5	1.5 (≤ 1.8)	10	Q65110A2649	69		
 TOPLED®	SFH 4200		± 60	≥ 4 typ. 10			Q65110A2494	66		
 PowerTOPLED®	SFH 4202			> 6.3 typ. 10			Q65110A2503	93		
 TOPLED® with Lens	SFH 4209		± 25	> 10 typ. 17			Q65110A2501	67		
 SIDELED®	SFH 4205		± 25	≥ 4 typ. 10			Q65110A2498	90		
 	SFH 4600		± 20	typ. 36			Q65110A1575	91		
 	SFH 4605						Q65110A1576			
 Mini TOPLED®	SFH 4203		± 65	≥ 4 typ. 8			Q65110A2499	68		

Package	Type	λ_{peak} nm	φ deg.	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	t_r, t_f ns	Ordering code	Fig. No.
 Micro SIDELED®	SFH 4204		± 60	2.5 ($I_F = 400 \text{ mA}$, $t_p = 20 \text{ ms}$)	1.4	7	Q65110A2504	99
 T 1 3/4 SMR	SFH 4500	950	± 14	≥ 25 typ. 85	1.5 (≤ 1.8)	10	Q65110A2642	70
 T 1 3/4 SMR	SFH 4505						Q65110A2643	71
 T 1	SFH 4301		± 10	≥ 16 typ. 75			Q62702P5166	73
 T 1 3/4	SFH 4501		± 7	≥ 63 typ. 110			Q62702P5061	74
	SFH 4502		± 18	≥ 25 typ. 60			Q62702P5062	75
	SFH 4503		± 4	≥ 63 typ. 250			Q62702P5305	76

4. Emitter im Plastikgehäuse

4. Emitter in plastic package

Package	Type	λ_{peak} nm	φ deg.	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	Ordering code	Fig. No.
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4.1 Radiale Gehäuse

4.1 Radial packages

 T 1 3/4	SFH 4550	850	± 3	typ. 700	1.5 (≤ 1.8)	Q65110A1772	79
 T 1	SFH 4350		± 17	typ. 70		Q65110A2091	73
 T 1 3/4	SFH 484 SFH 484-2	880	± 8	≥ 50 ≥ 80		Q62703Q1092 Q62703Q1756	79
	SFH 486		± 11	≥ 40		Q62703Q1094	80
	SFH 485 SFH 485-2		± 20	≥ 25 25 ... 100		Q62703Q1093 Q62703Q1547	81

Package	Type	λ_{peak} nm	φ deg.	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) V	Ordering code	Fig. No.
 T 1	SFH 487 SFH 487-2 SFH 487-3	880	± 20	≥ 12.5 20 ... 80 32 ... 125	1.5 (≤ 1.8)	Q62703Q1095 Q62703Q2174 Q62703Q2175	73
 T 1 3/4	SFH 485 P		± 40	≥ 3.15		Q62703Q0516	82
 T 1	SFH 487 P		± 65	≥ 2		Q62703Q0517	83
 T 1 3/4	LD 274 LD 274-3	950	± 10	≥ 50 ≥ 80	1.3 (≤ 1.5)	Q62703Q1031 Q62703Q1820	84
 T 1 3/4	LD 271 LD 271 H		± 25	$15 (\geq 10)$ ≥ 16		Q62703Q0148 Q62703Q0256	85
	LD 271 L LD 271 LH					Q62703Q0833 Q62703Q0838	42
 T 1 3/4	SFH 415 SFH 415-U		± 17	≥ 25 ≥ 40		Q62702P0296 Q62702P1137	
	SFH 4511		± 4	63		Q62703Q5557	
 T 1	SFH 409 SFH 409-2		± 20	≥ 6.3 ≥ 10		Q62702P0860 Q62702P1002	73

Package	Type	λ_{peak} nm	φ deg.	I_e ($I_F = 20 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F ($I_F = 20 \text{ mA}$, $t_p = 20 \text{ ms}$) V	Ordering code	Fig. No.
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4.2 Sidelooker
4.2 Sidelooker

	IRL 81 A	880	± 25	≥ 1.0	1.5 (≤ 1.8)	Q68000A8000 ¹⁾	78
	IRL 80 A	950	± 30	≥ 0.4	1.2 (≤ 1.5)	Q68000A7851 ¹⁾	

Package	Type	λ_{peak} nm	ϕ deg.	I_e ($I_F = 20 \text{ mA}$, $t_P = 20 \text{ ms}$) mW/sr	V_F ($I_F = 20 \text{ mA}$, $t_P = 20 \text{ ms}$) V	Ordering code	Fig. No.
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4.2 Sidelooker (Forts.)

4.2 Sidelooker (cont'd)

	SFH 4110	950	± 9	≥ 2.5	$1.2 (\leq 1.4)$	Q62702P5072 ¹⁾	31
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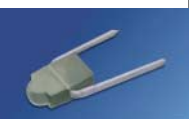
¹⁾ conversion to RoHS compliance 03/2005

Package	Type	λ_{peak} nm	ϕ deg.	E_e ($d = 6 \text{ mm}$, $I_F = 4 \text{ mA}$) mW/cm ²	V_F ($I_F = 20 \text{ mA}$, $t_P = 20 \text{ ms}$) V	Ordering code	Fig. No.
	SFH 4111	950	± 30 horizontal ± 60 vertical	0.25 ... 1	$1.25 (\leq 1.6)$	Q62702P5333	95
	SFH 4113		± 33 horizontal ± 43 vertical	0.25 ... 1.25		Q62702P5299	96

Package	Type	λ_{peak} nm	ϕ deg.	I_e mW/sr	V_F V	Ordering code	Fig. No.
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4.3 Zeilen im Plastikgehäuse

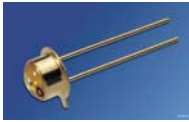
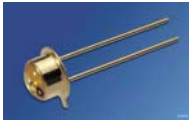
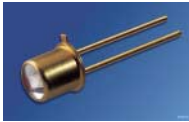
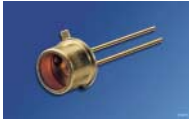
4.3 Arrays in Plastic Package

	LD 261 LD 261-5	950	± 15	2 ... 10 3.2 ... 6.3	$1.25 (\leq 1.4)$ ($I_F = 50 \text{ mA}$, $t_P = 20 \text{ ms}$)	Q62703Q0395 ¹⁾ Q62703Q0067 ¹⁾	36
	LD 262 LD 263 LD 264 LD 265 LD 266 LD 267 LD 268 LD 269 LD 260			2 ... 6.3		Q62703Q0070 ¹⁾ Q62703Q0071 ¹⁾ Q62703Q0072 ¹⁾ Q62703Q0073 ¹⁾ Q62703Q0074 ¹⁾ Q62703Q0075 ¹⁾ Q62703Q0076 ¹⁾ Q62703Q0077 ¹⁾ Q62703Q0078 ¹⁾	37
	SFH 405		± 16	≥ 1.6	$1.25 (\leq 1.4)$ ($I_F = 40 \text{ mA}$, $t_P = 20 \text{ ms}$)	Q62702P0835 ¹⁾	35

¹⁾ conversion to RoHS compliance 03/2005

5. Emmitter im Metallgehäuse

5. Emitters in Metal Package

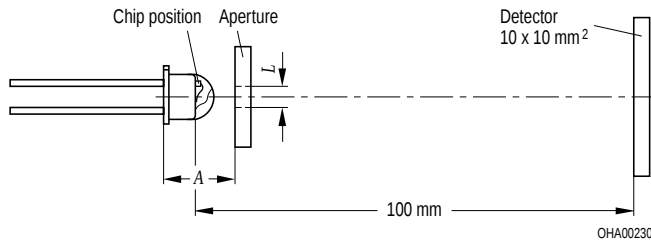
Package	Type	λ_{peak} nm	φ deg.	I_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) mW/sr	V_F V	Ordering code	Fig. No.
 TO 18	SFH 464 E 7800	660	± 23	≥ 1 ($I_F = 50 \text{ mA}$, $t_p = 20 \text{ ms}$)	2.1 ($I_F = 50 \text{ mA}$, $t_p = 20 \text{ ms}$)	Q62702P1745 ¹⁾	40
 TO 18	SFH 4860		± 50	≥ 0.63 ($I_F = 50 \text{ mA}$, $t_p = 20 \text{ ms}$)		Q62702P5053 ¹⁾	87
 TO 18	SFH 4850	850	± 40	typ. 7	1.5 (≤ 1.8) ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$)	Q65110A2093 ¹⁾	40
 TO 18	SFH 480 SFH 480-2/3	880	± 6	≥ 40		Q62703Q1087 ¹⁾ Q62703Q5195 ¹⁾	48
 TO 18	SFH 483-L/M E 7800		± 23	1 ... 3.2		Q62703Q4755 ¹⁾	40
 TO 18	SFH 482 SFH 482-1/2 SFH 482-2/3		± 30	≥ 3.15 3.15 ... 10 ≥ 5		Q62703Q1089 ¹⁾ Q62703Q4771 ¹⁾ Q62703Q4754 ¹⁾	49
 TO 18	SFH 482-M E7800			1.6 ... 3.2		Q62703Q2186 ¹⁾	
 TO 46	SFH 4881		± 5	≥ 40 typ. 72		Q62702P5302 ¹⁾	97
 TO 46	SFH 4883		± 35	≥ 4 typ. 8		Q62702P5303 ¹⁾	98
 TO 18	LD 242-2/3 LD 242 E7800	950	± 40	4 ... 25 1 ... 3.2	1.3 (≤ 1.5) ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$)	Q62703Q4749 ¹⁾ Q62703Q3509 ¹⁾	40

