

Photo Darlington Transistor Coupler

Description

The SLM352 Series consists of a high efficient AlGaAs Light Emitting Diode and a silicon planar high voltage darlington phototransistor detector with plastic SOP4 package. The operating parameters are guaranteed over the temperature range of - 55 to 100

Applications

- Sequence controller
- PLC control
- System appliances ,measuring instrument
- Programmable logic controller

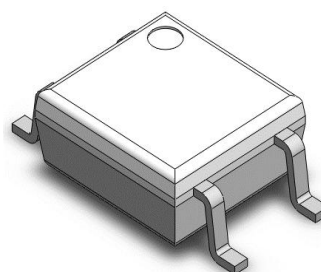
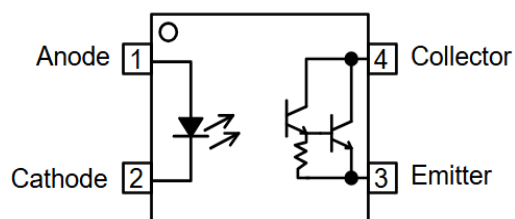
Fruth Table Positive Logic

LED	VO
ON	LOW
OFF	HIGH

Features

- High input-output isolation
3750 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Maximum collector current 150mA
- REACH compliance
- Halogen free

Functional Diagram



SLM352 SOP4

Absolute maximum ratings (TA = 25°C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT	NOTE
Forward Current	I _F	60	mA	
Peak Forward Current	I _{FP}	1	A	1
Reverse Voltage	V _R	6	V	
Input Power Dissipation	P _I	100	mW	
Collector - Emitter Voltage	V _{CEO}	350	V	
Emitter - Collector Voltage	V _{ECO}	0.1	V	
Collector Current	I _C	150	mA	
Output Power Dissipation	P _O	150	mW	
Total Power Dissipation	P _{tot}	200	mW	
Isolation Voltage	V _{iso}	3750	V _{rms}	2
Operating Temperature	T _{opr}	-55~100	°C	
Storage Temperature	T _{stg}	-55~125	°C	
Soldering Temperature	T _{sol}	260	°C	

Note 1. 100µs pulse, 100Hz frequency

Note 2. AC For 1 Minute, R.H. = 40 ~ 60%

Electrical Optical characteristics(TA = 25°C unless otherwise noted)

PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
Forward Voltage	V _F	-	1.24	1.4	V	I _F =10mA	
Reverse Current	I _R	-	-	10	µA	V _R =6V	
Input Capacitance	C _{in}	-	10	-	pF	V=0, f=1kHz	
Collector Dark Current	I _{CEO}	-	-	200	nA	V _{CE} =200V, I _F =0	
Collector-Emitter Breakdown Voltage	BV _{CEO}	350	-	-	V	I _C =0.1mA, I _F =0	
Emitter-Collector Breakdown Voltage	BV _{ECO}	0.1	-	-	V	I _E =0.1mA, I _F =0	

Transfer Characteristics (TA = 25°C unless otherwise noted)

Current Transfer Ratio	CTR	1000	-	15000	%	IF=1mA, VCE=2V	
Collector-Emitter Saturation Voltage	VCE(sat)	-	-	1.2	V	IF=20mA, IC=100mA	
Isolation Resistance	RISO	10 ¹²	10 ¹⁴	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance	CIO	-	0.6	1	pF	V=0, f=1MHz	
Cut-off Frequency	fc	-	6	-	kHz	VCE=2V, IC=2mA RL=100Ω, -3dB	3
Response Time (Rise)	tr	-	91.5	300	μs	VCE=2V, IC=20mA RL=100Ω	4
Response Time (Fall)	tf	-	21.4	100	μs		4

