

## 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.

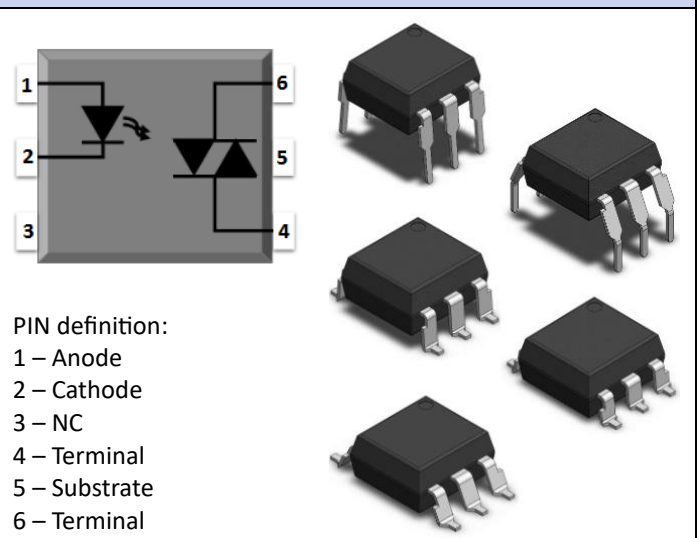
### Features

- 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

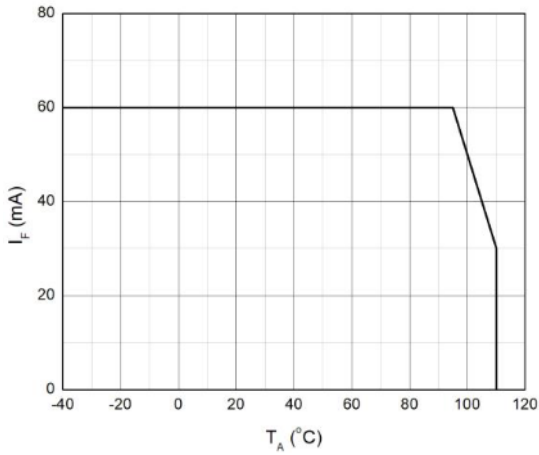
Part numbering system			
SL30	2	2	D
↓ Series code	↓ V <sub>DRM</sub> indicator (see: <a href="#">Absolute maximum ratings</a> )	↓ I <sub>FT</sub> indicator (see: <a href="#">Electrical and optical characteristics</a> )	↓ Package indicator D – DIP6 THT M – Gullwing THT S – SMT SL – SMT low profile (see: <a href="#">Case dimensions</a> )

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	$V_{rms}$

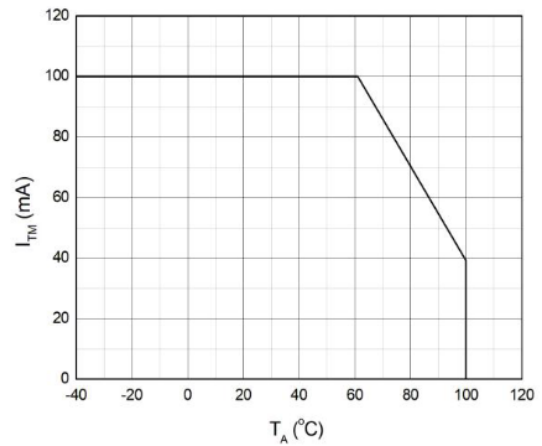
Electrical and optical characteristics							
Characteristic		Symbol	Test conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	$V_F$	$I_F=10mA$	-	1.24	1.4	V
	Reverse current	$I_R$	$V_R=6.0V$	-	-	10	μA
	Input capacitance	$C_{in}$	$V=0, f=1.0kHz$	-	8.5	250	pF
Output	Peak ON-state voltage, either direction	$V_{TM}$	$I_{TM}=100mA$	-	1.58	2.5	V
	Critical rate of rise of OFF-state voltage (Refer to <a href="#">Test circuits of dV/dt</a> and <a href="#">Waveforms of dV/dt</a> )	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	$R_{iso}$	$V=500VDC, RH: 40\sim60\%$	$10^{12}$	$10^{14}$	-	Ω
Floating capacitance	$C_{IO}$	$V=0, f=1.0MHz$	-	800	-	nF	