Package	Type	λ_{peak} nm	φ deg.	I_{e} (I_{F} = 100 mA, t_{p} = 20 ms) mW/sr	V_{F} V	Ordering code	Fig. No.
 TO 18	SFH 400	950	± 6	≥ 20	1.3 (≤ 1.5) (I_{F} = 100 mA, t_{p} = 20 ms)	Q62 702P0096 ¹⁾	48
 TO 18			± 15	≥ 10		Q62 702P0097 ¹⁾	88
UV- Emitter							
 TO 18	SFH 4840	395	± 3	typ. 45 (I_{F} = 30 mA, t_{p} = 20 ms)	3.7 (< 4.3) (I_{F} = 30 mA, t_{p} = 20 ms)	Q65110A1303 ¹⁾	48

¹⁾ conversion to RoHS compliance 03/2005

Lochblendenmessung

Für Lichtschranken Anwendungen sind Bauteile lieferbar, die eine „Lochblendenmessung“ durchlaufen haben. Diese Messung ist durch den Anhang „E 7800“ an die Typenbezeichnung gekennzeichnet.



Vorteile

Bei der Lochblendenmessung wird nur diejenige Strahlung in Achsrichtung bewertet, die direkt aus der Oberfläche des Chips austritt. Reflexionen der Bodenplatte und Seitenstrahlung fließen nicht in die I_a -Messung ein. Diese reflektierte Strahlung ist störend, wenn die Chipoberfläche über Zusatzoptiken abgebildet wird, z.B. beim Aufbau von Lichtschranken mit großer Reichweite. Der Anwender erhält durch die Lochblendenmessung ein für Lichtschrankenapplikationen optimal gemessenes Bauteil.

Aperture measurement

Components for light reflection switch applications are supplied which have passed an aperture measurement. This measurement is denoted by "E 7800" added to the type designation.

Type	L (mm)	A (mm)
LD 242	Ø 1.1	4
SFH 464	Ø 1.1	4
SFH 482	Ø 2.0	5.4
SFH 483	Ø 1.1	4

Advantages

Only the radiation in axial direction emitting directly from the chip surface will be evaluated during aperture measurement. Radiation reflected by the bottom plate and sidefacing of the chip will not be evaluated. This reflected radiation is disruptive when the chip surface is supplemented by an additional optical system e.g. in the construction of reflection switches. By using components which have passed the aperture measurement test, the user obtains devices which are optimally suited for the construction of reflection switches.

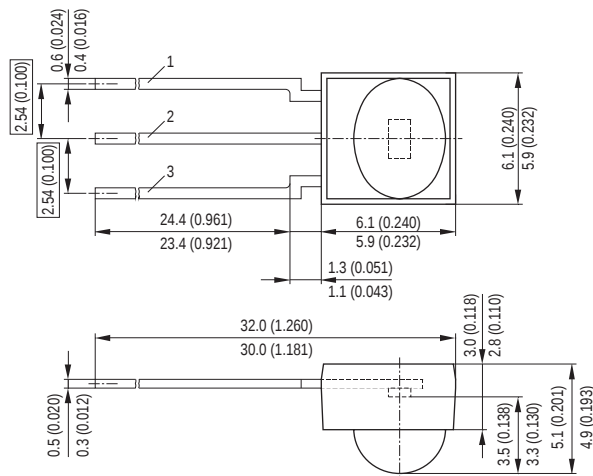
SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Maßbilder in mm (inch)

Outline Drawings dimensions in mm (inch)

Figure 1 SFH 5110

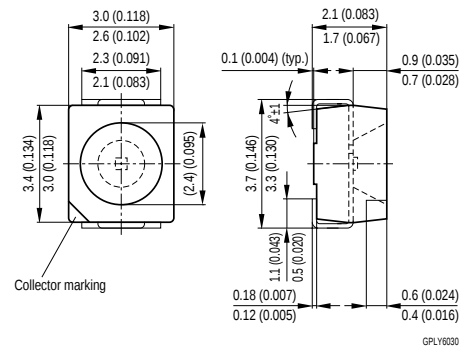


Pinning SFH 5110

- 1 OUT
- 2 GND
- 3 V_{CC}

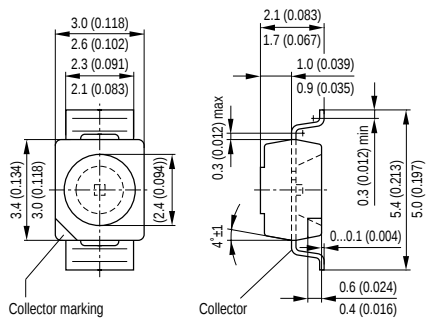
GEOY6985

Figure 2 SFH 320, SFH 320 FA



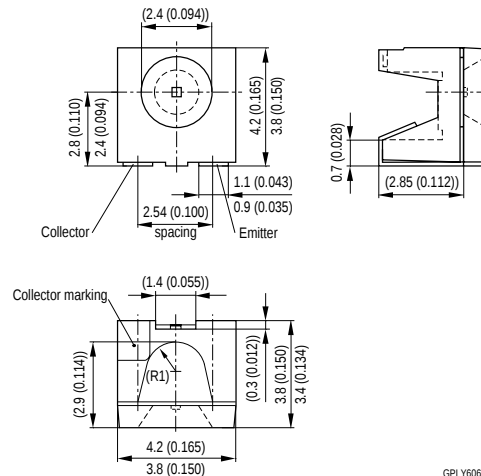
GPLY6030

Figure 3 SFH 3211, SFH 3211 FA



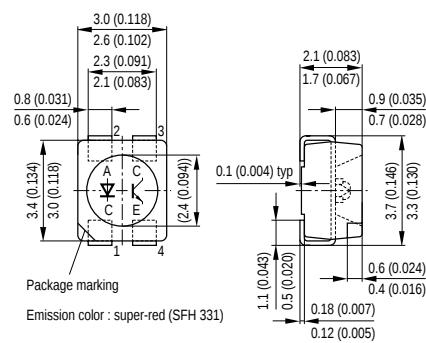
GPLY6067

Figure 4 SFH 325, SFH 325 FA,



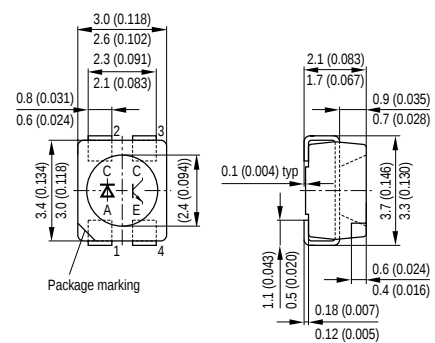
GPLY6068

Figure 5 SFH 331, SFH 7225, SFH 7226



GPLY6924

Figure 6 SFH 7221



GPLY6965

SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Maßbilder in mm (inch)

Outline Drawings dimensions in mm (inch)