Note 3. Fig.12&13

Note 4. Fig.14

Characteristic Curves

Fig.1 Collector Dark Current vs. Ambient Temperature

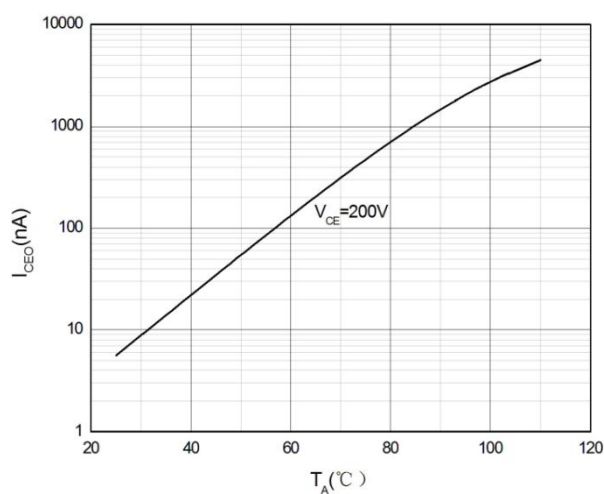


Fig.2 Forward Current vs. Forward Voltage

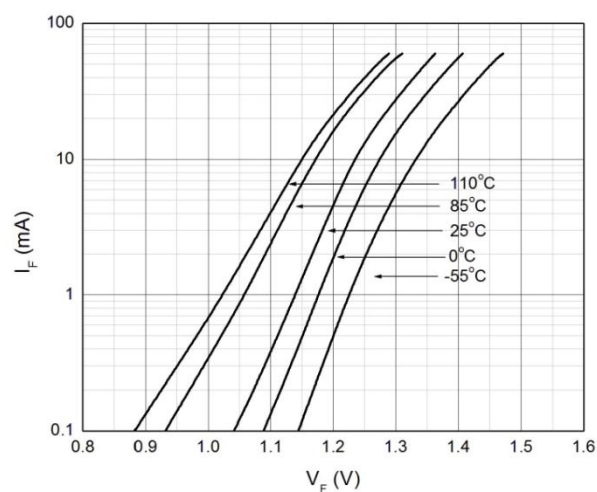


Fig.3 Collector Power Dissipation vs. Ambient Temperature

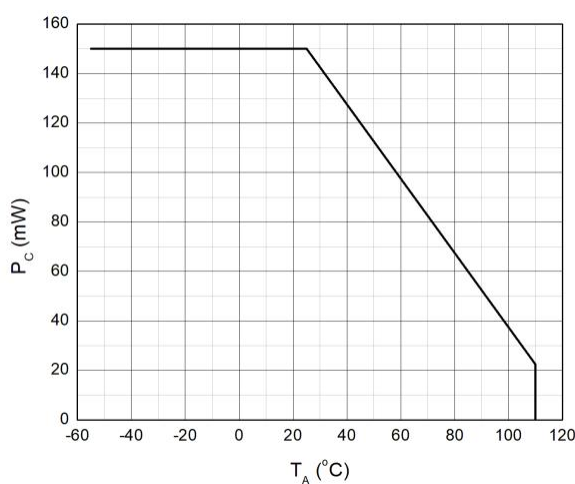
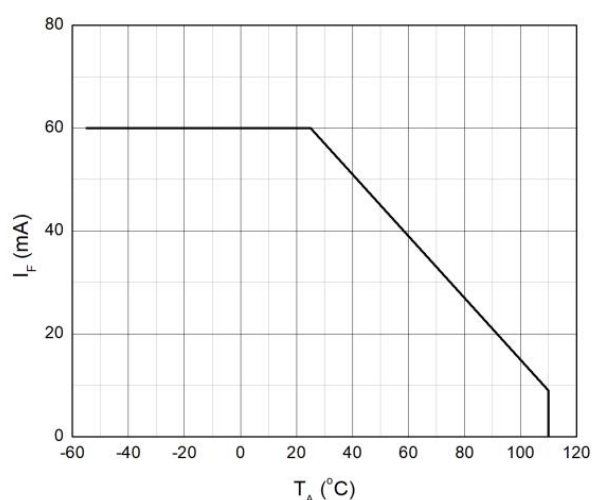
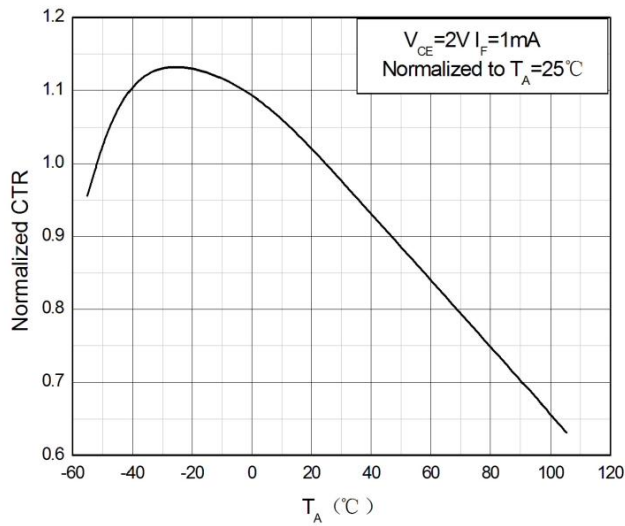


