

Opto-Coupler with Photo-Triac Output

The SL301X, SL302X and SL305X series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon random-phase photo triac in a plastic DIP6 package with different lead forming options. With the robust coplanar double mold structure, SL 301X, SL 302X and SL 305X series provide the most stable isolation feature.

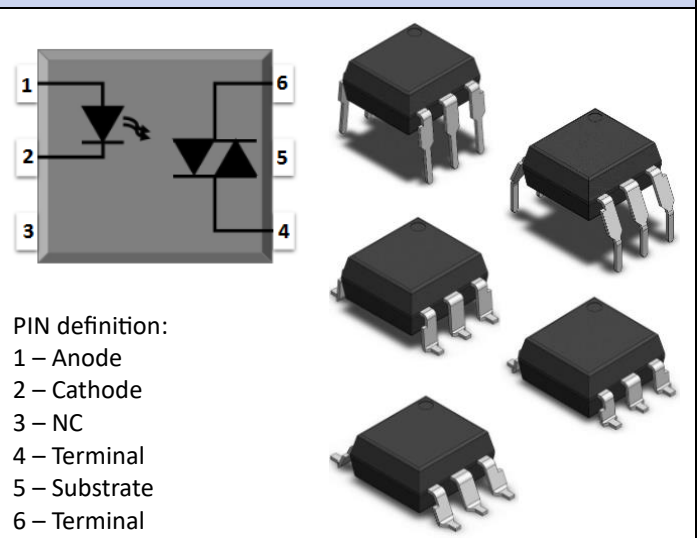
Features

- Pb-Free and **RoHS** Compliant
- DC input with random-phase photo-triac output
- High isolation voltage 5000Vrms
- 0.4mm isolation distance (0.4mm min.)

Applications

- Solenoid/valve controls
- Lighting controls
- Motor controls
- Temperature controls
- Static AC power switches
- Solid state relays
- Interfacing microprocessors to 115 to 240VAC peripherals

Schematic, pin definition, package outline



PIN definition:

- 1 – Anode
- 2 – Cathode
- 3 – NC
- 4 – Terminal
- 5 – Substrate
- 6 – Terminal

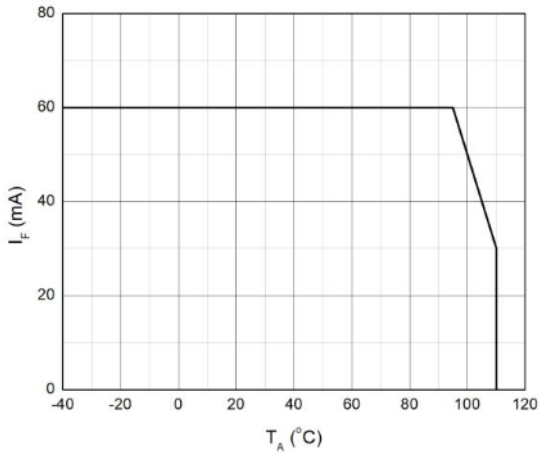
Part numbering system			
SL30	2	2	D
↓ Series code	↓ V _{DRM} indicator (see: Absolute maximum ratings)	↓ I _{FT} indicator (see: Electrical and optical characteristics)	↓ Package indicator D – DIP6 THT M – Gullwing THT S – SMT SL – SMT low profile (see: Case dimensions)

Absolute maximum ratings				
Characteristic		Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Reverse voltage	V_R	6	V
	Junction temperature	T_{J-IN}	125	°C
	Input power dissipation	P_{IN}	100	mW
Output	Off-state output terminal voltage	SL301x	250	V
		SL302x	400	
		SL305x	600	
	Peak repetitive surge current (PW=100μs, 120pps)	I_{TSM}	1.0	A
	Junction temperature	T_{J-OUT}	125	°C
	Output power dissipation	P_{OUT}	300	mW
Operating temperature range		T_{OPR}	-40 ~ 100	°C
Storage temperature range		T_{STG}	-55 ~ 125	°C
Soldering temperature (10 seconds)		T_{sol}	260	°C
Total power dissipation		P_{tot}	400	mW
Isolation voltage (AC for 1 minute, RH: 40~60%)		V_{ISO}	5000	V_{rms}

