



ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Reverse voltage		V _R	6	V
DC forward current		I _F	60	mA
Forward surge current	t _p ≤ 10 μs	I _{FSM}	2.5	A
LED power dissipation	at 25 °C	P _{diss}	70	mW
OUTPUT				
Collector emitter voltage		V _{CEO}	70	V
Emitter collector voltage		V _{ECO}	7	V
Collector current		I _C	50	mA
Collector peak current	t _p /T = 0.5, t _p ≤ 10 ms	I _{CM}	100	mA
Output power dissipation	at 25 °C	P _{diss}	150	mW
COUPLER				
Operation temperature		T _{amb}	-55 to +100	°C
Storage temperature range		T _{stg}	-55 to +150	°C
Soldering temperature ⁽¹⁾	2 mm from case, ≤ 10 s	T _{slid}	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.

⁽¹⁾ 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 _{amb} = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT							
Forward voltage	I _F = 60 mA		V _F		1.35	1.65	V
Reverse current	V _R = 6 V		I _R		0.01	10	μA
Capacitance	V _R = 0 V, f = 1 MHz		C _O		13		pF
OUTPUT							
Collector emitter capacitance	V _{CE} = 5 V, f = 1 MHz		C _{CE}		5.2		pF
Collector emitter leakage current	V _{CE} = 10 V	SFH615A-1	I _{CEO}		2	50	nA
		SFH615A-2	I _{CEO}		2	50	nA
		SFH615A-3	I _{CEO}		5	100	nA
		SFH615A-4	I _{CEO}		5	100	nA
COUPLER							
Collector emitter saturation voltage	I _F = 10 mA, f = 1 MHz		V _{CEsat}		0.25	0.4	V
Coupling capacitance			C _C		0.4		pF

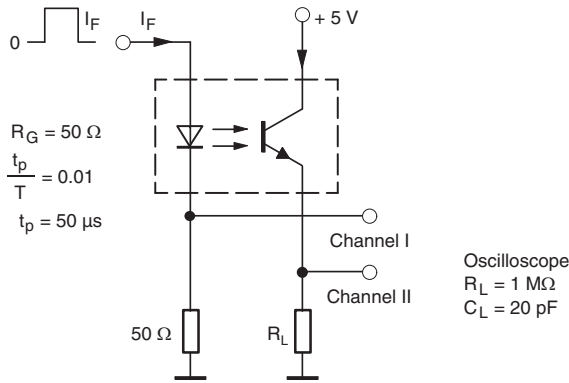
Note

- 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.



CURRENT TRANSFER RATIO ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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		%

SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
NON-SATURATED							
Turn-on time	$I_F = 10\text{ mA}$, $V_{CC} = 5\text{ V}$, $R_L = 75\text{ }\Omega$		t_{on}		3		μs
Rise time	$I_F = 10\text{ mA}$, $V_{CC} = 5\text{ V}$, $R_L = 75\text{ }\Omega$		t_r		2		μs
Turn-off time	$I_F = 10\text{ mA}$, $V_{CC} = 5\text{ V}$, $R_L = 75\text{ }\Omega$		t_{off}		2.3		μs
Fall time	$I_F = 10\text{ mA}$, $V_{CC} = 5\text{ V}$, $R_L = 75\text{ }\Omega$		t_f		2		μs
Cut-off frequency	$I_F = 10\text{ mA}$, $V_{CC} = 5\text{ V}$, $R_L = 75\text{ }\Omega$		f_{CO}		208		kHz
SATURATED							
Turn-on time	$I_F = 20\text{ mA}$	SFH615A-1	t_{on}		3		μs
	$I_F = 10\text{ mA}$	SFH615A-2	t_{on}		4.2		μs
		SFH615A-3	t_{on}		4.2		μs
	$I_F = 5\text{ mA}$	SFH615A-4	t_{on}		6		μs
Rise time	$I_F = 20\text{ mA}$	SFH615A-1	t_r		2		μs
	$I_F = 10\text{ mA}$	SFH615A-2	t_r		3		μs
		SFH615A-3	t_r		3		μs
	$I_F = 5\text{ mA}$	SFH615A-4	t_r		4		μs
Turn-off time	$I_F = 20\text{ mA}$	SFH615A-1	t_{off}		18		μs
	$I_F = 10\text{ mA}$	SFH615A-2	t_{off}		23		μs
		SFH615A-3	t_{off}		23		μs
	$I_F = 5\text{ mA}$	SFH615A-4	t_{off}		25		μs
Fall time	$I_F = 20\text{ mA}$	SFH615A-1	t_f		11		μs
	$I_F = 10\text{ mA}$	SFH615A-2	t_f		14		μs
		SFH615A-3	t_f		14		μs
	$I_F = 5\text{ mA}$	SFH615A-4	t_f		15		μs