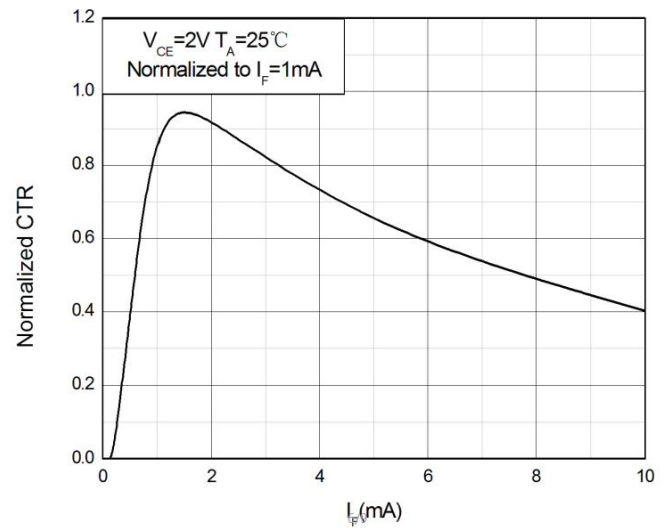
Fig.4 Forward Current vs. Ambient Temperature



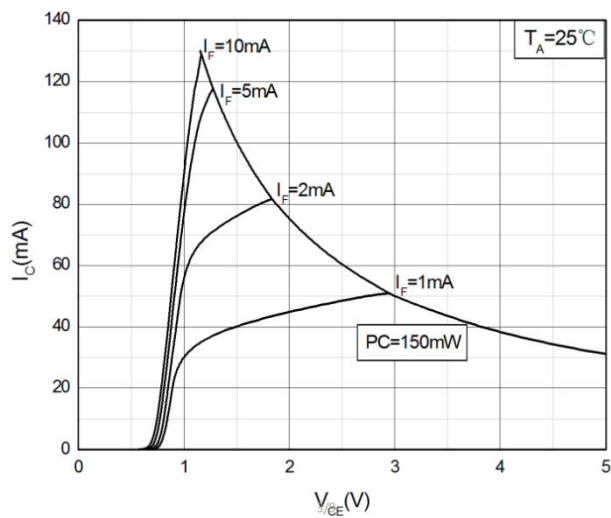
**Fig.5 Normalized Current Transfer Ratio
vs. Ambient Temperature**