Figure 7 SFH 3500, SFH 3500 FA,
SFH 2500, SFH 2500 FA,
SFH 4510

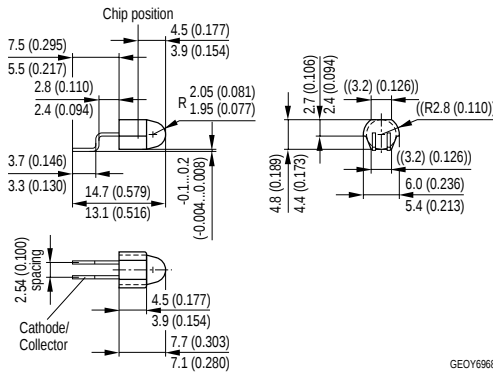


Figure 8 SFH 3505, SFH 3505 FA,
SFH 2505, SFH 2505 FA,
SFH 4515

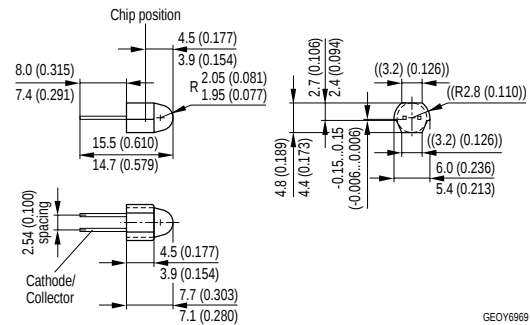


Figure 9 SFH 3400

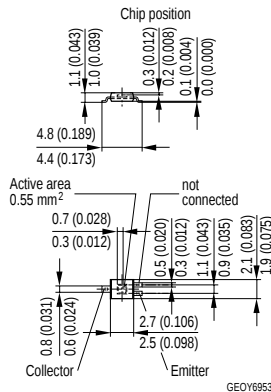


Figure 10 SFH 3401

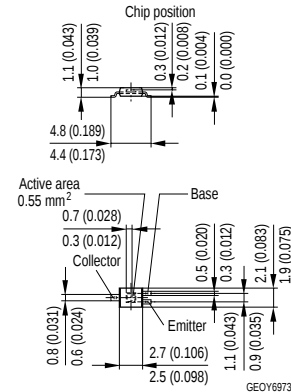


Figure 11 SFH 3201

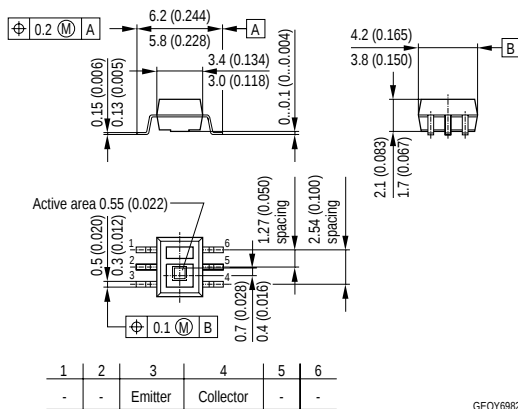
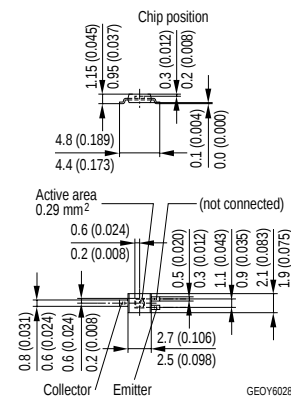


Figure 12 SFH 3410



Maßbilder in mm (inch)

Outline Drawings dimensions in mm (inch)

Figure 13 BP 104 FS, BP 104 S,
BP 104 FAS

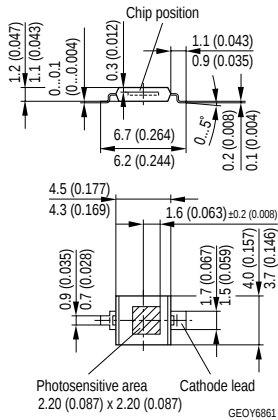


Figure 14 BPW 34 S, BPW 34 FS,
BPW 34 FAS, BPW 34 BS
SFH 2430

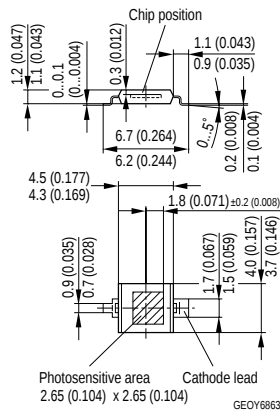


Figure 15 BPW 34 S R18R,
BPW 34 FAS R18R,
BPW 34 FS R18R

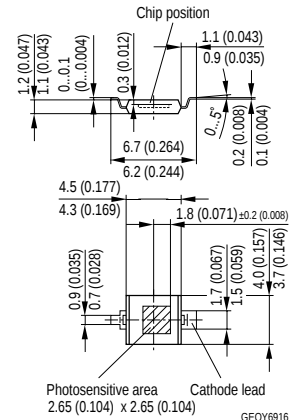


Figure 16 SFH 2400, SFH 2400 FA

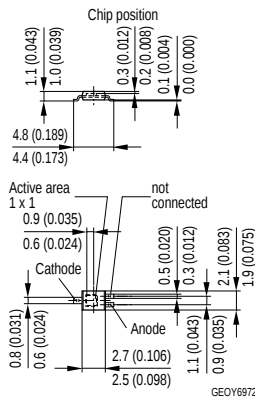


Figure 17 KOM 2125, KOM 2125 FA

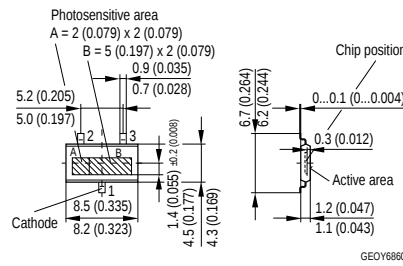


Figure 18 SFH 5440, SFH 5441

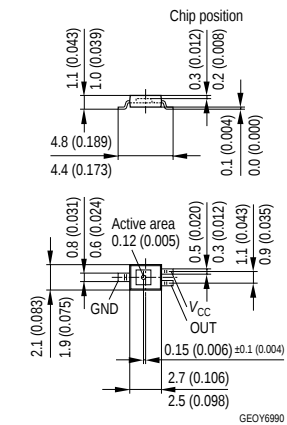


Figure 19 SFH 5140 F, SFH 5141 F

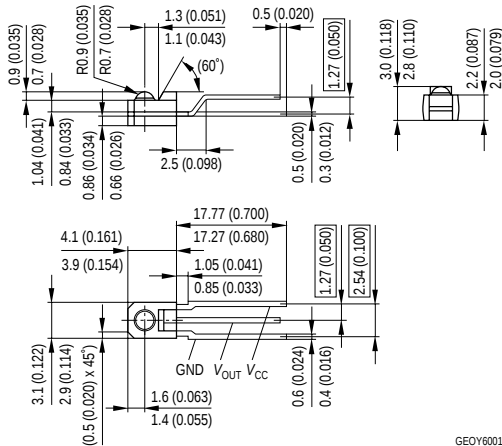
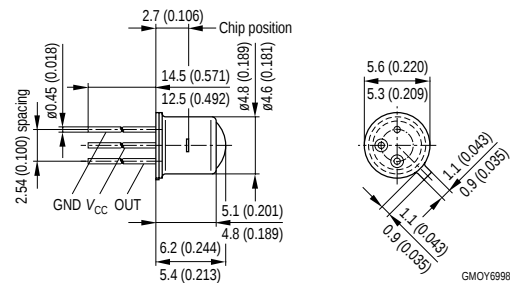


Figure 20 SFH 5840, SFH 5841



Maßbilder in mm (inch)

Outline Drawings dimensions in mm (inch)

Figure 21 SFH 5400

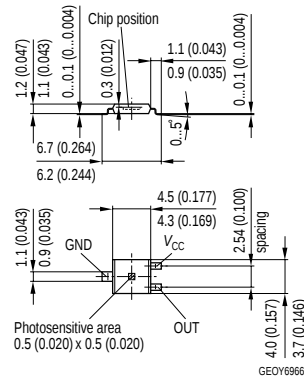


Figure 23 SFH 309, SFH 309 FA,
SFH 229, SFH 229 FA

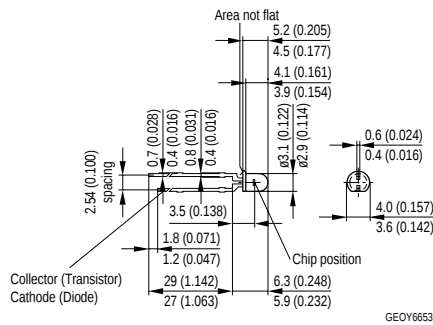


Figure 24 SFH 310, SFH 310 FA

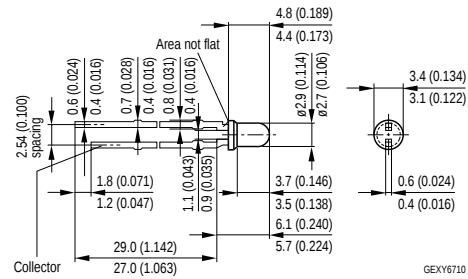


Figure 25 SFH 309 P, SFH 309 PFA

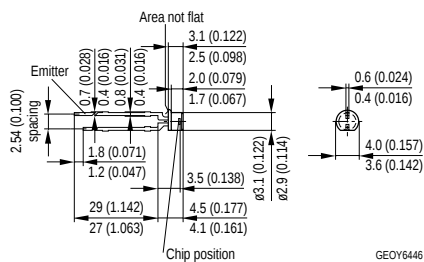
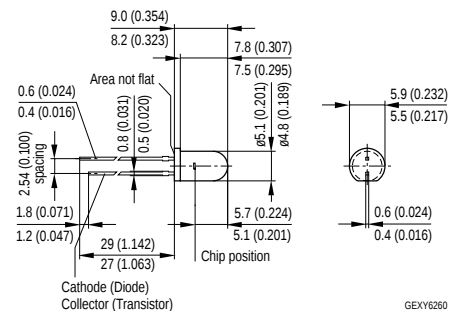


