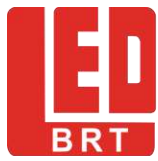




**THE DATASHEET OF
APC-817C1-SL**



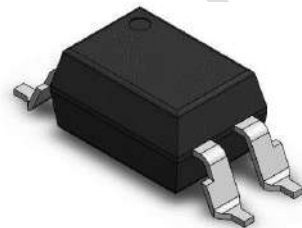


AMERICAN BRIGHT OPTOELECTRONICS CORP.

Specification for APC-817 Series

APC-817

DIP4, DC Input, Photo Transistor Coupler



The APC-817 series combines an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic DIP4 package with different lead forming options.

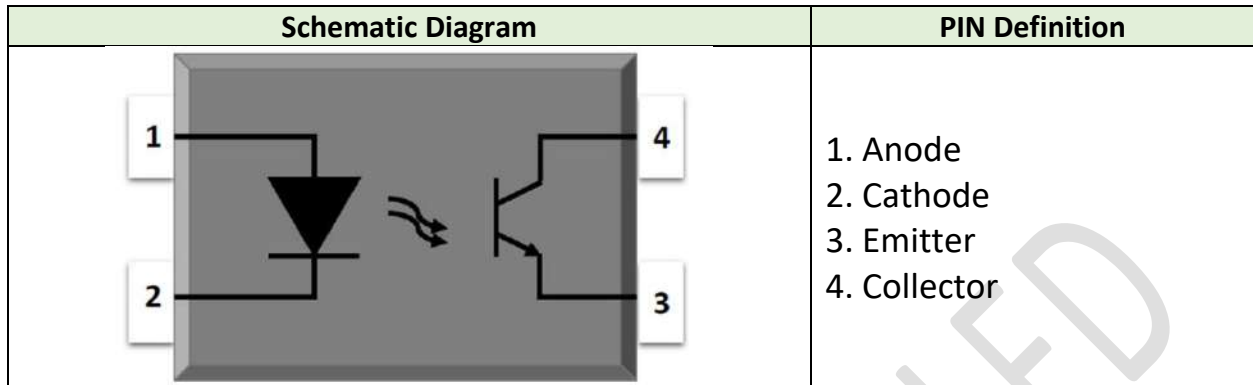
With the robust coplanar double mold structure, APC-817 series provide the most stable isolation feature.

Features:

- High isolation V_{rms} : 5000V
- CTR flexibility available
- DC input with transistor output
- Operating temperature: - 55 °C to 110 °C
- RoHS & REACH Compliance
- MSL Class 1
- Halogen free (Optional)
- UL - UL1577
- VDE - EN60747-5-5(VDE0884-5)
- CQC - GB4943.1, GB8898
- cUL- CSA Component Acceptance Service Notice No. 5A

Applications:

- Switch mode power supplies
- Programmable controllers
- Household appliances
- Office equipment



Absolute Maximum Ratings				
Parameter	Symbol	Value	Unit	Note
Input				
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	
Output				
Collector – Emitter Voltage	V_{CEO}	35	V	
Emitter – Collector Voltage	V_{ECO}	6	V	
Collector Current	I_C	50	mA	
Output Power Dissipation	P_O	150	mW	
Common				
Total Power Dissipation	P_{tot}	200	mW	
Isolation Voltage	V_{iso}	5000	V _{rms}	2
Operating Temperature	T_{opr}	-55~110	°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 at T _a =25°C								
Parameter	Symbol	min	Typ.	Max.	unit	Test Condition	Note	
Input								
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		
Output								
Collector Dark Current	I _{CEO}	-	-	100	nA	V _{EC} =20V, I _F =0		
Collector – Emitter Breakdown Voltage	BV _{CEO}	35	-	-	V	I _C =0.1mA, I _F =0		
Emitter – Collector Breakdown Voltage	BV _{ECO}	6	-	-	V	I _E =0.1mA, I _F =0		
Transfer Characteristics								
Current Transfer Ratio	APC-817A1	CTR	80	-	160	%	I _F =5mA, V _{CE} =5V	5
	APC-817B1		130	-	260			
	APC-817C1		200	-	400			
	APC-817D1		300	-	600			
Collector – Emitter Saturation Voltage	V _{CE(sat)}	-	0.06	0.2	V	I _F =20mA, I _C =1mA		
Isolation Resistance	R _{ISO}	10 ¹²	10 ¹⁴	-	Ω	DC500V, 40~60% R.H.		
Floating Capacitance	C _{IO}	-	0.4	1	pF	V=0, f=1MHz		
Response Time (rise)	Tr	-	3	18	μs	V _{CE} =2V, I _C =2mA RL=100Ω	3	
Response Time (fall)	Tf	-	4	18	μs		3	
Cut-off Frequency	f _c	-	80	-	kHz	V _{CE} =2V, I _C =2mA RL=100Ω, -3dB	4	