## Characteristic curves

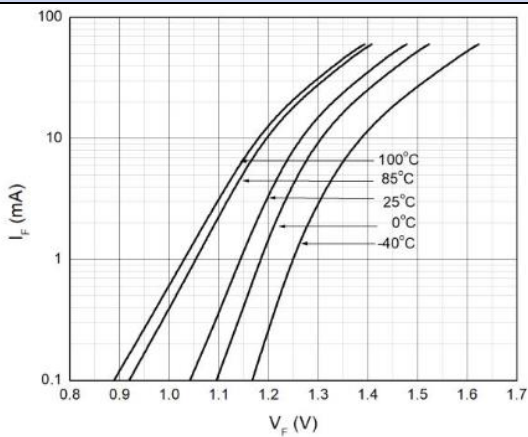
### Forward current vs. ambient temperature



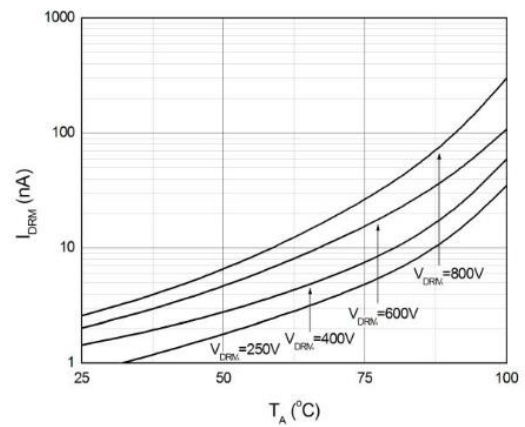
### ON-state terminal current vs. ambient temperature



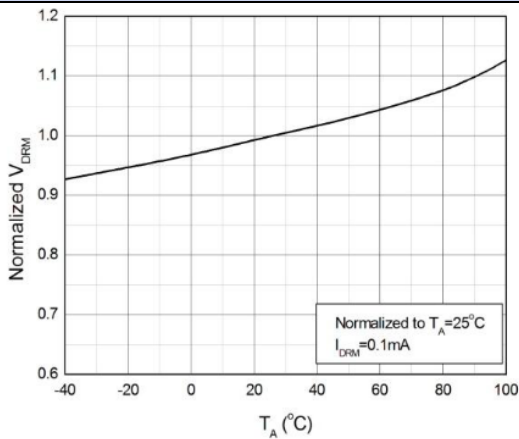
### Forward current vs. forward voltage



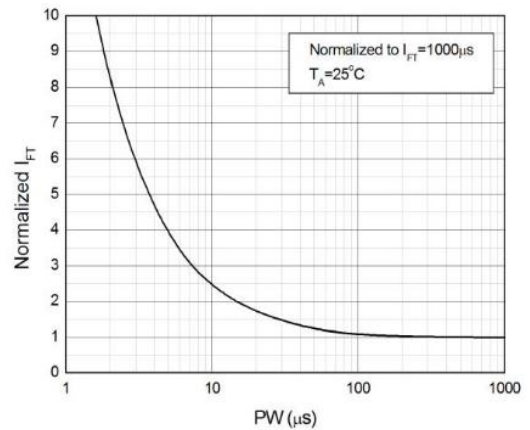
### OFF-state terminal current vs. ambient temperature