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Fig. 1 - Test Circuit, Non-Saturated Operation

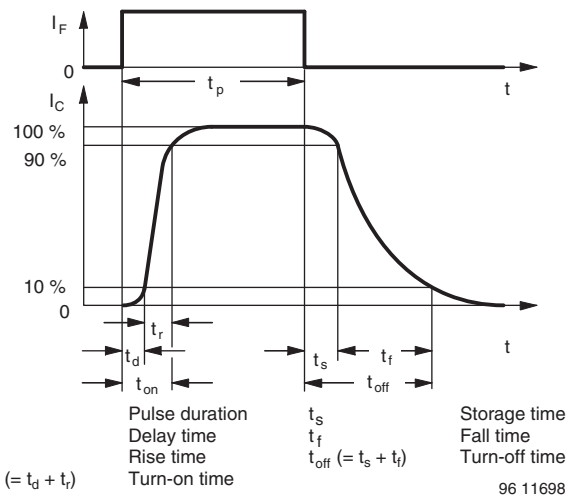
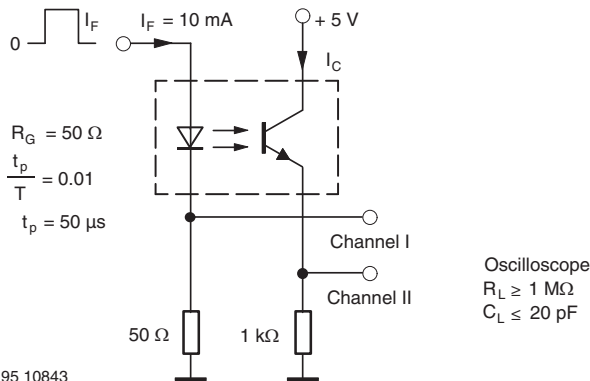


Fig. 3 - Switching Times



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Fig. 2 - Test Circuit, Saturated Operation

SAFETY AND INSULATION RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Climatic classification	According to IEC 68 part 1		55/115/21	
Pollution degree	According to DIN VDE 0109		2	
Comparative tracking index	Insulation group IIIa	CTI	175	
Maximum rated withstanding isolation voltage	According to UL1577, t = 1 min	V _{ISO}	4470	V _{RMS}
Tested withstanding isolation voltage	According to UL1577, t = 1 s	V _{ISO}	5300	V _{RMS}
Maximum transient isolation voltage	According to DIN EN 60747-5-5	V _{IOTM}	8000	V _{peak}
Maximum repetitive peak isolation voltage	According to DIN EN 60747-5-5	V _{IORM}	890	V _{peak}
Isolation resistance	T _{amb} = 25 °C, V _{IO} = 500 V	R _{IO}	≥ 10 ¹²	Ω
	T _{amb} = 100 °C, V _{IO} = 500 V	R _{IO}	≥ 10 ¹¹	Ω
Output safety power		P _{SO}	700	mW
Input safety current		I _{SI}	400	mA
Input safety temperature		T _S	175	°C
Creepage distance	DIP-4		≥ 7	mm
Clearance distance	DIP-4		≥ 7	mm
Creepage distance	DIP-4, 400 mil, option 6		≥ 8	mm
Clearance distance	DIP-4, 400 mil, option 6		≥ 8	mm
Creepage distance	SMD-4, option 7 and option 9		≥ 7	mm
Clearance distance	SMD-4, option 7 and option 9		≥ 7	mm
Insulation thickness		DTI	≥ 0.4	mm

Note

- As per DIN EN 60747-5-5, § 7.4.3.8.2, this optocoupler is 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)