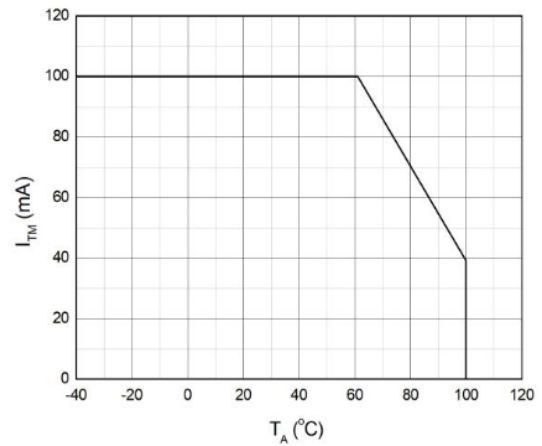
Electrical and optical characteristics							
Characteristic		Symbol	Test conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	$I_F=10mA$	-	1.24	1.4	V
	Reverse current	I_R	$V_R=6.0V$	-	-	10	μA
	Input capacitance	C_{in}	$V=0, f=1.0kHz$	-	8.5	250	pF
Output	Peak ON-state voltage, either direction	V_{TM}	$I_{TM}=100mA$	-	1.58	2.5	V
	Critical rate of rise of OFF-state voltage (Refer to Test circuits of dV/dt and Waveforms of dV/dt)	dV/dt	$V_{PEAK}=rated V_{DRM}$	1000	-	-	V
	Peak OFF-state current, either direction (test voltage must be applied within dV/dt rating)	I_{DRM}	$V_{DRM}=rated V_{DRM}$ $I_F=0$	-	-	100	nA
Transfer characteristics	LED trigger current	SL3010, SL3021, SL3051	Terminal voltage = 3.0V $I_{TM}=100mA$	-	-	15	mA
		SL3011, SL3022, SL3052		-	-	10	
		SL3012, SL3023, SL3053		-	-	5.0	
	Holding current	I_H		-	257	-	μA
	Isolation resistance	R_{iso}	$V=500VDC, RH: 40\sim 60\%$	10^{12}	10^{14}	-	Ω
Floating capacitance	C_{IO}	$V=0, f=1.0MHz$	-	800	-	nF	

Characteristic curves

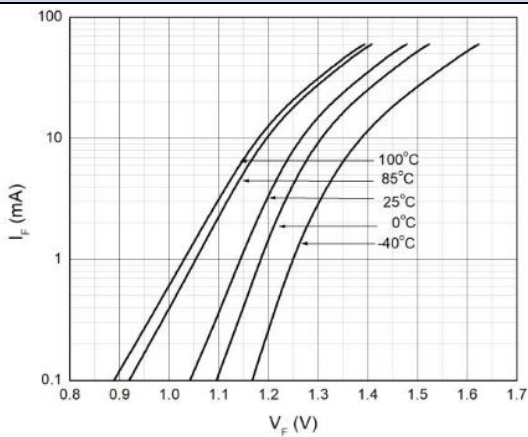
Forward current vs. ambient temperature



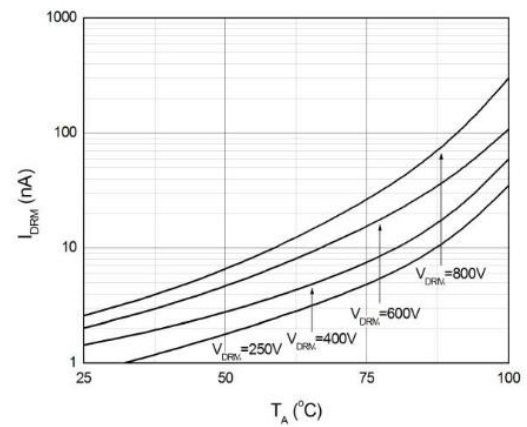
ON-state terminal current vs. ambient temperature



