





ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>INPUT</b>				
Reverse voltage		V <sub>R</sub>	6	V
DC forward current		I <sub>F</sub>	60	mA
Forward surge current	t <sub>p</sub> ≤ 10 μs	I <sub>FSM</sub>	2.5	A
LED power dissipation	at 25 °C	P <sub>diss</sub>	70	mW
<b>OUTPUT</b>				
Collector emitter voltage		V <sub>CEO</sub>	70	V
Emitter collector voltage		V <sub>ECO</sub>	7	V
Collector current		I <sub>C</sub>	50	mA
Collector peak current	t <sub>p</sub> /T = 0.5, t <sub>p</sub> ≤ 10 ms	I <sub>CM</sub>	100	mA
Output power dissipation	at 25 °C	P <sub>diss</sub>	150	mW
<b>COUPLER</b>				
Isolation test voltage between emitter and detector	t = 1 s	V <sub>ISO</sub>	5300	V <sub>RMS</sub>
Creepage distance			≥ 7	mm
Clearance distance			≥ 7	mm
Isolation thickness between emitter and detector			≥ 0.4	mm
Comparative tracking index per DIN IEC 112/VDE 0303, part 1		CTI	≥ 175	
Isolation resistance	V <sub>IO</sub> = 500 V, T <sub>amb</sub> = 25 °C	R <sub>IO</sub>	≥ 10 <sup>12</sup>	Ω
	V <sub>IO</sub> = 500 V, T <sub>amb</sub> = 100 °C	R <sub>IO</sub>	≥ 10 <sup>11</sup>	Ω
Operation temperature		T <sub>amb</sub>	-55 to +100	°C
Storage temperature range		T <sub>stg</sub>	-55 to +150	°C
Soldering temperature <sup>(1)</sup>	2 mm from case, ≤ 10 s	T <sub>slid</sub>	260	°C

**Notes**

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.

<sup>(1)</sup> Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>INPUT</b>							
Forward voltage	I <sub>F</sub> = 60 mA		V <sub>F</sub>		1.35	1.65	V
Reverse current	V <sub>R</sub> = 6 V		I <sub>R</sub>		0.01	10	μA
Capacitance	V <sub>R</sub> = 0 V, f = 1 MHz		C <sub>O</sub>		13		pF
<b>OUTPUT</b>							
Collector emitter capacitance	V <sub>CE</sub> = 5 V, f = 1 MHz		C <sub>CE</sub>		5.2		pF
Collector emitter leakage current	V <sub>CE</sub> = 10 V	SFH615A-1	I <sub>CEO</sub>		2	50	nA
		SFH615A-2	I <sub>CEO</sub>		2	50	nA
		SFH615A-3	I <sub>CEO</sub>		5	100	nA
		SFH615A-4	I <sub>CEO</sub>		5	100	nA
<b>COUPLER</b>							
Collector emitter saturation voltage	I <sub>F</sub> = 10 mA, f = 1 MHz		V <sub>CEsat</sub>		0.25	0.4	V
Coupling capacitance			C <sub>C</sub>		0.4		pF

**Note**

- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.



<b>CURRENT TRANSFER RATIO</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
$I_C/I_F$	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$	SFH615A-1	CTR	40		80	%
		SFH615A-2	CTR	63		125	%
		SFH615A-3	CTR	100		200	%
		SFH615A-4	CTR	160		320	%
	$I_F = 1\text{ mA}, V_{CE} = 5\text{ V}$	SFH615A-1	CTR	13	30		%
		SFH615A-2	CTR	22	45		%
		SFH615A-3	CTR	34	70		%
		SFH615A-4	CTR	56	90		%