Note 3. Fig.12&13

Note 4. Fig.14

Note 5. CTR Value varies for each rank

Naming System:

APC-817A1-SL

A1: Indicated to the CTR value listed on Page 3 (A1/B1/C1/D1)

S: Indicated to the PIN type listed on Page 7 to Page 9 (None/M/S/SL/SML)

Characteristic Curves

Fig 1. Forward Current vs. Ambient Temperature

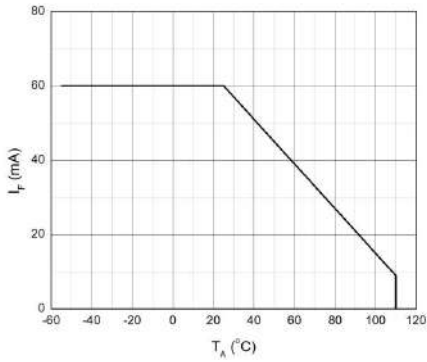


Fig 2. Collector Power Dissipation vs. Ambient Temperature

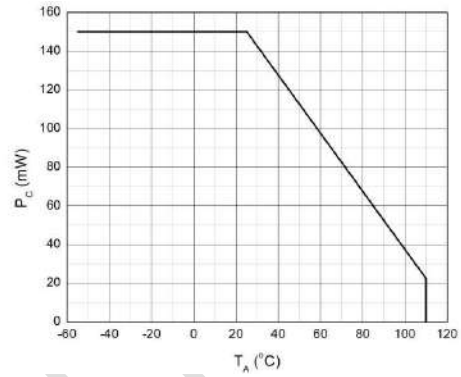


Fig 3. Forward Current vs. Forward Voltage