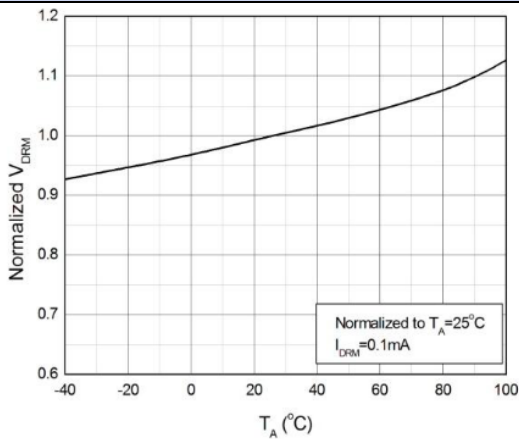
Forward current vs. forward voltage



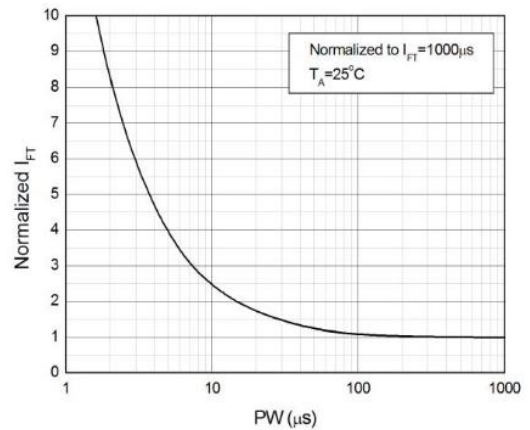
OFF-state terminal current vs. ambient temperature



Normalized OFF-state terminal voltage vs. ambient temperature

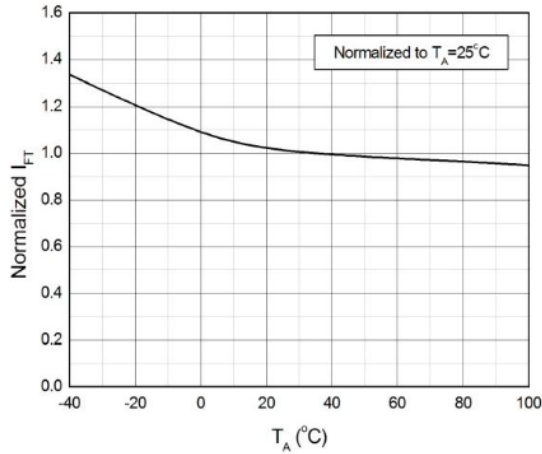


Normalized trigger current vs. LED trigger pulse width

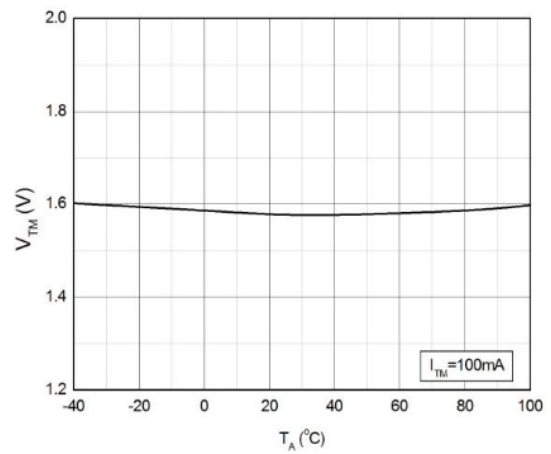


Characteristic curves

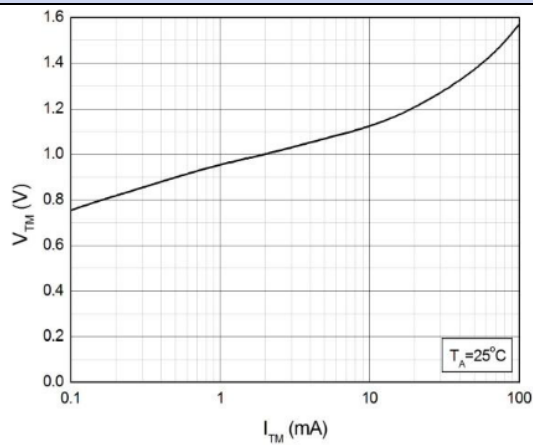
Normalized trigger current vs. ambient temperature