### Normalized OFF-state terminal voltage vs. ambient temperature

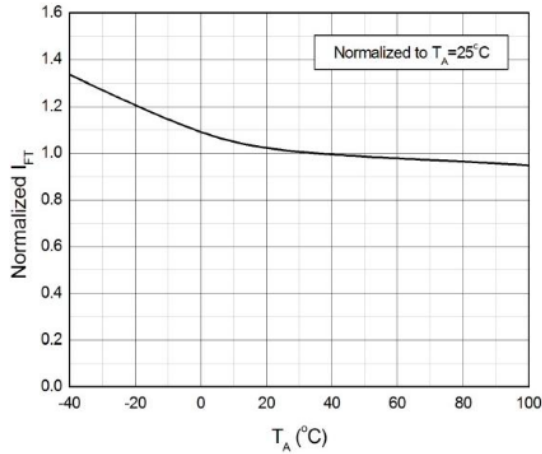


### Normalized trigger current vs. LED trigger pulse width

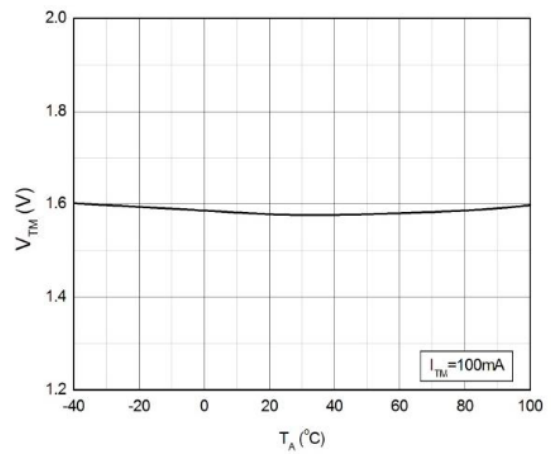


## Characteristic curves

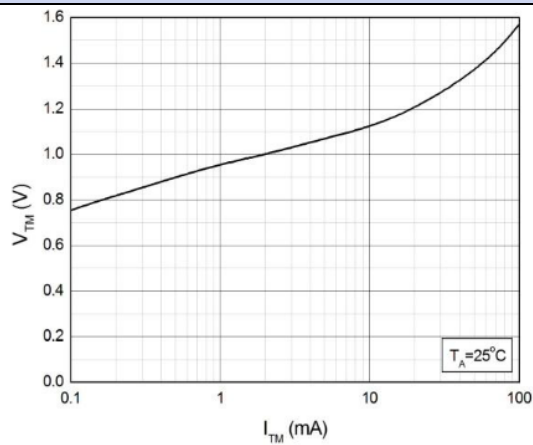
**Normalized trigger current vs. ambient temperature**



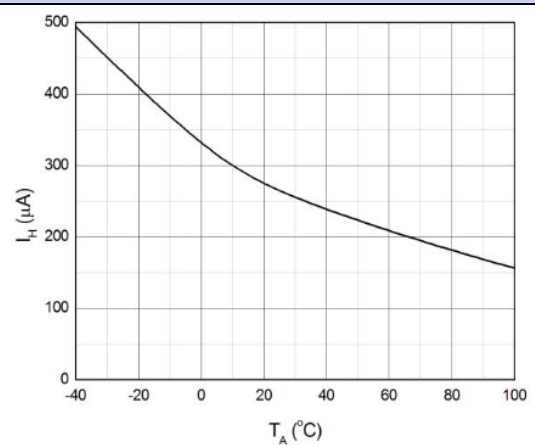
**ON-state terminal voltage vs. ambient temperature**



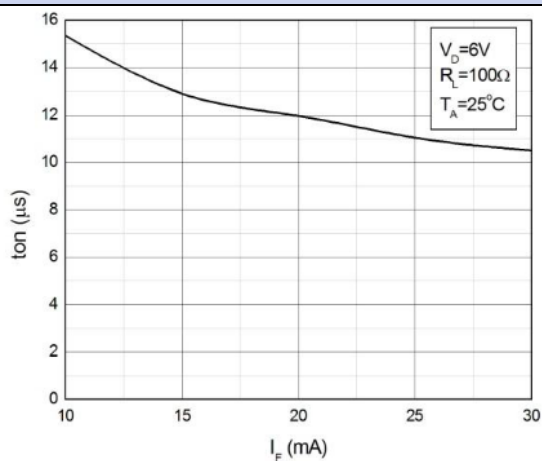
**ON-state terminal voltage vs. ON-state terminal current**