<b>SWITCHING CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>NON-SATURATED</b>							
Turn-on time	$I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$		$t_{on}$		3		$\mu\text{s}$
Rise time	$I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$		$t_r$		2		$\mu\text{s}$
Turn-off time	$I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$		$t_{off}$		2.3		$\mu\text{s}$
Fall time	$I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$		$t_f$		2		$\mu\text{s}$
Cut-off frequency	$I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$		$f_{CO}$		100		kHz
<b>SATURATED</b>							
Turn-on time	$I_F = 20\text{ mA}$	SFH615A-1	$t_{on}$		3		$\mu\text{s}$
	$I_F = 10\text{ mA}$	SFH615A-2	$t_{on}$		4.2		$\mu\text{s}$
		SFH615A-3	$t_{on}$		4.2		$\mu\text{s}$
	$I_F = 5\text{ mA}$	SFH615A-4	$t_{on}$		6		$\mu\text{s}$
Rise time	$I_F = 20\text{ mA}$	SFH615A-1	$t_r$		2		$\mu\text{s}$
	$I_F = 10\text{ mA}$	SFH615A-2	$t_r$		3		$\mu\text{s}$
		SFH615A-3	$t_r$		3		$\mu\text{s}$
	$I_F = 5\text{ mA}$	SFH615A-4	$t_r$		4		$\mu\text{s}$
Turn-off time	$I_F = 20\text{ mA}$	SFH615A-1	$t_{off}$		18		$\mu\text{s}$
	$I_F = 10\text{ mA}$	SFH615A-2	$t_{off}$		23		$\mu\text{s}$
		SFH615A-3	$t_{off}$		23		$\mu\text{s}$
	$I_F = 5\text{ mA}$	SFH615A-4	$t_{off}$		25		$\mu\text{s}$
Fall time	$I_F = 20\text{ mA}$	SFH615A-1	$t_f$		11		$\mu\text{s}$
	$I_F = 10\text{ mA}$	SFH615A-2	$t_f$		14		$\mu\text{s}$
		SFH615A-3	$t_f$		14		$\mu\text{s}$
	$I_F = 5\text{ mA}$	SFH615A-4	$t_f$		15		$\mu\text{s}$

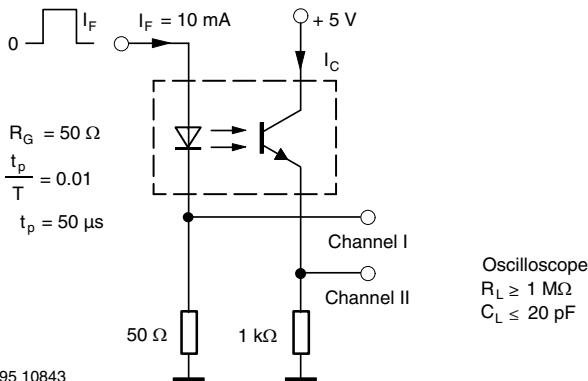


95 10804-3

Fig. 1 - Test Circuit, Non-Saturated Operation



Fig. 3 - Switching Times



95 10843

Fig. 2 - Test Circuit, Saturated Operation

SAFETY AND INSULATION RATINGS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Climatic classification (according to IEC 68 part 1)				55/100/21		
Comparative tracking index		CTI	175		399	
Rated impulse voltage		$V_{IOTM}$			8	kV
Maximum working voltages	Recurring peak voltage	$V_{IORM}$			890	V
Forward current		$I_{SI}$			275	mA
Power dissipation		$P_{SO}$			400	mW
Safety temperature		$T_{SI}$			175	°C
Creepage distance			7.0			mm
Clearance distance			7.0			mm
Isolation distance	per IEC 60950 2.10.5.1		0.4			mm

**Note**

- According to DIN EN 60747-5-5 (VDE 0884-5). These optocouplers are suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)



Fig. 4 - Forward Voltage vs. Forward Current



Fig. 7 - Leakage Current vs. Ambient Temperature

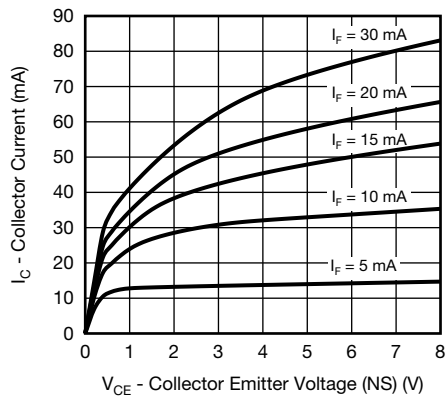


Fig. 5 - Collector Current vs. Collector Emitter Voltage (NS)



Fig. 8 - Normalized CTR (NS) vs. Ambient Temperature



Fig. 6 - Collector Current vs. Collector Emitter Voltage (sat)



Fig. 9 - Normalized CTR (sat) vs. Ambient Temperature



Fig. 10 - Normalized CTR (NS) vs. Forward Current



Fig. 13 - CTR Frequency vs. Collector Current



Fig. 11 - Normalized CTR (sat) vs. Forward Current



Fig. 14 - Switching Time vs. Load Resistance



Fig. 12 - CTR Frequency vs. Phase Angle



PACKAGE DIMENSIONS in millimeters



Option 6

Option 7

Option 9



20802-28

PACKAGE MARKING (Example)



Notes

- VDE logo is only marked on option 1 parts. Option information is not marked on the part.
- Tape and reel suffix (T) is not part of the package marking.