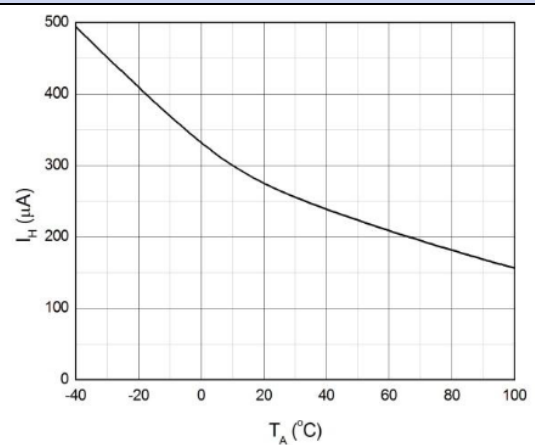
ON-state terminal voltage vs. ambient temperature



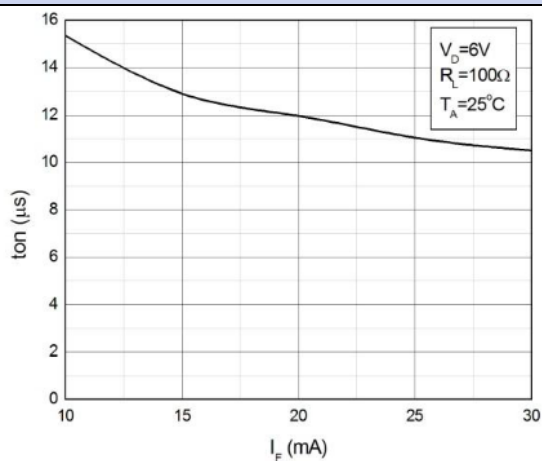
ON-state terminal voltage vs. ON-state terminal current



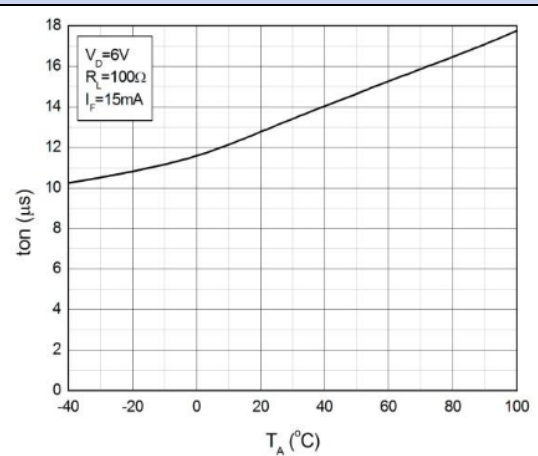
Holding current vs. ambient temperature

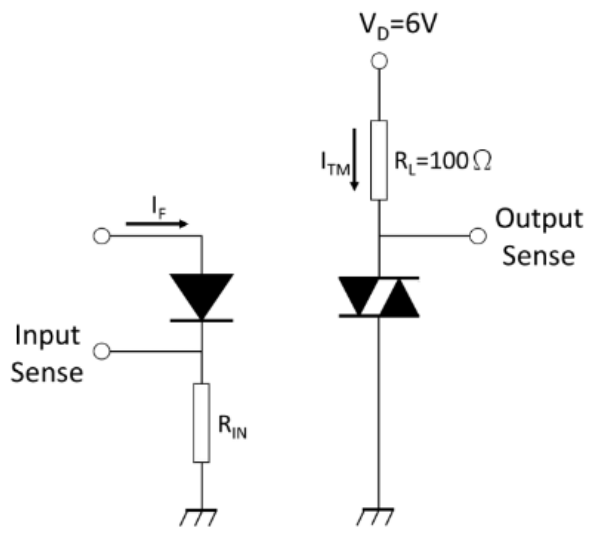
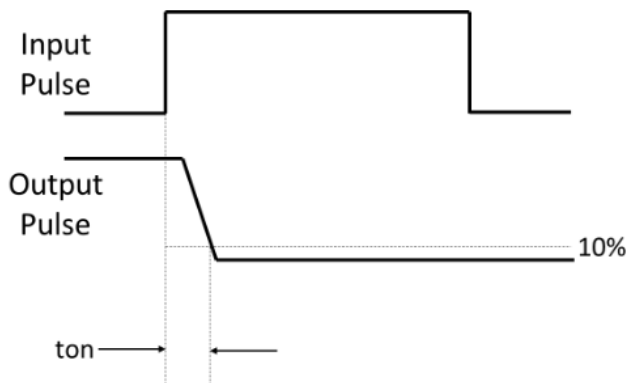
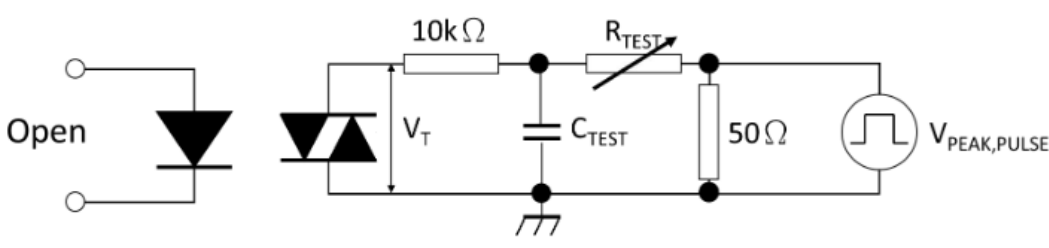
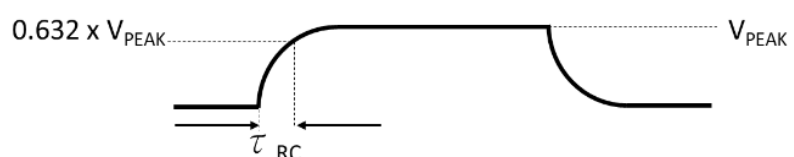