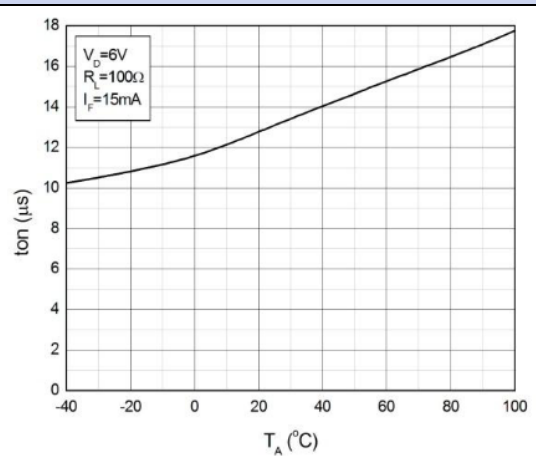
**Holding current vs. ambient temperature**

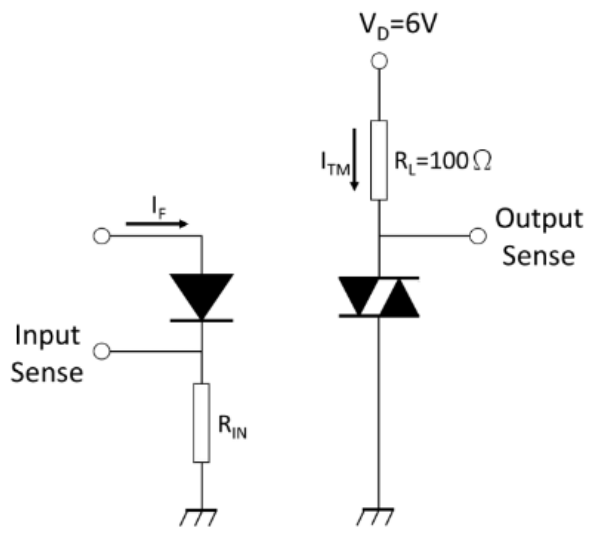
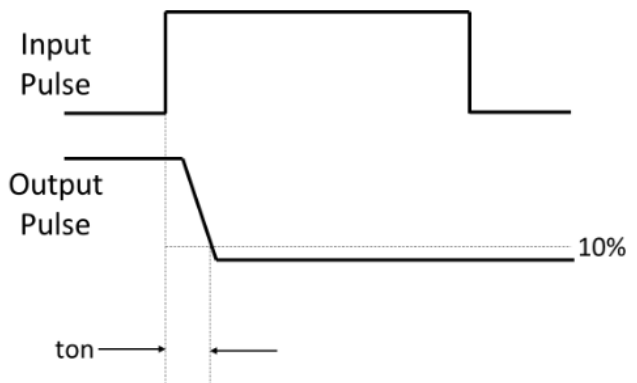
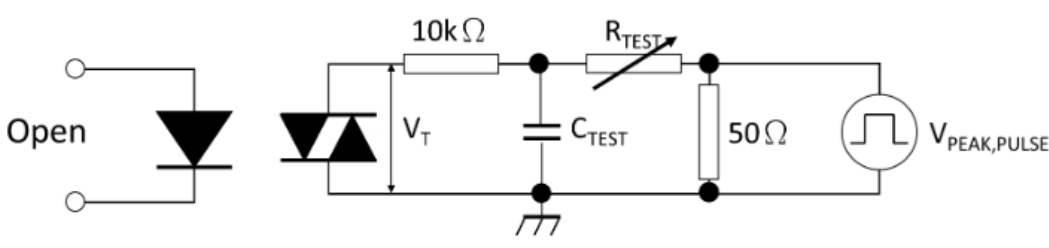
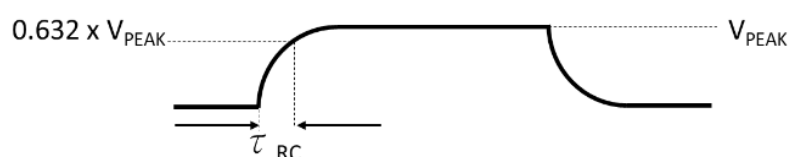