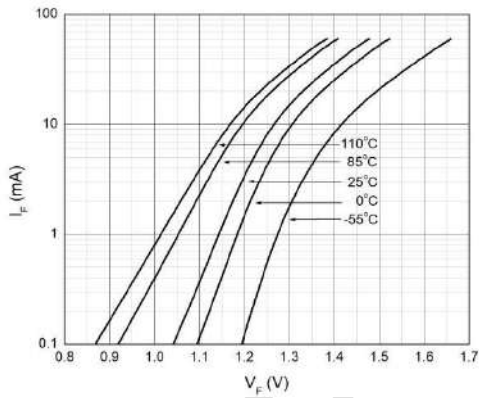


Fig 4. Collector Dark Current vs. Ambient Temperature

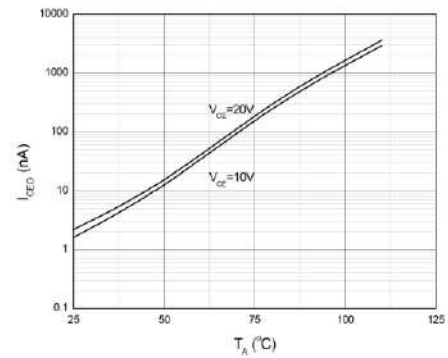


Fig 5. Collector Current vs. Collector-emitter Voltage

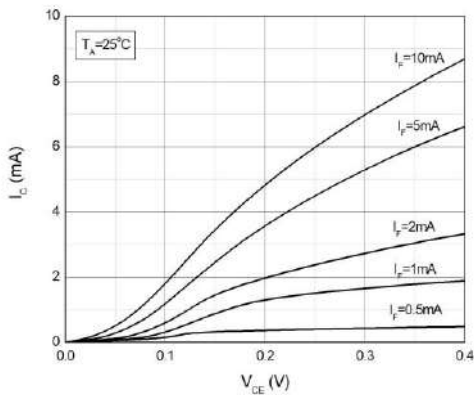


Fig 6. Collector Current vs. Collector-emitter Voltage

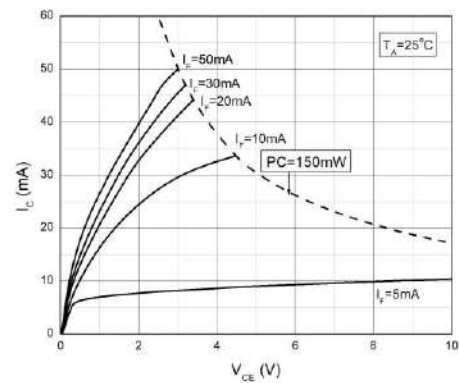


Fig 7. Normalized Current Transfer Ratio vs. Forward Current

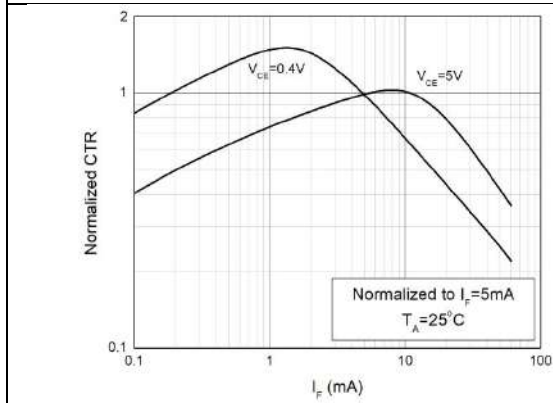


Fig 8. Normalized Current Transfer Ratio vs. Ambient Temperature