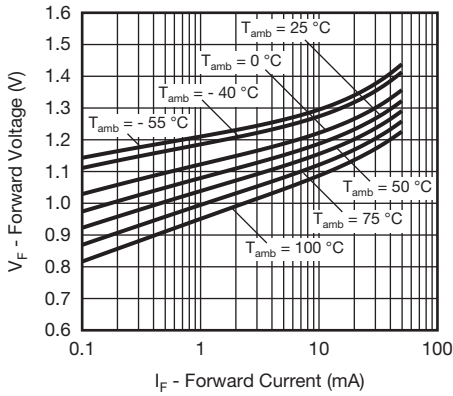


Fig. 4 - Forward Voltage vs. Forward Current

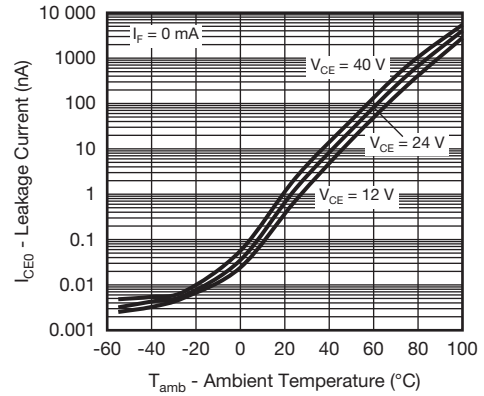


Fig. 7 - Leakage Current vs. Ambient Temperature

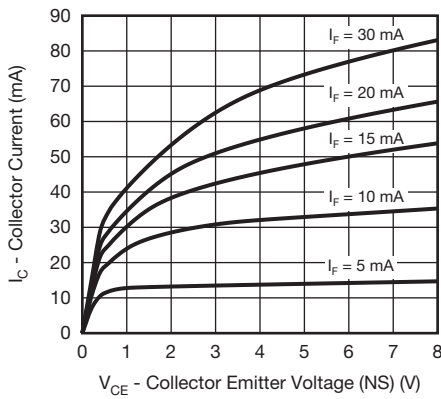


Fig. 5 - Collector Current vs. Collector Emitter Voltage (non-saturated)

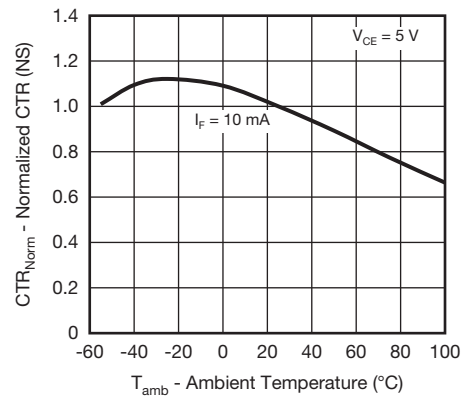


Fig. 8 - Normalized CTR (non-saturated) vs. Ambient Temperature

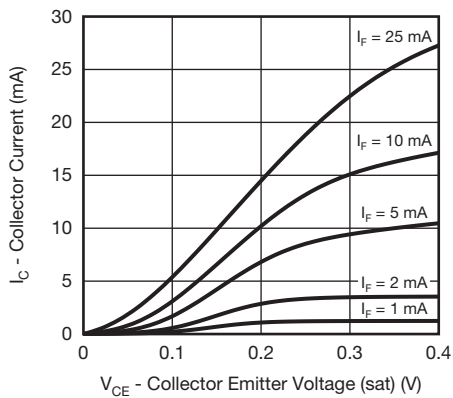


Fig. 6 - Collector Current vs. Collector Emitter Voltage (saturated)