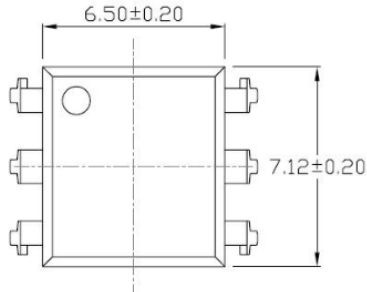
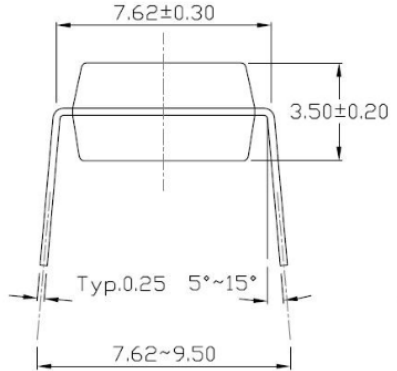
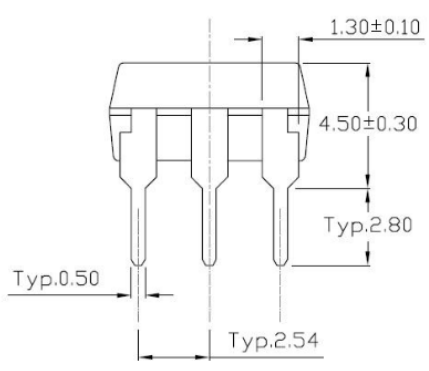
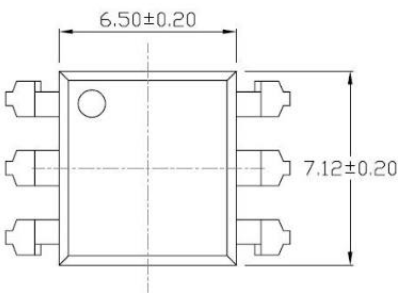
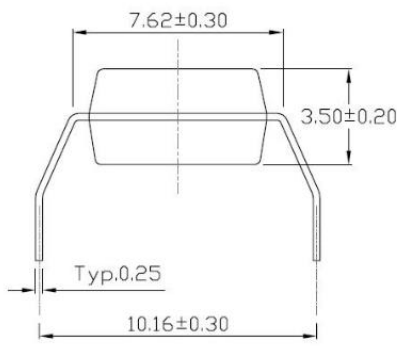
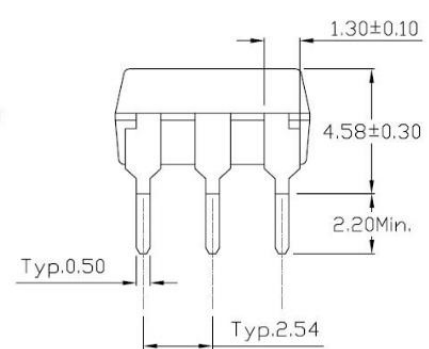
**Turn ON time vs. forward current**