Figure 26 SFH 313, SFH 313 FA
SFH 213, SFH 213 FA



SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 28 SFH 300, SFH 300 FA



Figure 30 LPT 80 A



Figure 32 BPX 43, BPY 62



SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 35 SFH 305, SFH 405

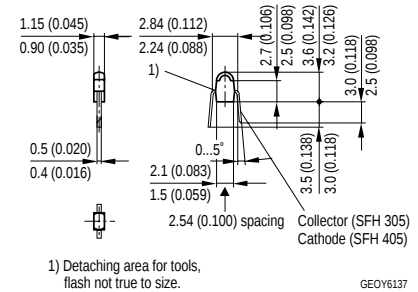


Figure 6 shows a detailed cross-sectional view of the cathode assembly. Key dimensions are provided in millimeters (mm) with values in parentheses representing standard deviations or tolerances. The assembly consists of a Cathode (LD 263) at the base, a Collector (BPX 83) above it, and a Chip positioned between them. The chip has a width of 7.4 mm (0.291) and a height of 1.9 mm (0.075). The chip is mounted on a substrate with a thickness of 0.5 mm (0.020). The chip-to-collector distance is 0.7 mm (0.028). The collector has a diameter of 2.54 mm (0.100). The cathode has a diameter of 3.5 mm (0.138) and a height of 1.4 mm (0.055). The chip is positioned such that its center is offset from the cathode center by 0.4 mm. The chip is also offset from the collector center by 0.4 mm. The chip is positioned such that its top surface is 0.25 mm (0.010) below the collector's top surface. The chip is positioned such that its bottom surface is 0.15 mm (0.006) above the cathode's top surface. The chip is positioned such that its left edge is 2.1 mm (0.083) from the cathode's left edge. The chip is positioned such that its right edge is 1.5 mm (0.059) from the cathode's right edge. The chip is positioned such that its top surface is 3.6 mm (0.142) from the cathode's top surface. The chip is positioned such that its bottom surface is 3.2 mm (0.126) from the cathode's top surface.

2.7 (0.106) Chip position

Chip position 4.1 (0.161)

Chip position 4.3 (0.169)

ø0.45 (0.018)

2.54 (0.100) Spacing

14.5 (0.571)

3.6 (0.142)

12.5 (0.492)

3.0 (0.118)

1:1 (0.049)

0.9 (0.035)

1

ø0.5 (0.021)

ø0.2 (0.020)

Anode (LD 242, BPX 63, SFH 464)

Cathode (SFH 483, SFH 4850)

Approx. weight 0.5 g

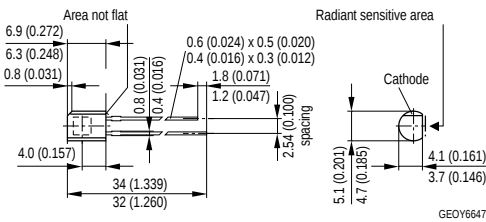
GETY6625

SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Maßbilder in mm (inch)

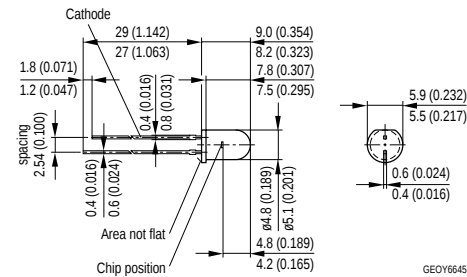
Outline Drawings dimensions in mm (inch)

Figure 41 **SFH 206 K**



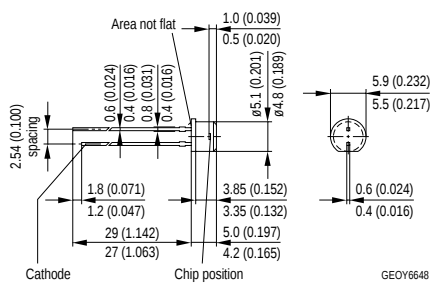
GEOY6647

**Figure 42 SFH 203, SFH 203 FA,
LD 271 L/LH, SFH 415, SFH 4511**



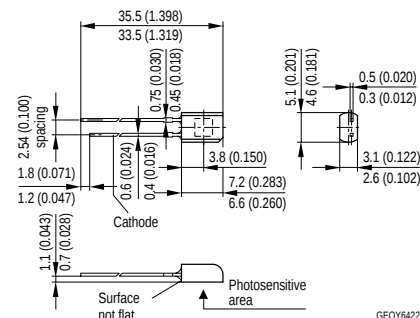
GEOY6645

Figure 43 SFH 203 P, SFH 203 PFA



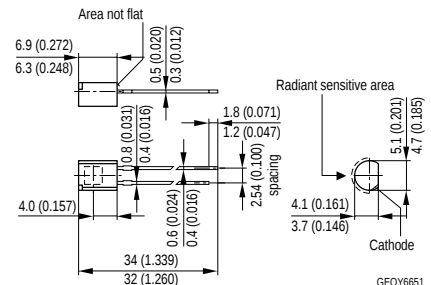
GEOY6648

Figure 44 SFH 225 FA, SFH 235 FA



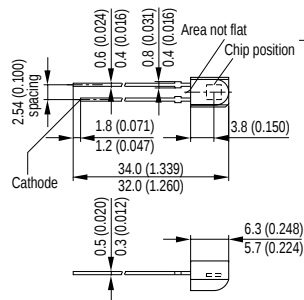
GEOY6423

Figure 45 **SFH 205 F, SFH 205 FA**



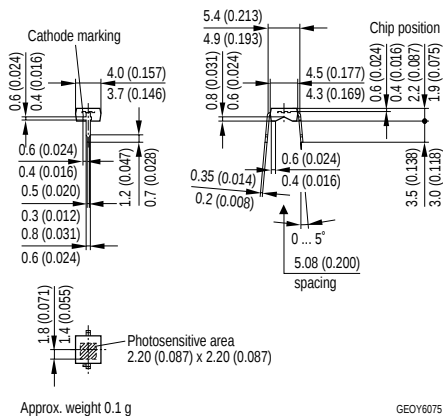
GEOY6651

Figure 46 **SFH 204 F, SFH 204 FA**



GEOY6964

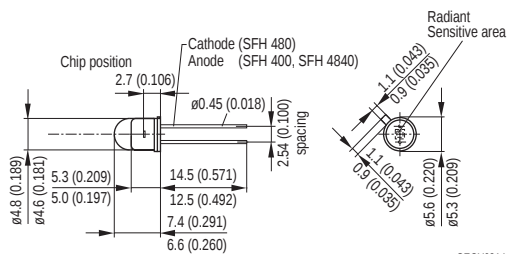
Figure 47 BP 104 F



Approx. weight 0.1 g

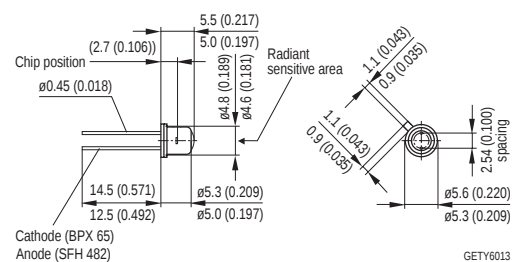
GEOY6075

Figure 48 SFH 400, SFH 480, SFH 4840



GEOY6314

Figure 49 SFH 482, BPX 65



GETY6013

SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

Maßbilder in mm (inch)

SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 50 BPW 21, BPX 61

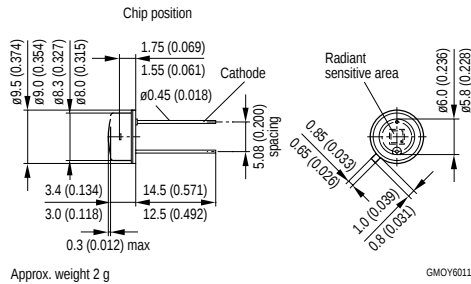


Figure 51 SFH 221

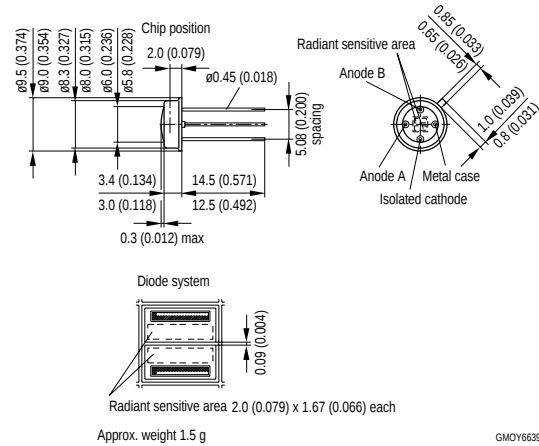


Figure 52 BPX 48, BPX 48 F

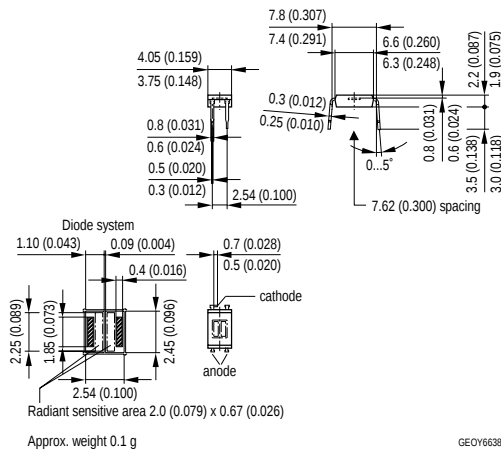


Figure 54 SFH 9300

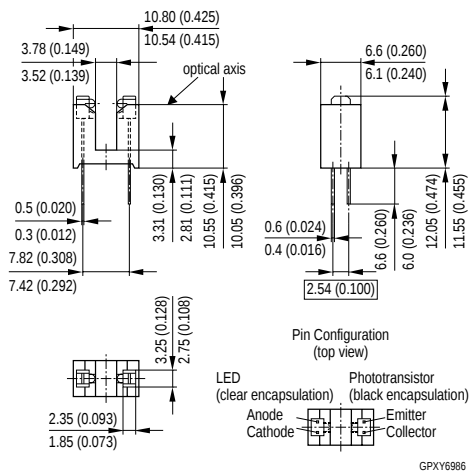
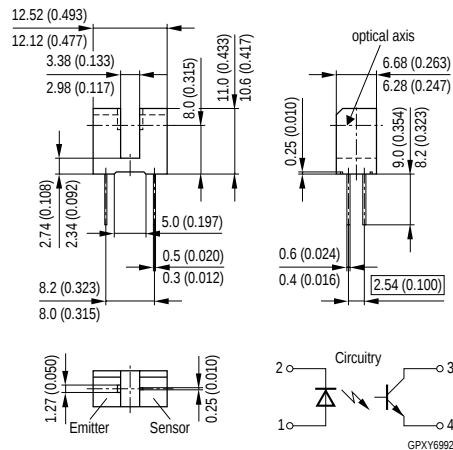


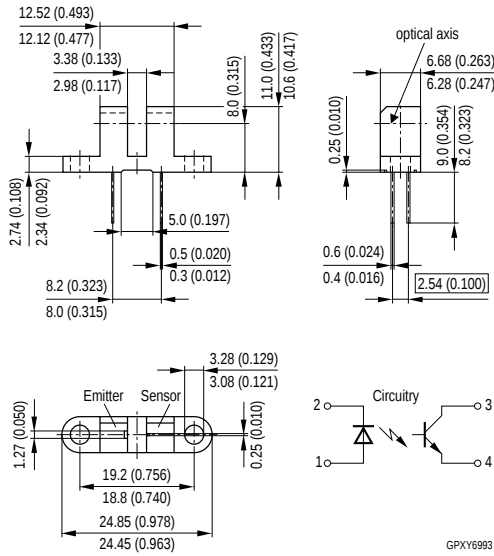
Figure 55 SFH 9301



SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

Maßbilder in mm (inch)

Figure 56 SFH 9302



SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 57 SFH 9303

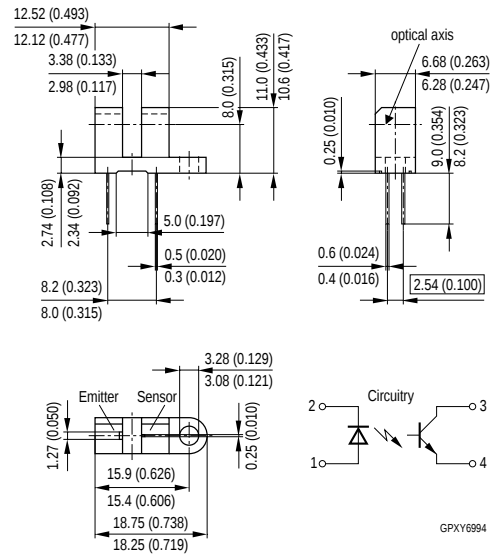


Figure 58 SFH 9304

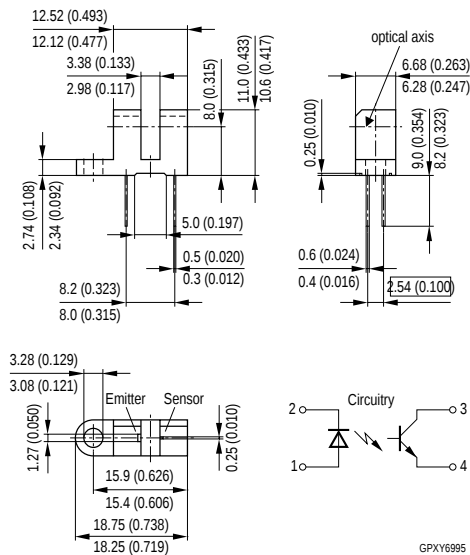
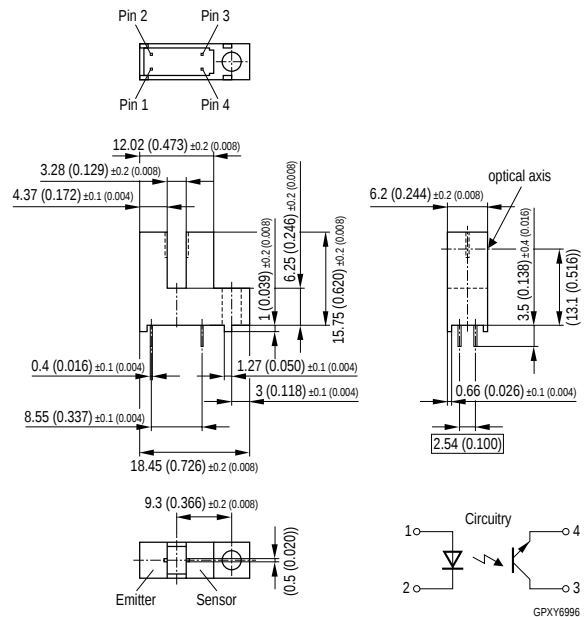


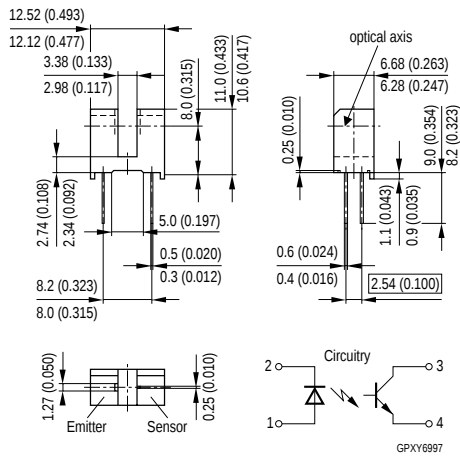
Figure 59 SFH 9305



SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

Maßbilder in mm (inch)

Figure 60 SFH 9306



SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 61 SFH 9310

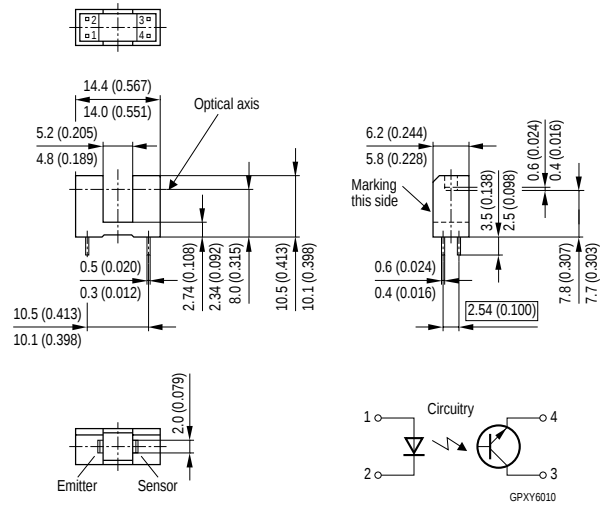


Figure 63 SFH 9500

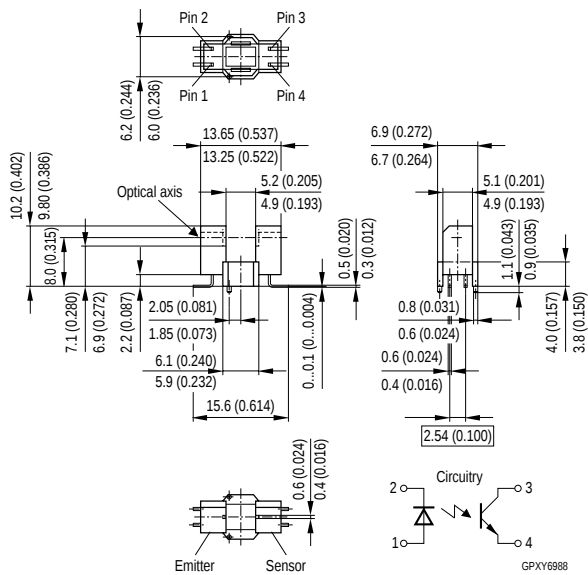
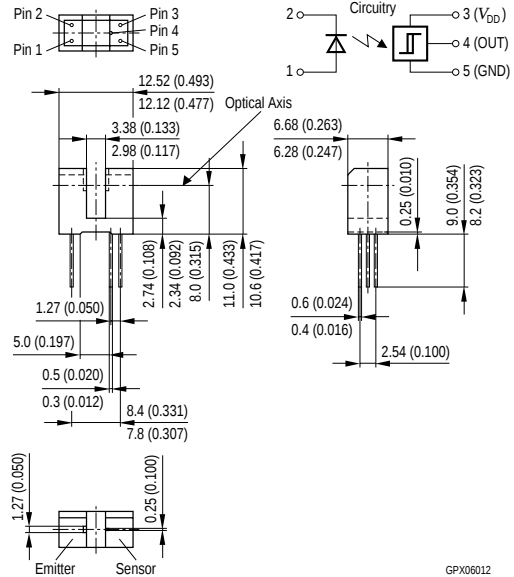