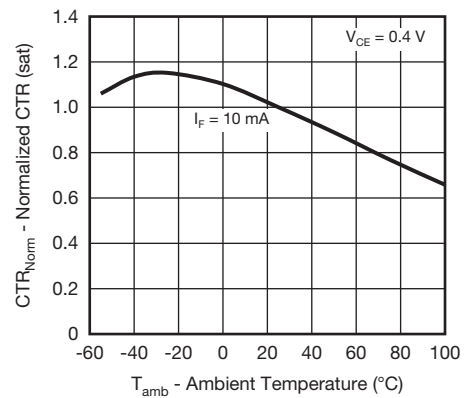


Fig. 9 - Normalized CTR (saturated) vs. Ambient Temperature

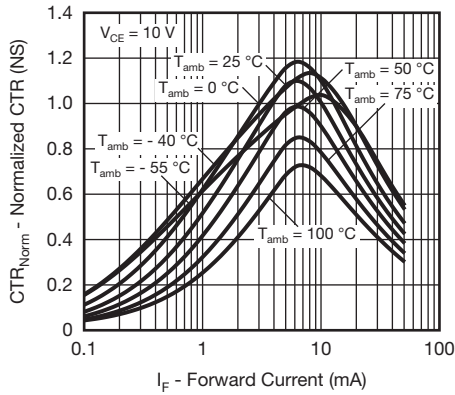


Fig. 10 - Normalized CTR (non-saturated) vs. Forward Current

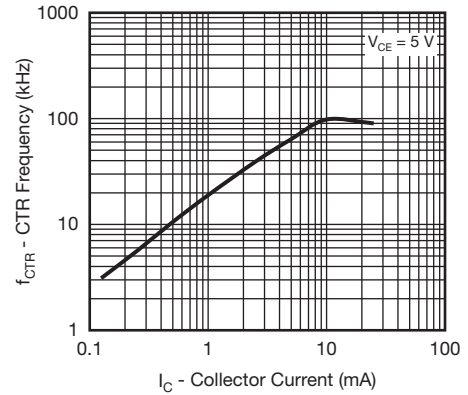


Fig. 13 - Cut-Off Frequency vs. Collector Current

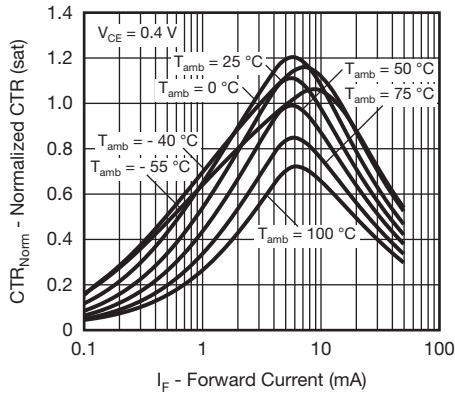


Fig. 11 - Normalized CTR (saturated) vs. Forward Current

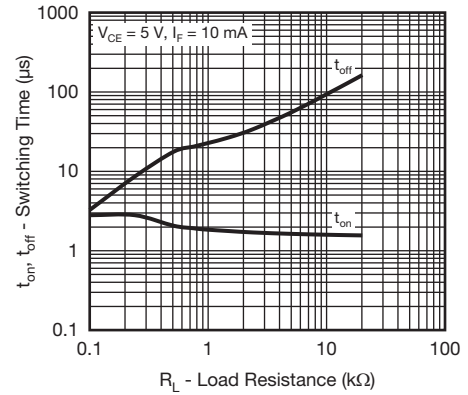


Fig. 14 - Switching Time vs. Load Resistance

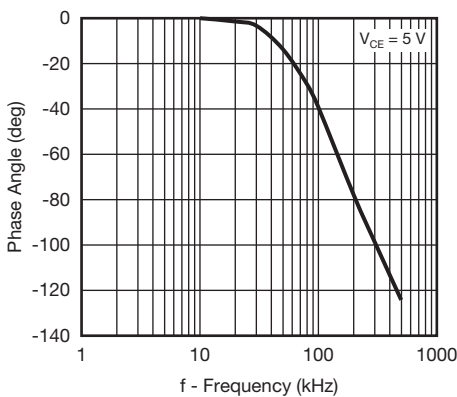
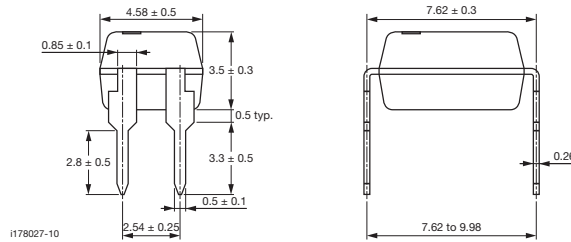
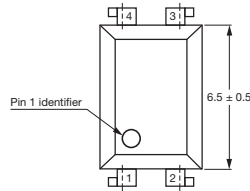