**Fig.6 Normalized Current Transfer Ratio
vs. Forward Current**



**Fig.7 Collector Current
vs. Collector-emitter Voltage**



**Fig.8 Collector-emitter Saturation Voltage
vs. Forward Current**

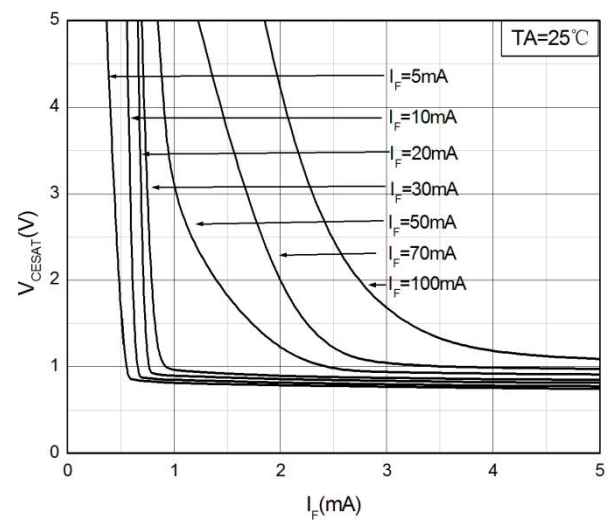


Fig.9 Collector-emitter Saturation Voltage vs. Ambient Temperature