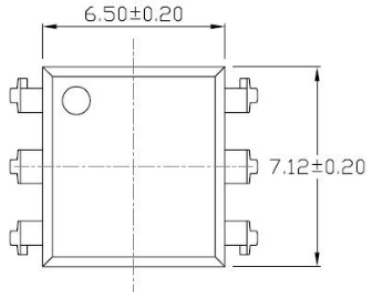
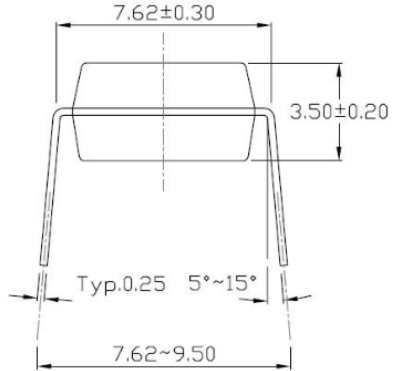
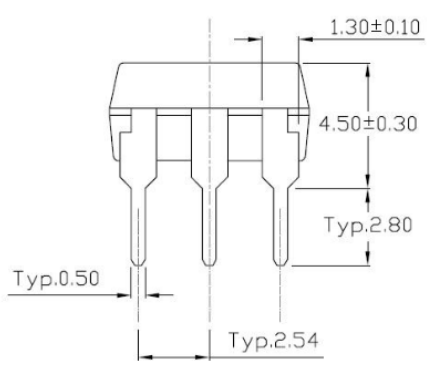
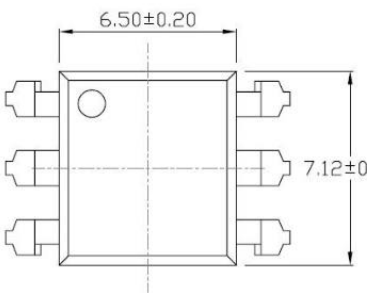
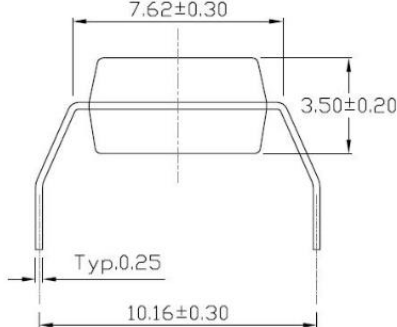
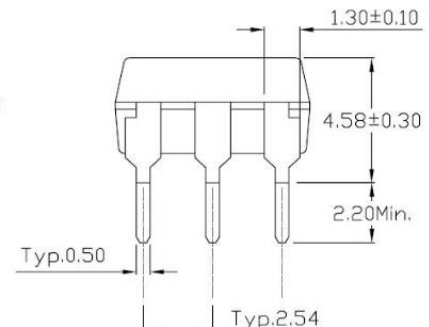
Turn ON time vs. forward current