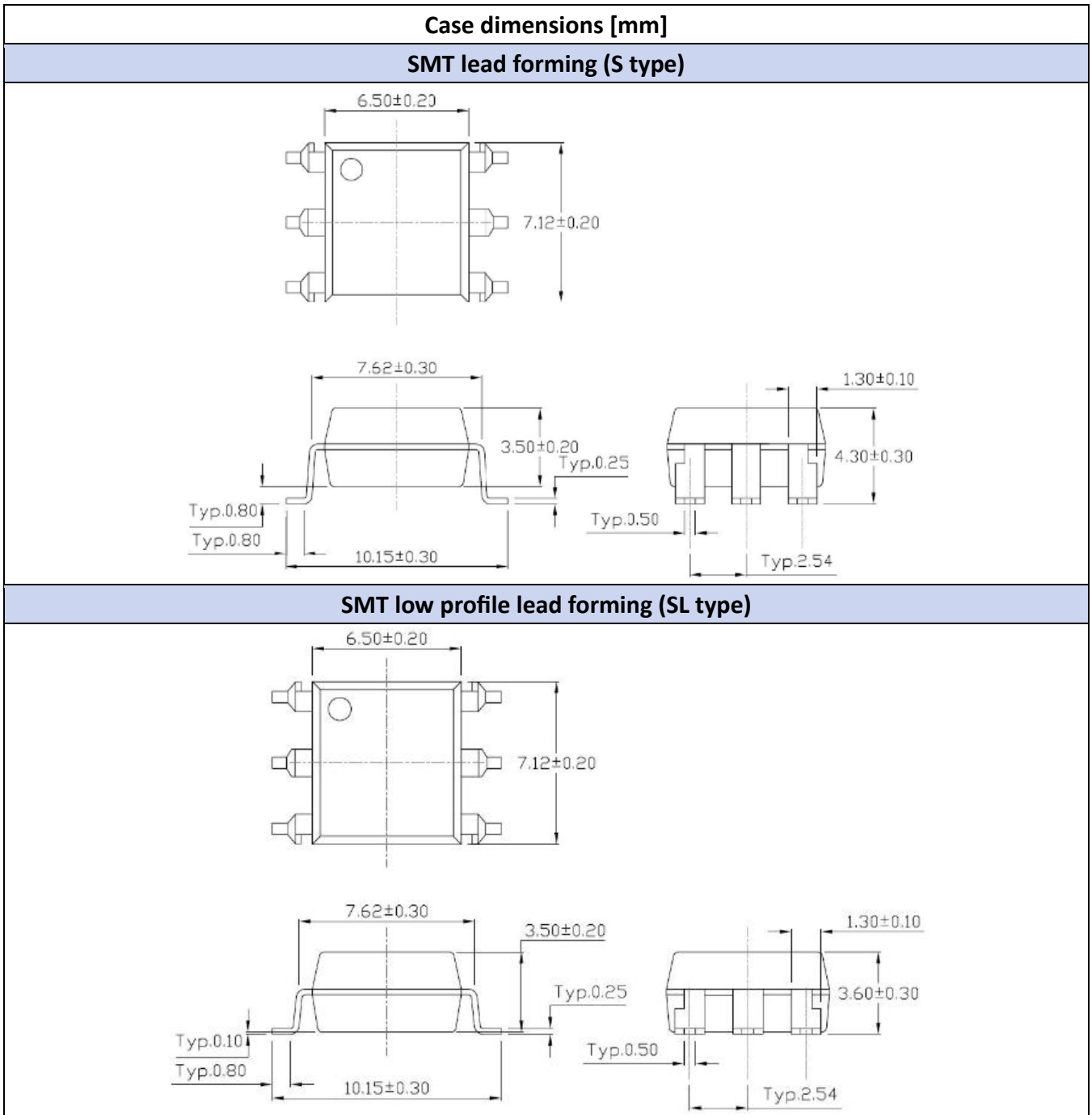


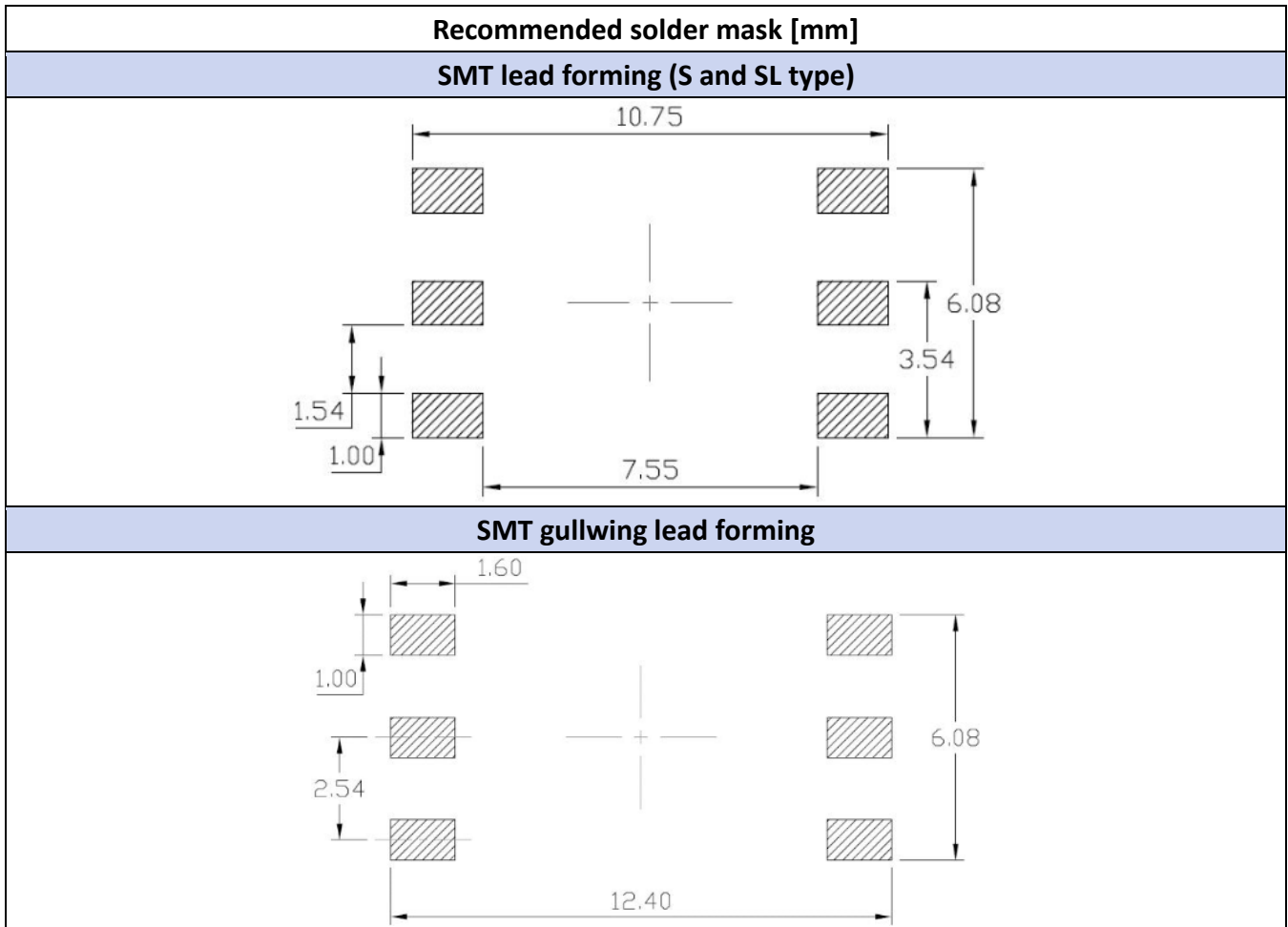
**Turn ON time vs. ambient temperature**



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	<b>65 pcs / tube</b> <b>1600 pcs / box</b>	---
SL301xM ~ SL305xM	THT Gullwing	Coming soon	---
SL301xS ~ SL305xS	SMT	<b>1000 pcs / reel</b>	---
SL301xSL ~ SL305xSL	SMT low profile	Coming soon	---

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