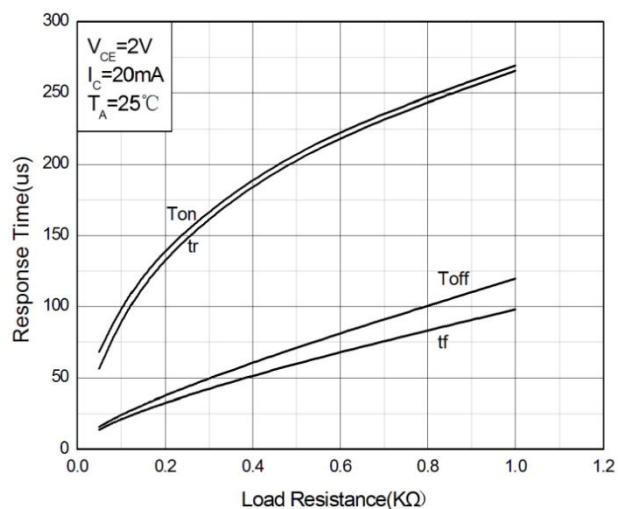


Fig.10 Switching Time vs. Load Resistance

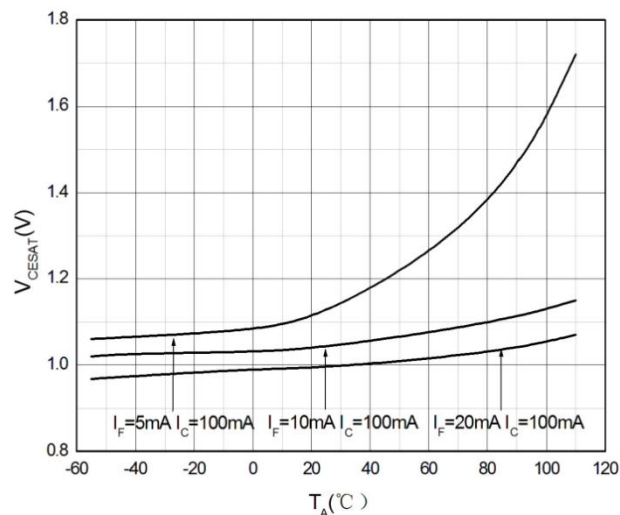
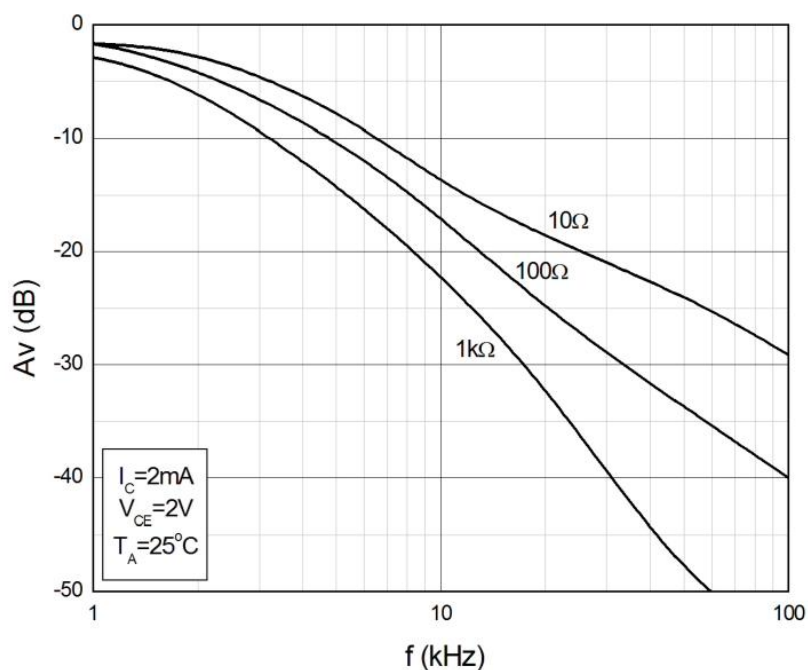
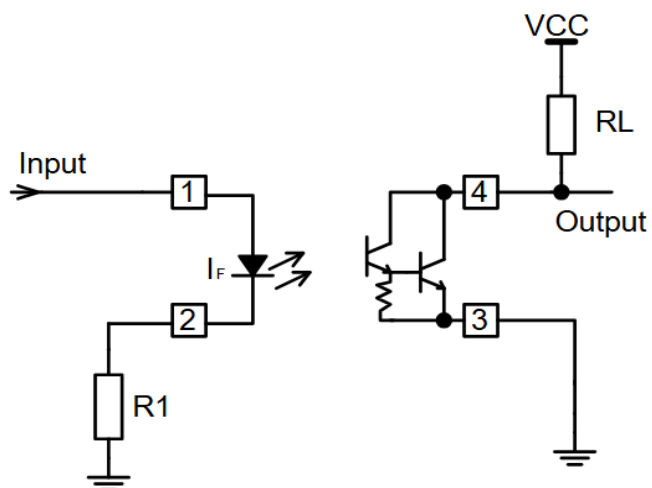
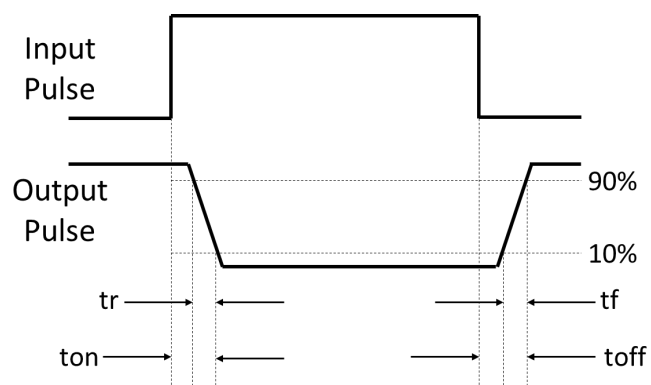
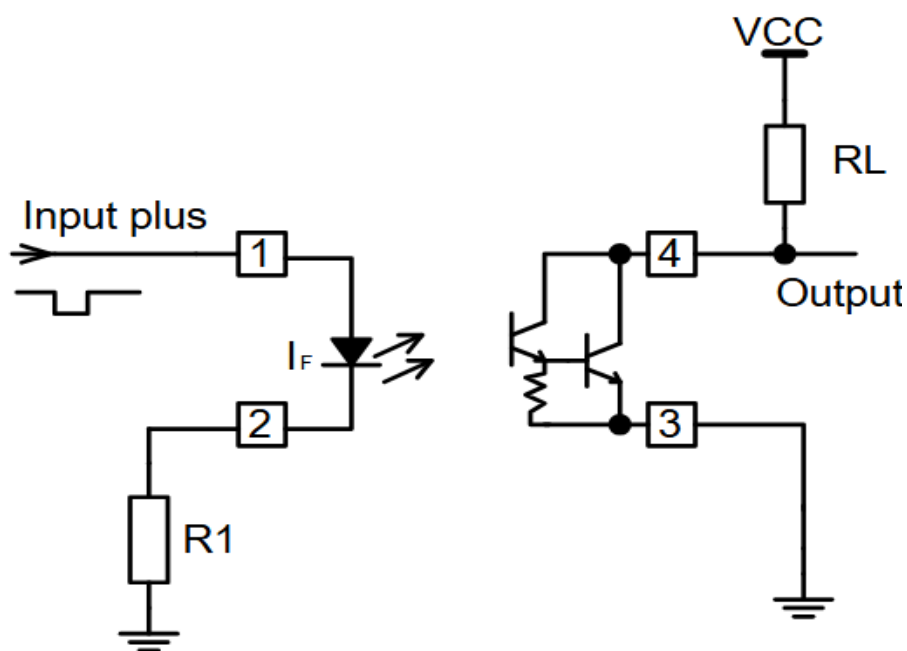