**PACKING INFORMATION**

DEVICE PER TUBE			
TYPE	UNITS/TUBE	TUBES/BOX	UNITS/BOX
DIP-4	100	40	4000

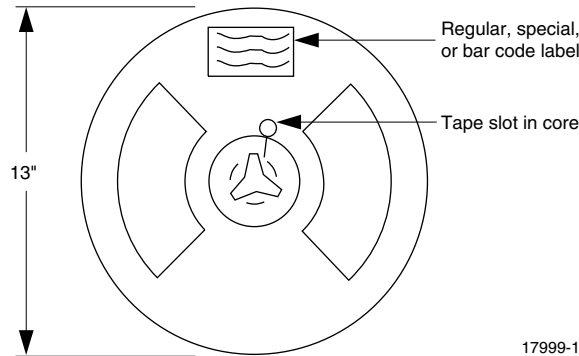


Fig. 15 - Tape and Reel Shipping Medium

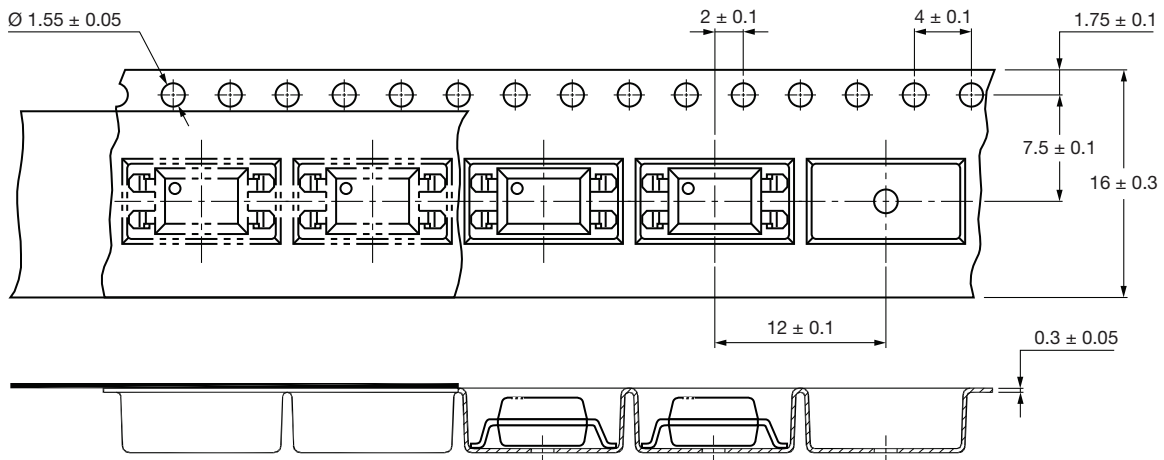


Fig. 16 - Tape and Packing for Option 7 and Option 9

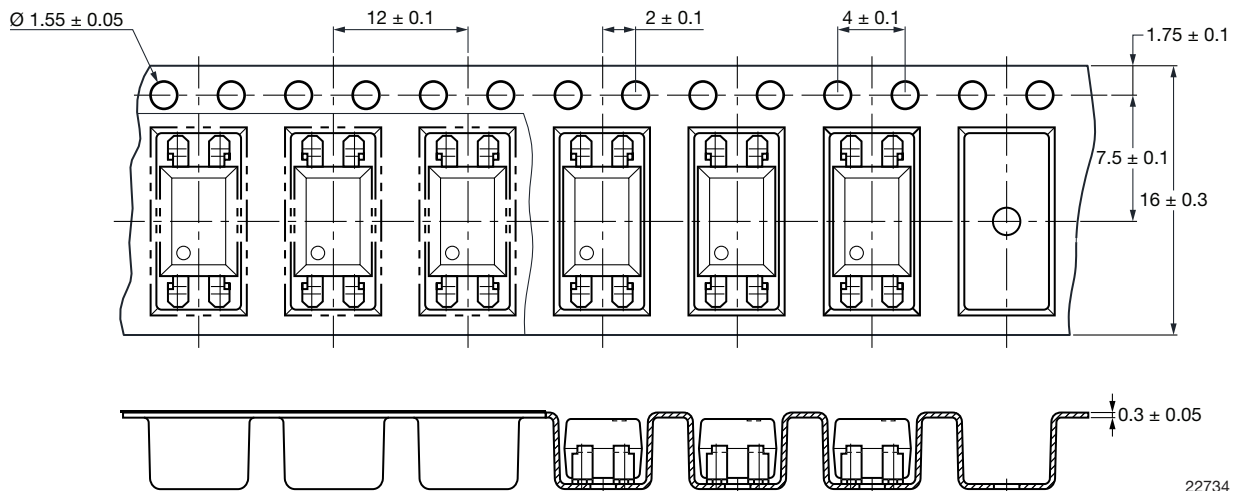


Fig. 17 - Tape Packing for Option 7 and Option 9, T3 Rotation (2000 units per reel)





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