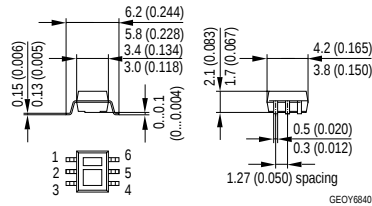
Figure 64 SFH 9340, SFH 9341



SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

Maßbilder in mm (inch)

Figure 65 SFH 9201, SFH 9202,
SFH 9240, SFH 9241,
SFH 9210, SFH 9221



Type	1	2	3	4	5	6
SFH 9201, SFH 9202,	Anode	—	Emitter	Collector	—	Cathode
SFH 9240, SFH 9241	Anode	OUT	V _{CC}	—	GND	Cathode
SFH 9210	Anode	—	Emitter	Collector	—	Cathode
SFH 9221	Anode (E)	—	Anode (S)	Cathode (S)	—	Cathode (E)

SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 66 SFH 420, SFH 4211, SFH 421, SFH 4200

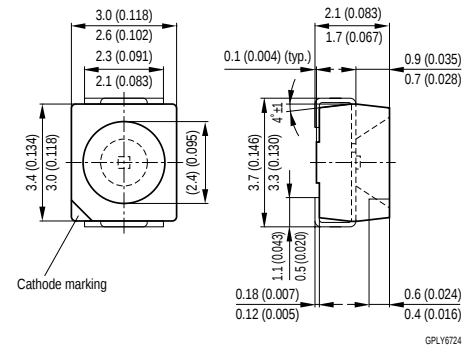


Figure 67 SFH 4209, SFH 4219, SFH 4289, SFH 3219

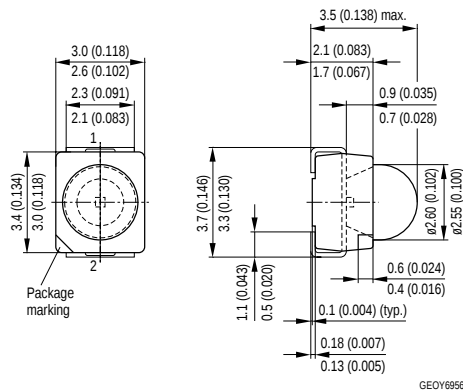


Figure 68 SFH 4203

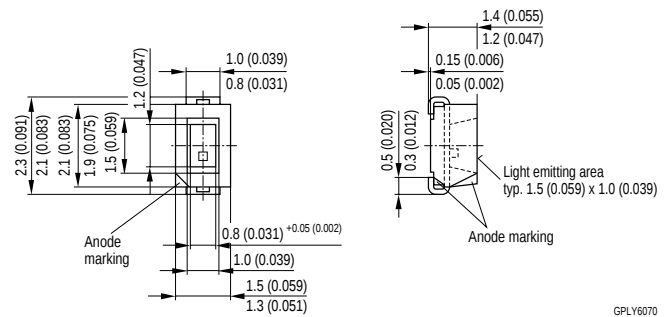


Figure 69 SFH 3010, SFH 4000, SFH 4010, SFH 4020, SFH 4080

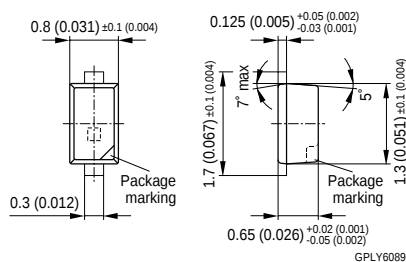
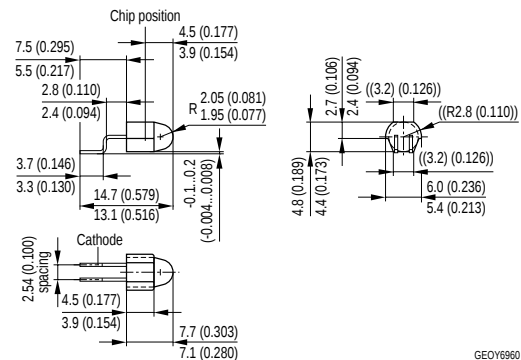


Figure 70 SFH 4580, SFH 4500

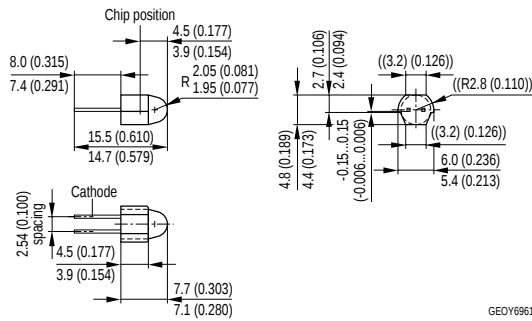


SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Maßbilder in mm (inch)

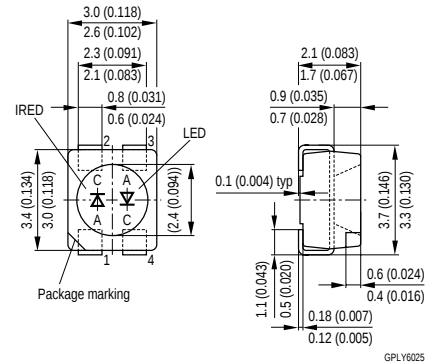
Outline Drawings dimensions in mm (inch)

Figure 71 SFH 4585, SFH 4505



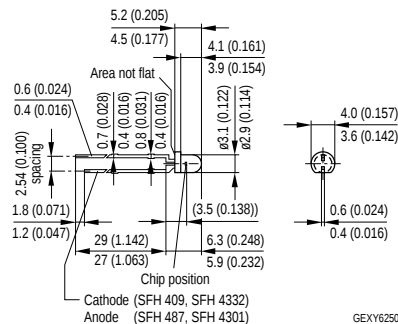
GEOY6961

Figure 72 SFH 7222



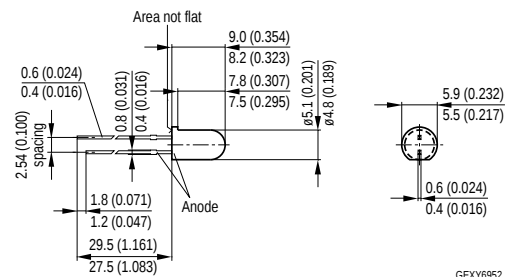
GPLY6025

Figure 73 **SFH 487, SFH 4301, SFH 409, SFH 4350**



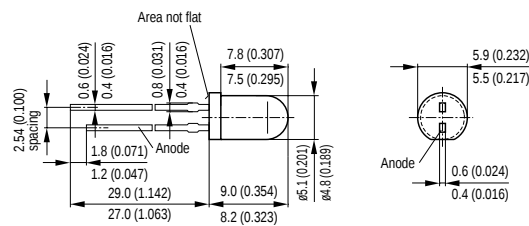
GEXY6250

Figure 74 SFH 4501



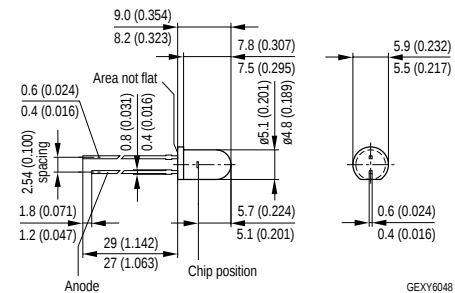
GEXY6952

Figure 75 SFH 4502



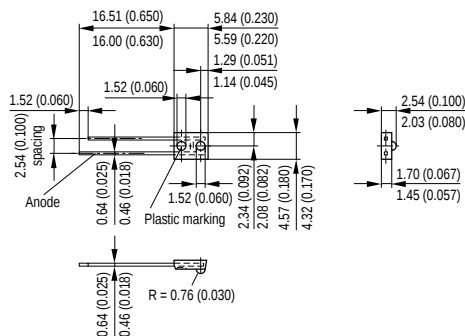
GEXY6718

Figure 76 SFH 4503



GEXY6048

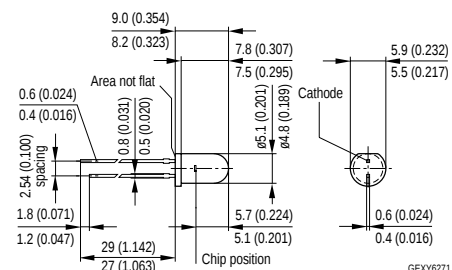
Figure 78 IRL 80 A, IRL 81 A



Approx. weight 0.2 g

GEOY6461

Figure 79 SFH 484, SFH 4550



GEXY6271

SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

Maßbilder in mm (inch)

SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 80 SFH 486

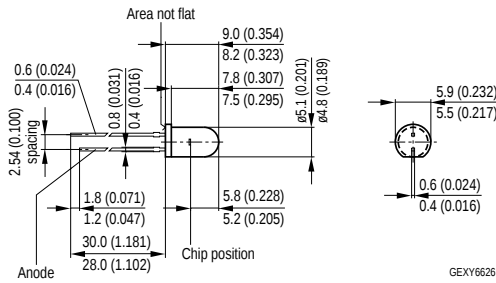


Figure 81 SFH 485

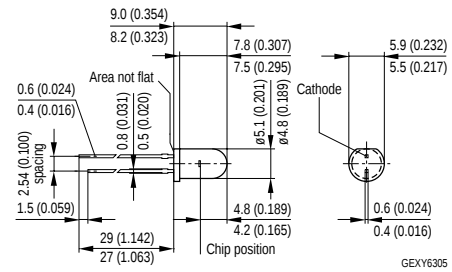


Figure 82 SFH 485 P

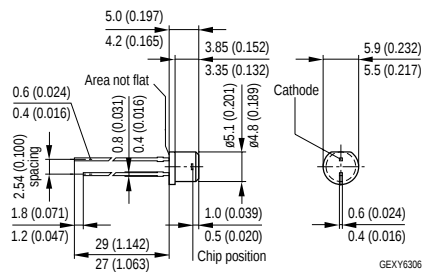


Figure 83 SFH 487 P

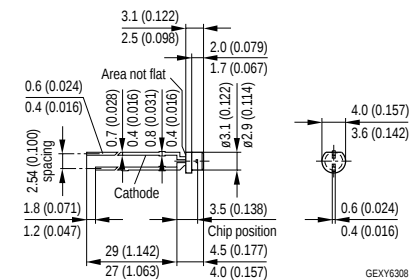


Figure 84 LD 274

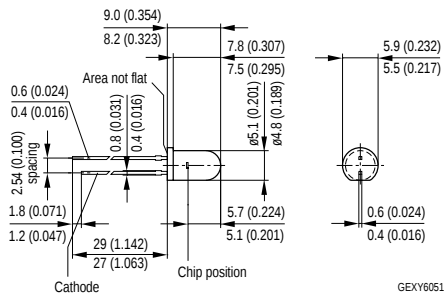


Figure 85 LD 271, LD 271 H

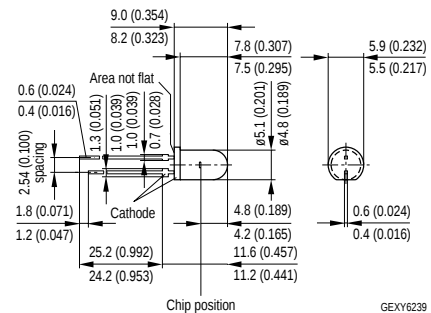


Figure 87 SFH 4860

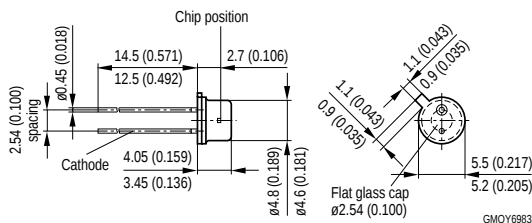
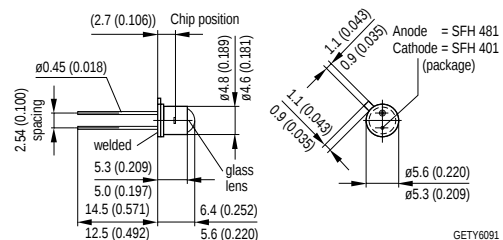


Figure 88 SFH 401



SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

Maßbilder in mm (inch)

SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 89 SFH 4281

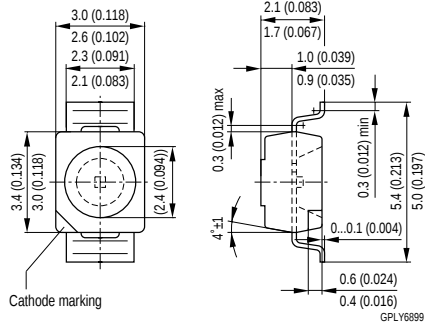


Figure 90 SFH 425, SFH 426, SFH 4205, SFH 4255

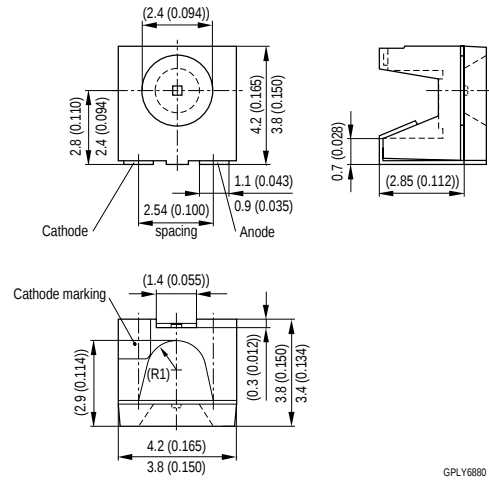


Figure 91 SFH 3600, SFH 3605, SFH 4600, SFH 4605,
SFH 4650, SFH 4655, SFH 4680, SFH 4685

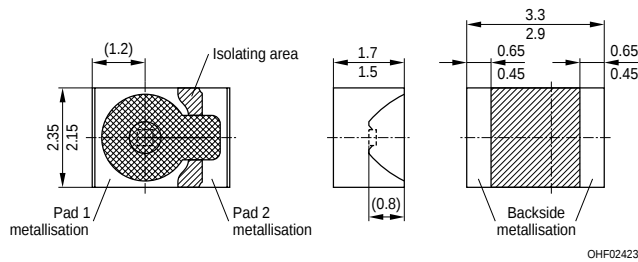


Figure 92 SFH 4050

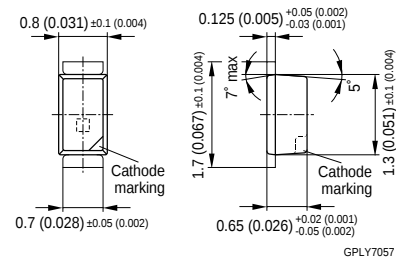


Figure 93 SFH 4250, SFH 4202

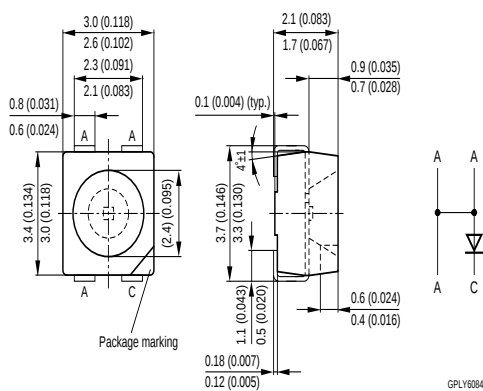
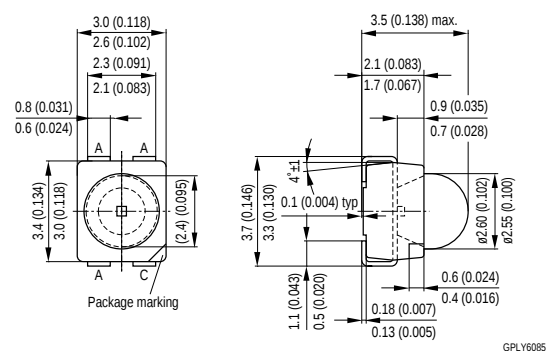


Figure 94 SFH 4259



SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 96 SFH 4113

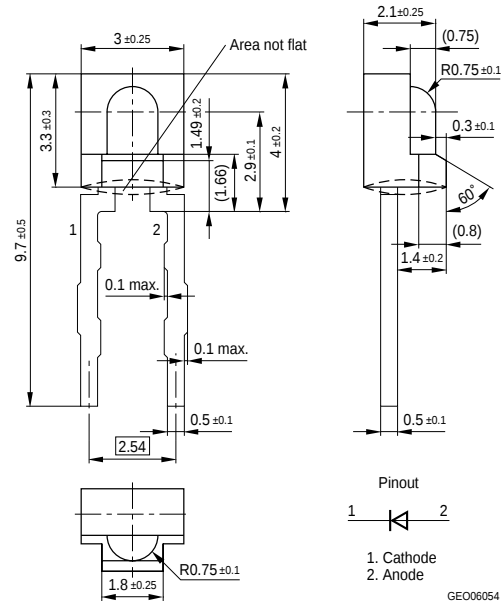


Figure 98 SFH 4883

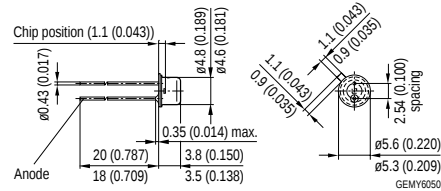
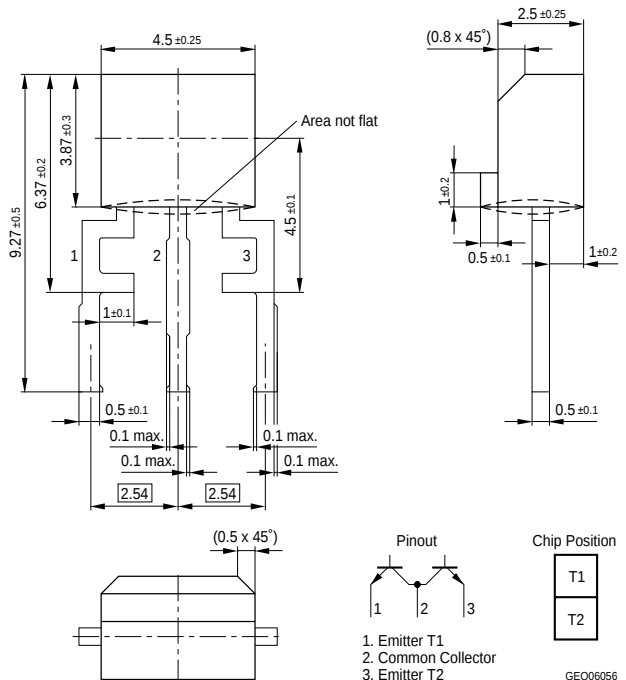