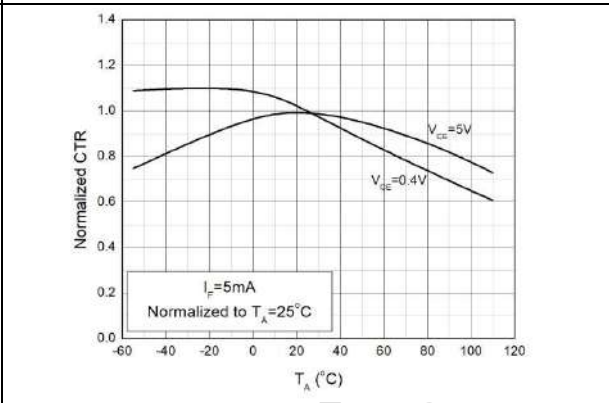


Fig 9. Collector-emitter Saturation Voltage vs. Ambient Temperature

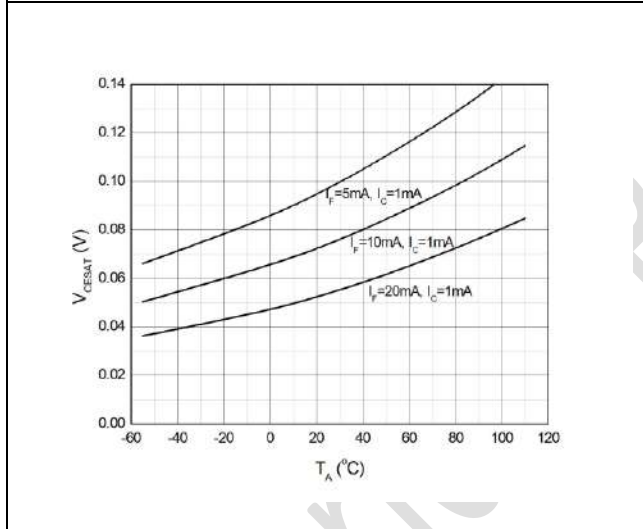


Fig 10. Switching Time vs. Load Resistance

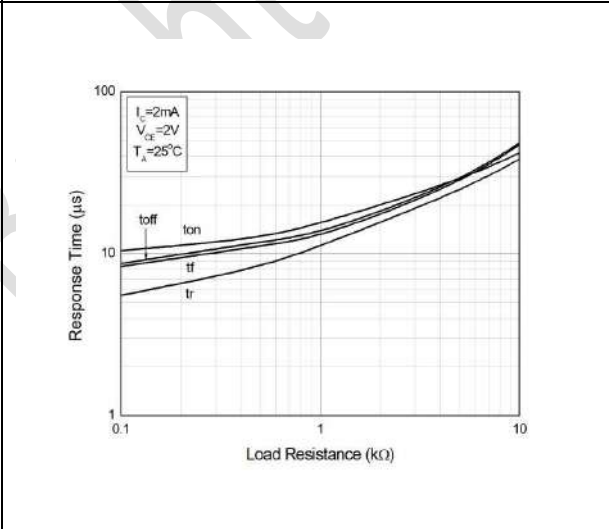


Fig 11. Frequency Response

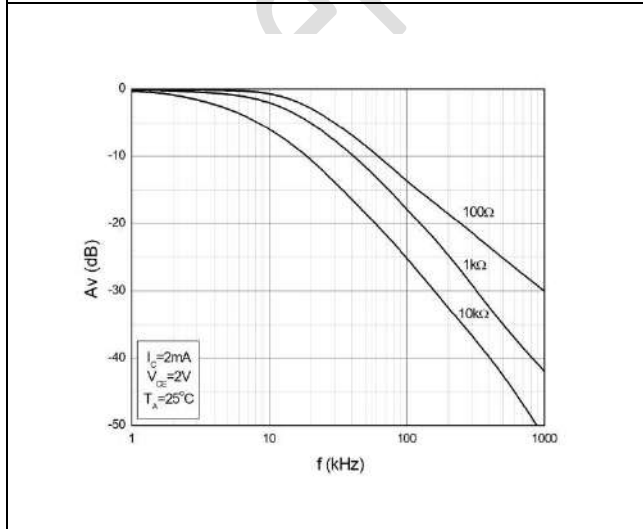
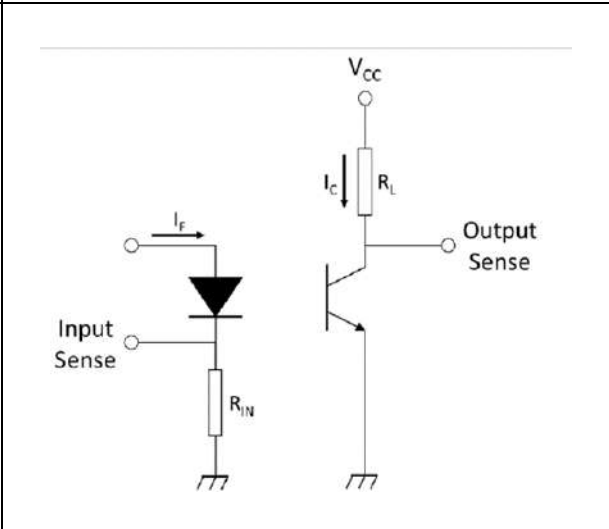


Fig 12. Test Circuits of Response Time





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Fig 13. Curves of Response Time