Fig. 12 - Phase Angle vs. Frequency



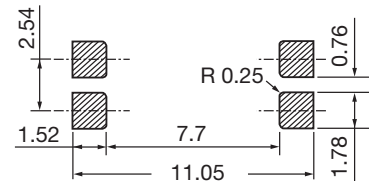
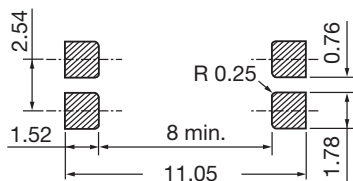
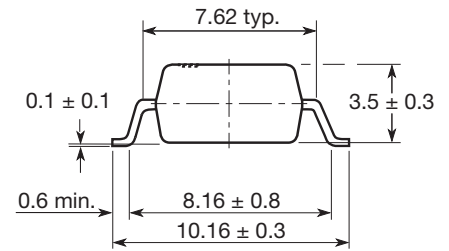
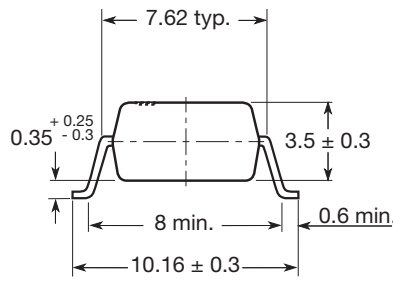
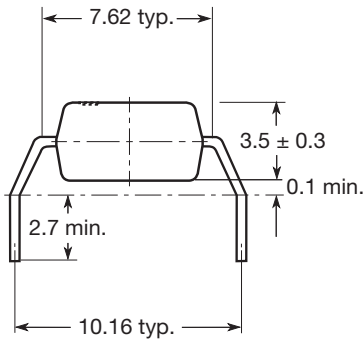
PACKAGE DIMENSIONS in millimeters