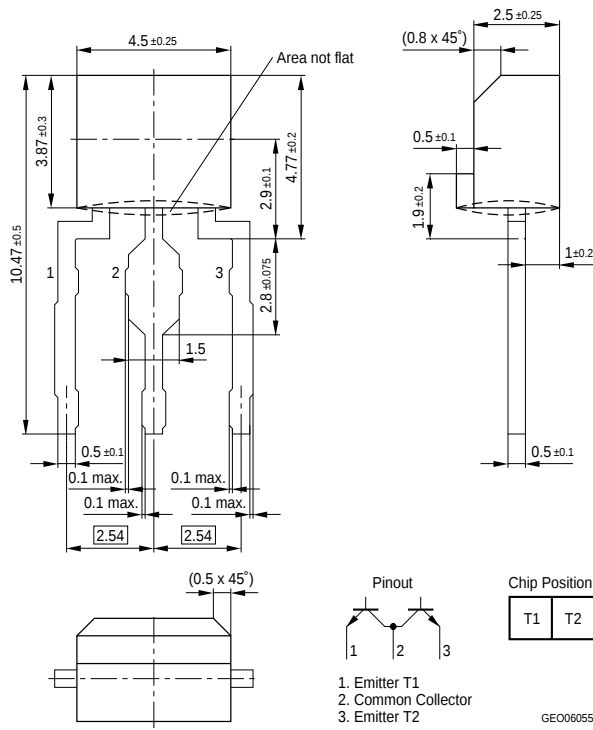
Figure 100 SFH 3160 F



SI-FOTODETEKTOREN, OPTISCHE SENSOREN UND IR-LUMINESZENZDIODEN

Maßbilder in mm (inch)

Figure 101 SFH 3162 F



SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 102 SFH 3163 F

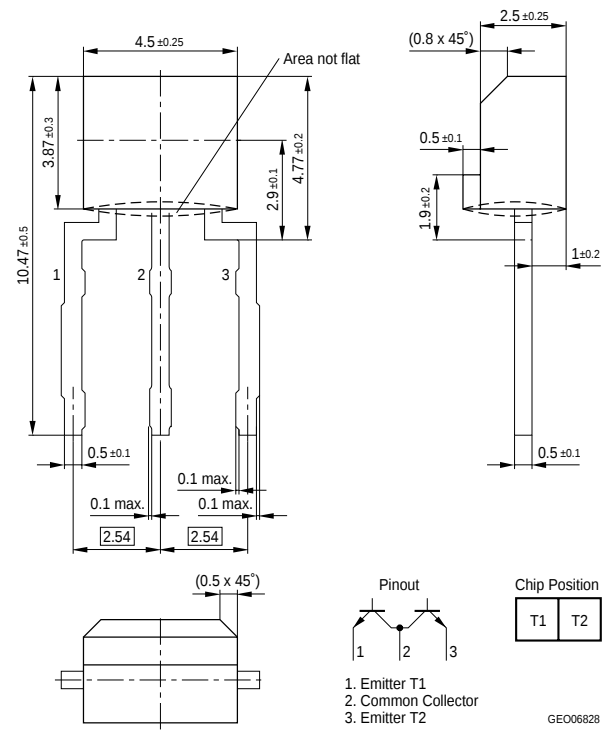


Figure 103 SFH 5130

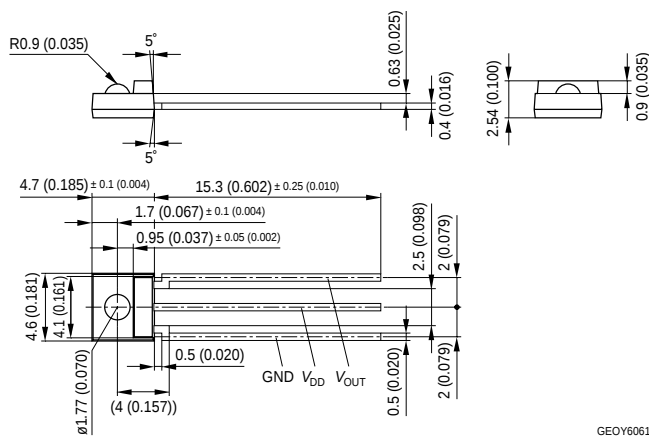
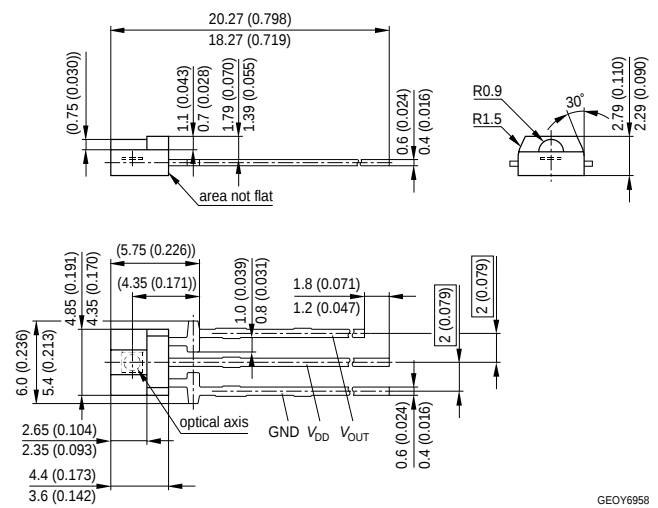


Figure 104 SFH 5133



SILICON PHOTODETECTORS, OPTICAL SENSORS AND INFRARED EMITTERS

Outline Drawings dimensions in mm (inch)

Figure 106 SFH 4272, SFH 4273

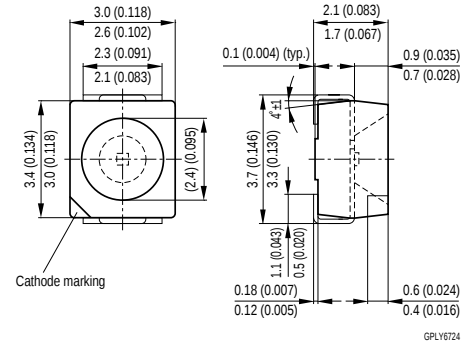
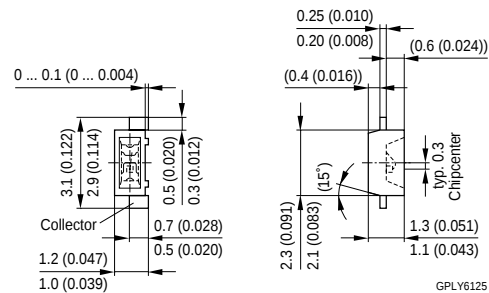


Figure 108 SFH 3204



The technical drawing shows two views of a cathode assembly:

- Side View (Left):** Shows a cylindrical component with a central hole. Dimensions include:
 - Total length: 2.7 (0.106)
 - Chip position offset: 0.169 (0.0066)
 - Inner diameter: $\varnothing 0.45$ (0.018)
 - Outer diameter: $\varnothing 4.3$ (0.169) and $\varnothing 4.1$ (0.161)
 - Spacers: 2.54 (0.100)
 - Anode distance: 14.5 (0.571)
 - Cathode distance: 3.6 (0.142)
 - Base width: 12.5 (0.492)
 - Base radius: 3.0 (0.118)
- Top View (Right):** Shows a circular base with four mounting holes. Dimensions include:
 - Hole diameters: 1.1 (0.043) and 0.9 (0.035)
 - Mounting hole diameters: 1.1 (0.043) and 0.9 (0.035)
 - Overall diameter: $\varnothing 5.5$ (0.217) and $\varnothing 5.2$ (0.205)

Assembly Details:

- Anode (LD 242, BFX 63, SFH 464)
- Cathode (SFH 483, SFH 4850)
- Approx. weight 0.5 g

GETY6625