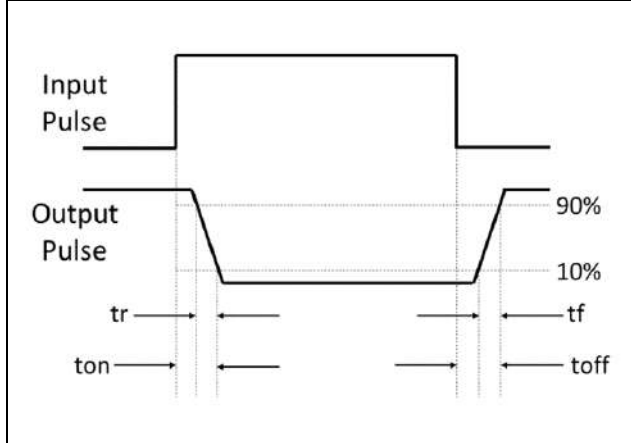
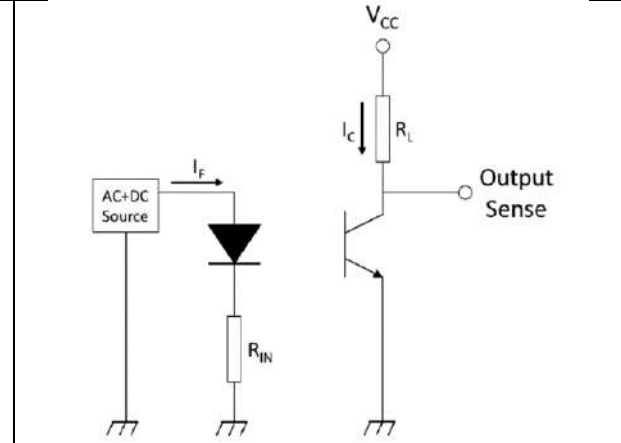


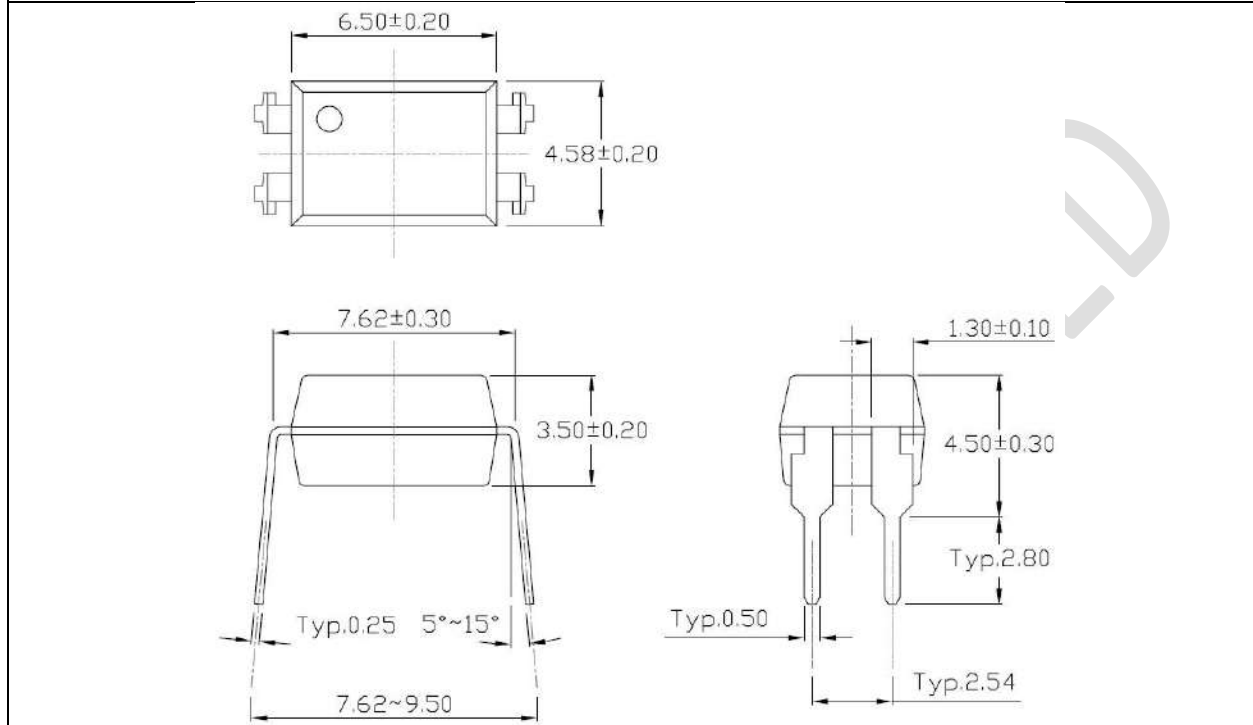
Fig 14. Test Circuits of Frequency Response