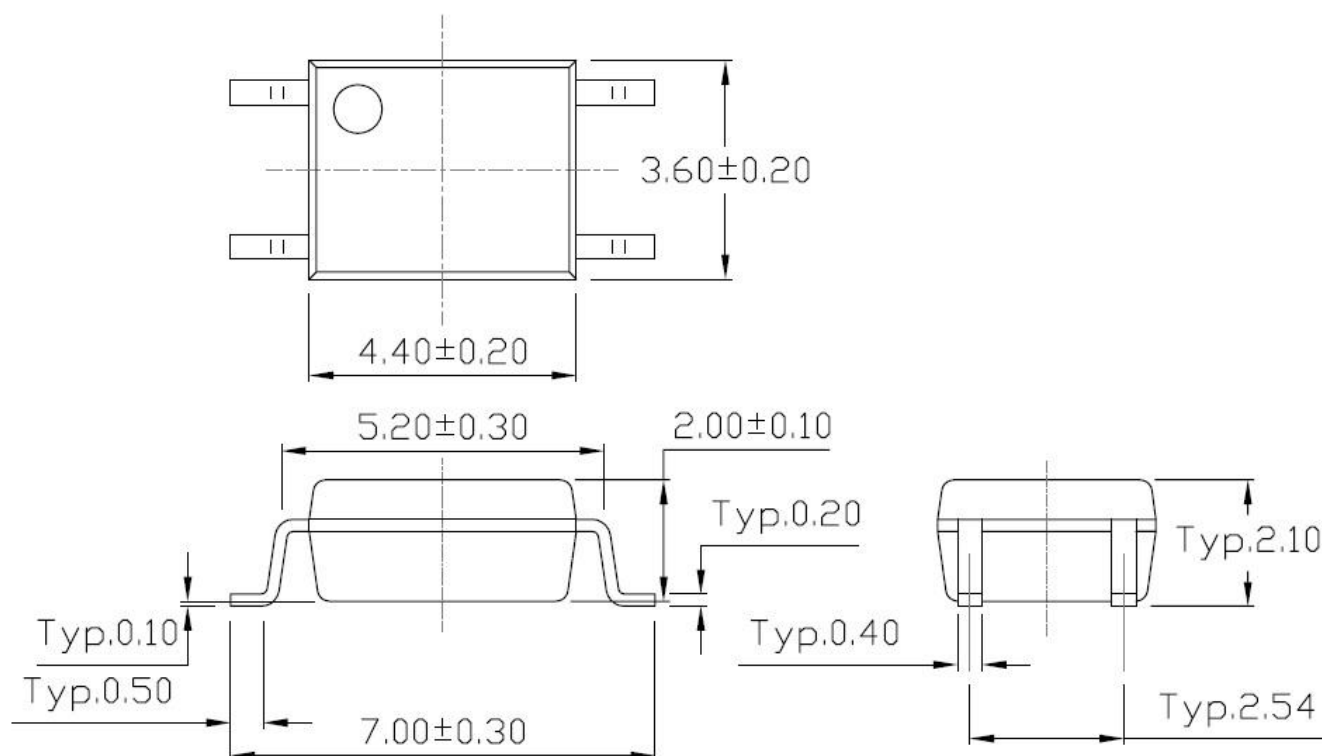
Fig.11 Frequency Response



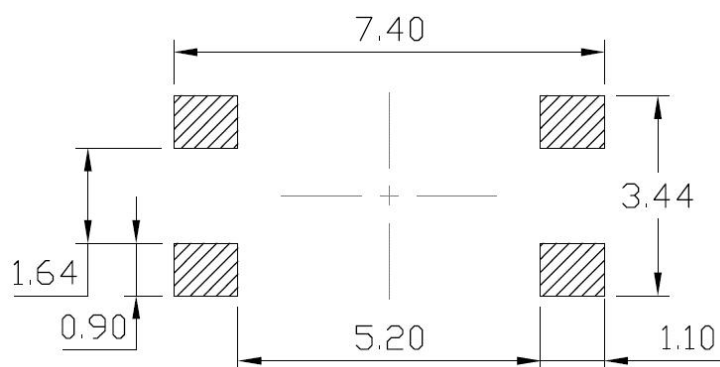
Test Circuits

Fig.12 Test Circuits of Response Time

Fig.13 Curves of Response Time

Fig.14 Test Circuits of Frequency Response


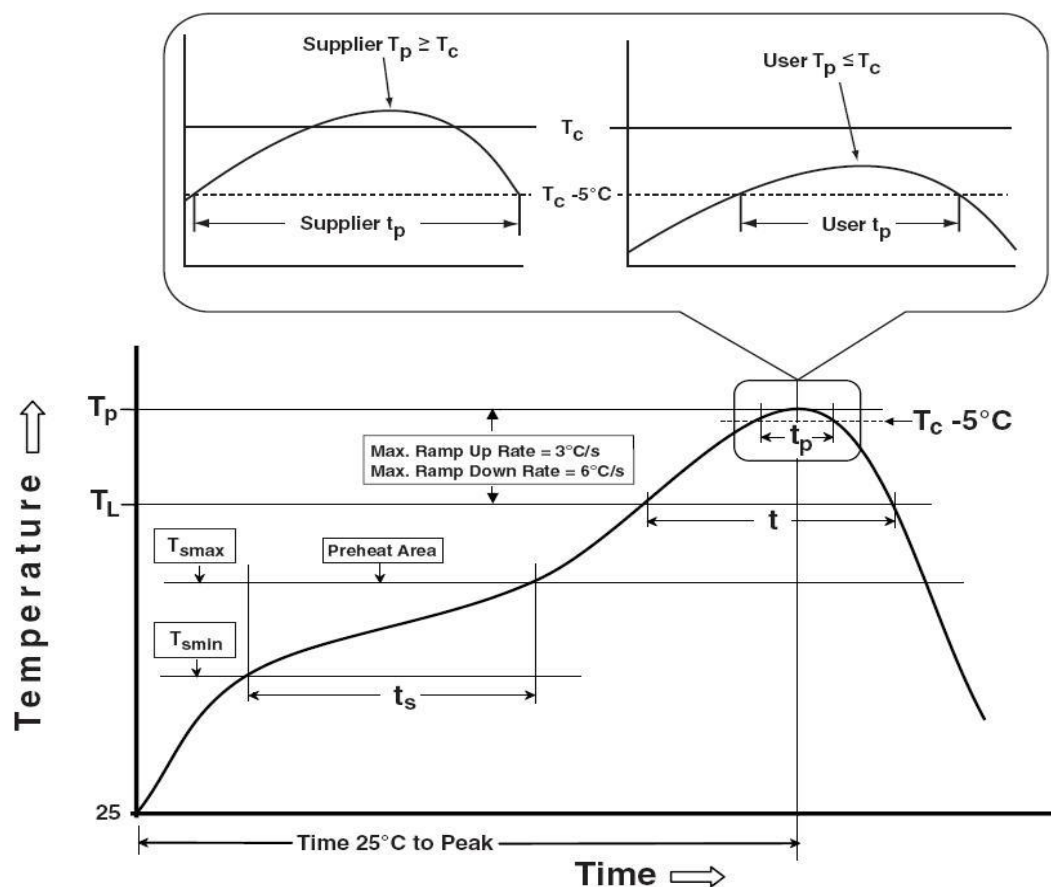
Package Dimensions (Dimensions in mm unless otherwise stated)



Recommended Solder Mask (Dimensions in mm unless otherwise stated)



REFLOW PROFILE



Reflow Information

Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	100	150°C
Temperature Max. (T _{smax})	150	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t _L to t _P)	3°C/second max.	3°C/second max.
Liquidous Temperature (T _L)	183°C	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (t _P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.