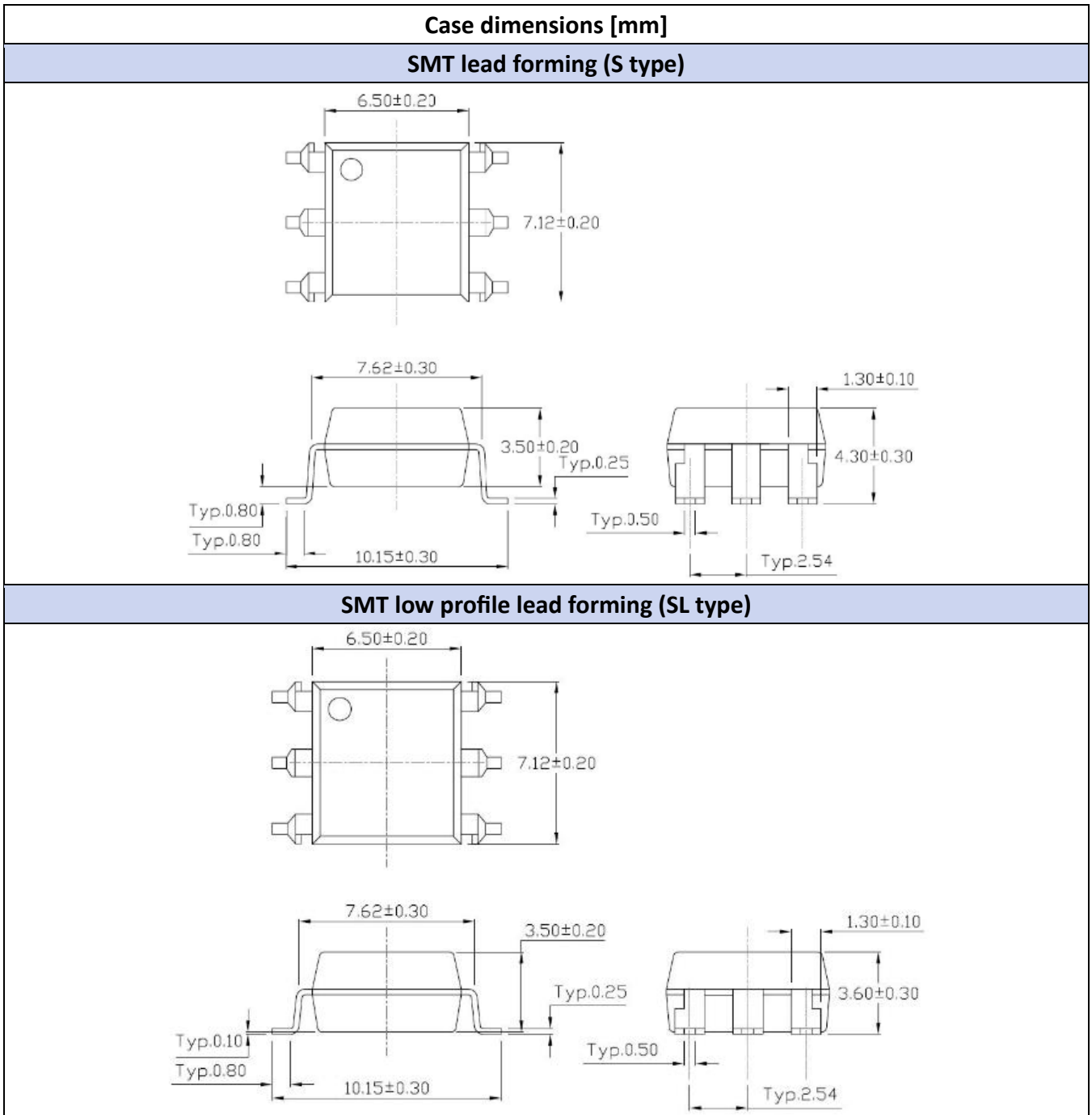


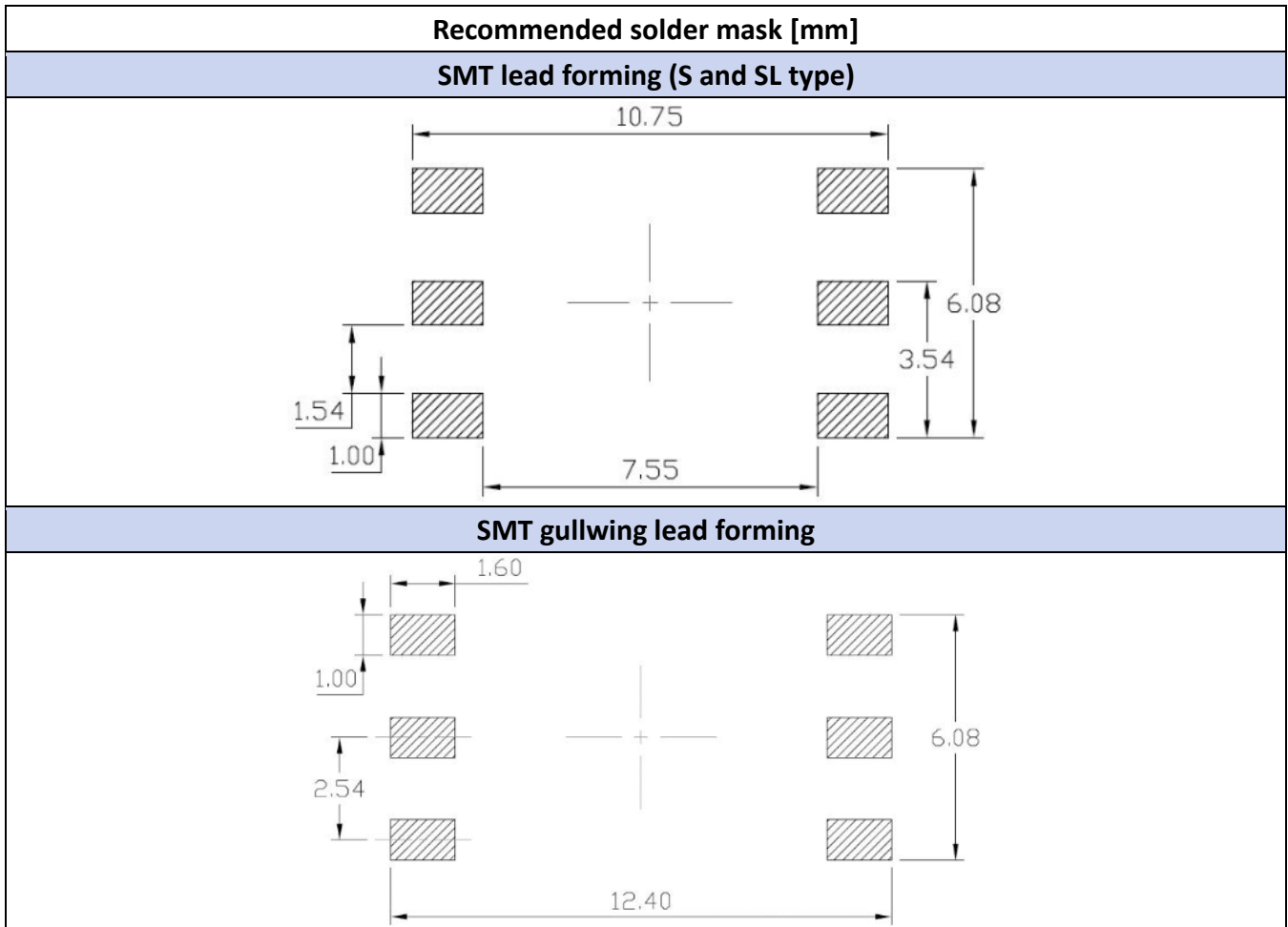
Turn ON time vs. ambient temperature



Test circuits	
Test circuits of turn ON time	Waveforms of turn ON time
	
Test circuits of dV/dt	
	
$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$	

Case dimensions [mm]	
Standard DIP – THT (D type)	
	
	
Gullwing (400mil) lead forming – THT (M type)	
	
	





Ordering information			
Part Number	Package	Shipping Quantity	Dimensions
SL301xD ~ SL305xD	DIP6	65 pcs / tube 1600 pcs / box	---
SL301xM ~ SL305xM	THT Gullwing	Coming soon	---
SL301xS ~ SL305xS	SMT	1000 pcs / reel	---
SL301xSL ~ SL305xSL	SMT low profile	Coming soon	---

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