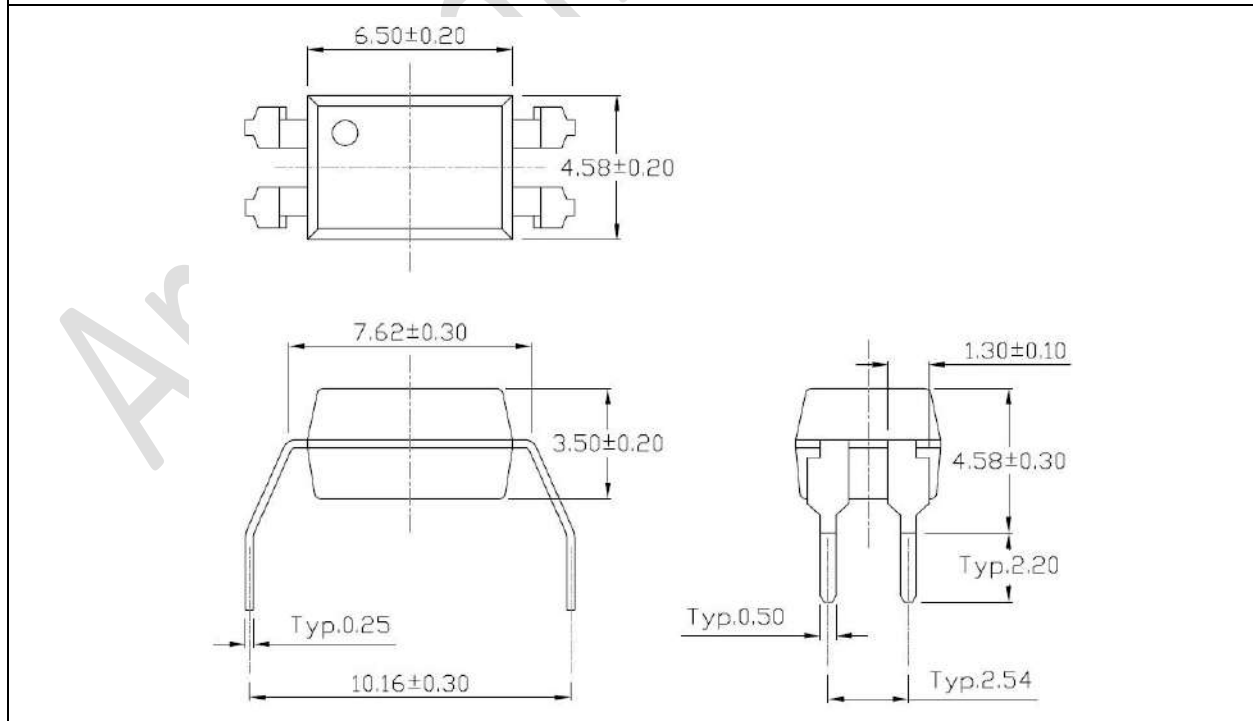
American Bright

Package Dimension (mm)