Option 6

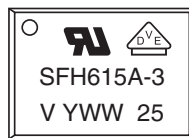
Option 7

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

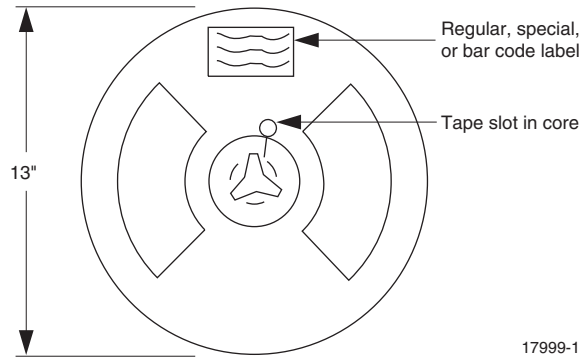


Fig. 15 - Tape and Reel Shipping Medium

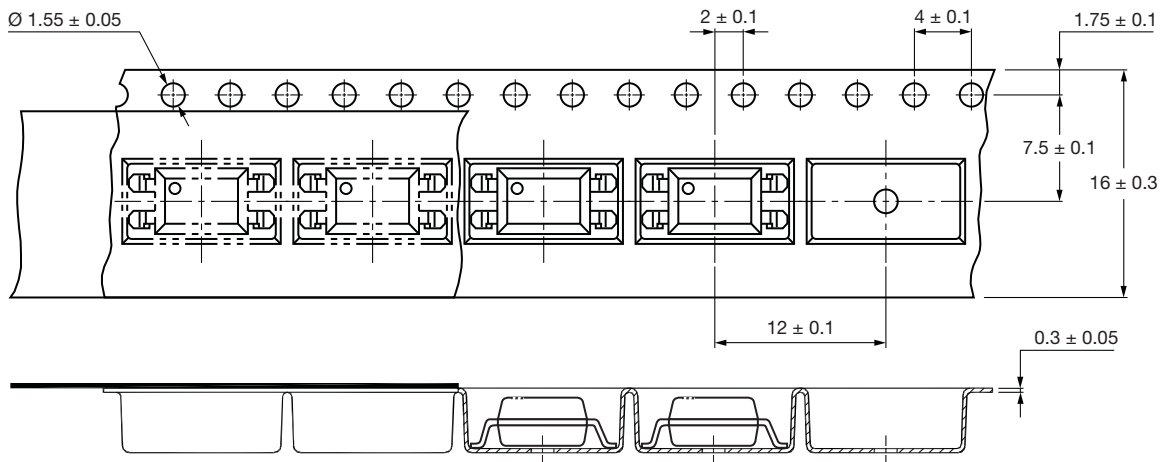


Fig. 16 - Tape and Packing for Option 7 and Option 9

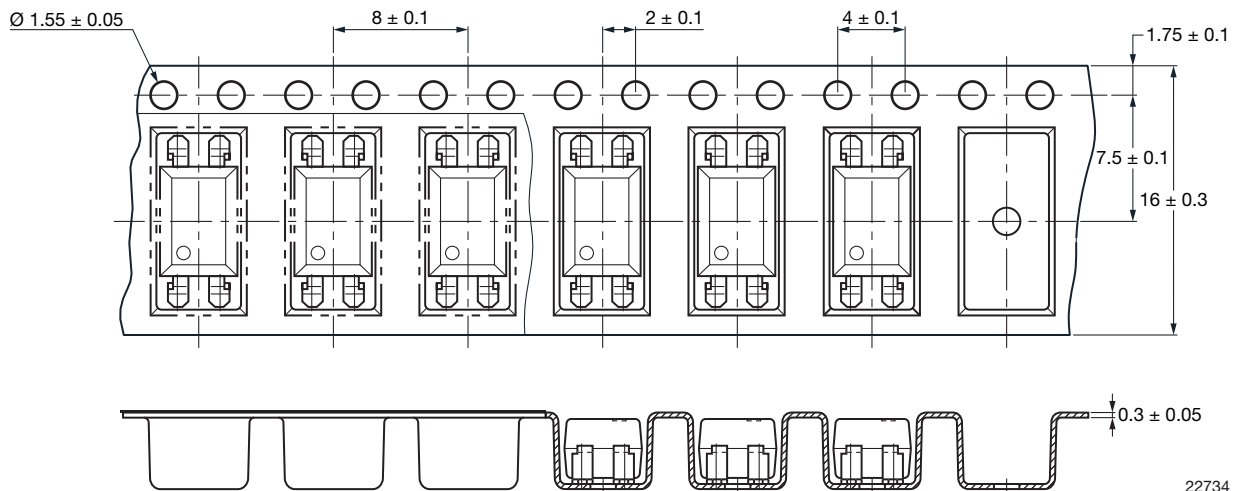


Fig. 17 - Tape Packing for Option 7 and Option 9, T3 Rotation (2000 units per reel)

SOLDER PROFILES

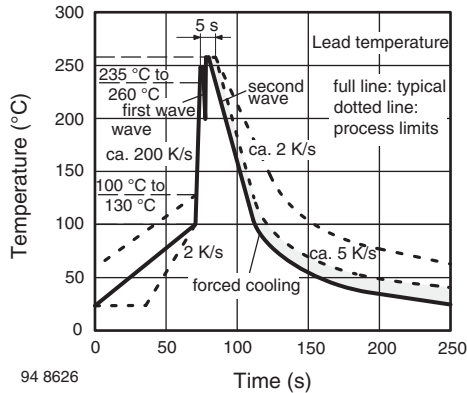


Fig. 18 - Wave Soldering Double Wave Profile According to J-STD-020 for DIP-8 Devices

HANDLING AND STORAGE CONDITIONS

ESD level: HBM class 2

Floor life: unlimited

Conditions: $T_{amb} < 30\text{ °C}$, RH < 85 %

Moisture sensitivity level 1, according to J-STD-020

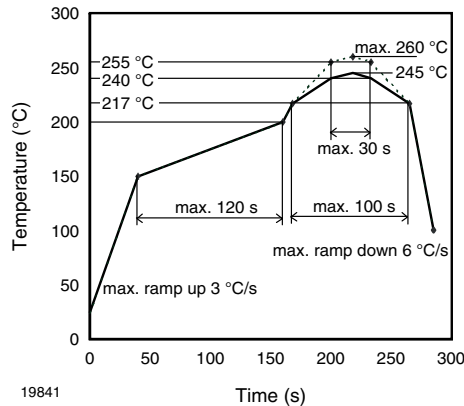


Fig. 19 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020 for SMD-8 Devices



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