Standard DIP – Through hole (DIP Type) – APC-817xx



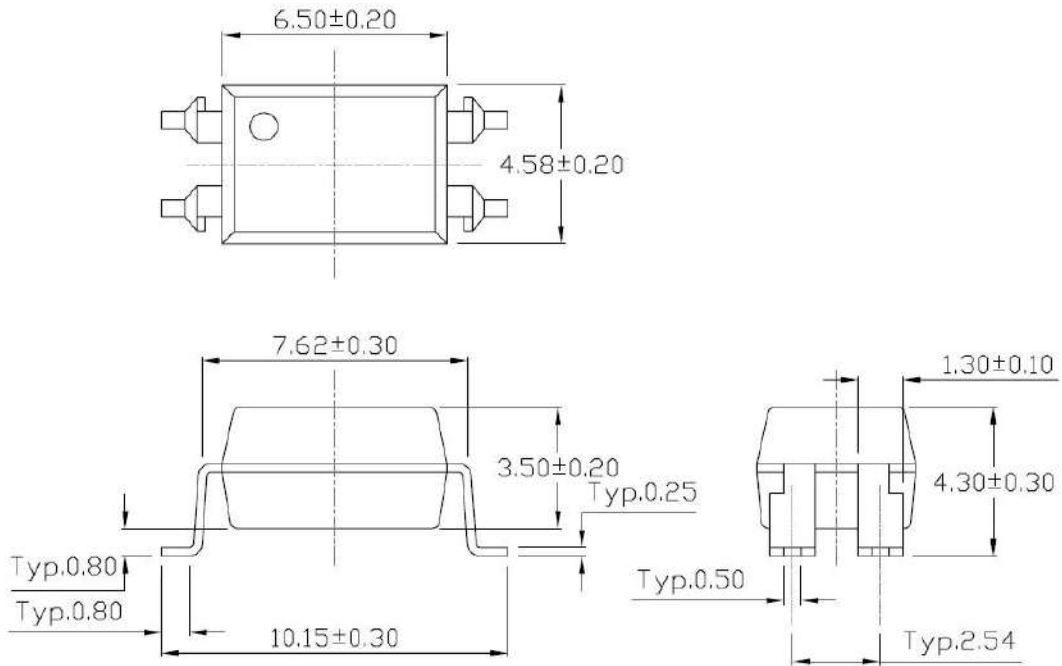
Gullwing (400mil) Lead Forming – Through Hole (M Type) – APC-817xx-M



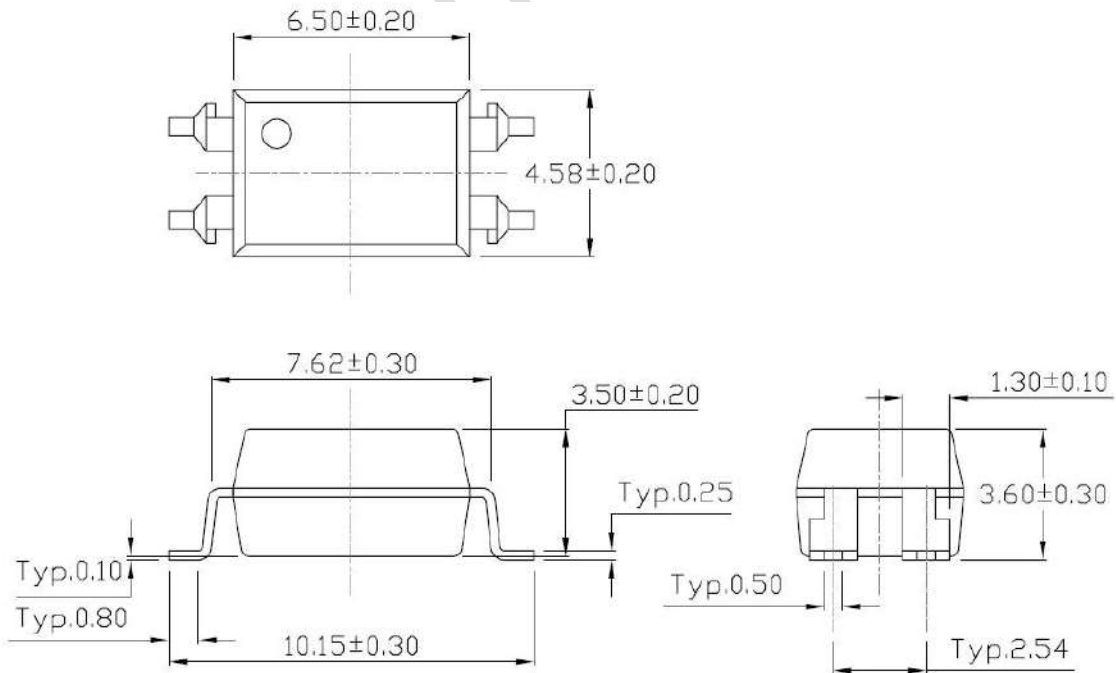


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Surface Mount Lead Forming (S Type) – APC817xx-S



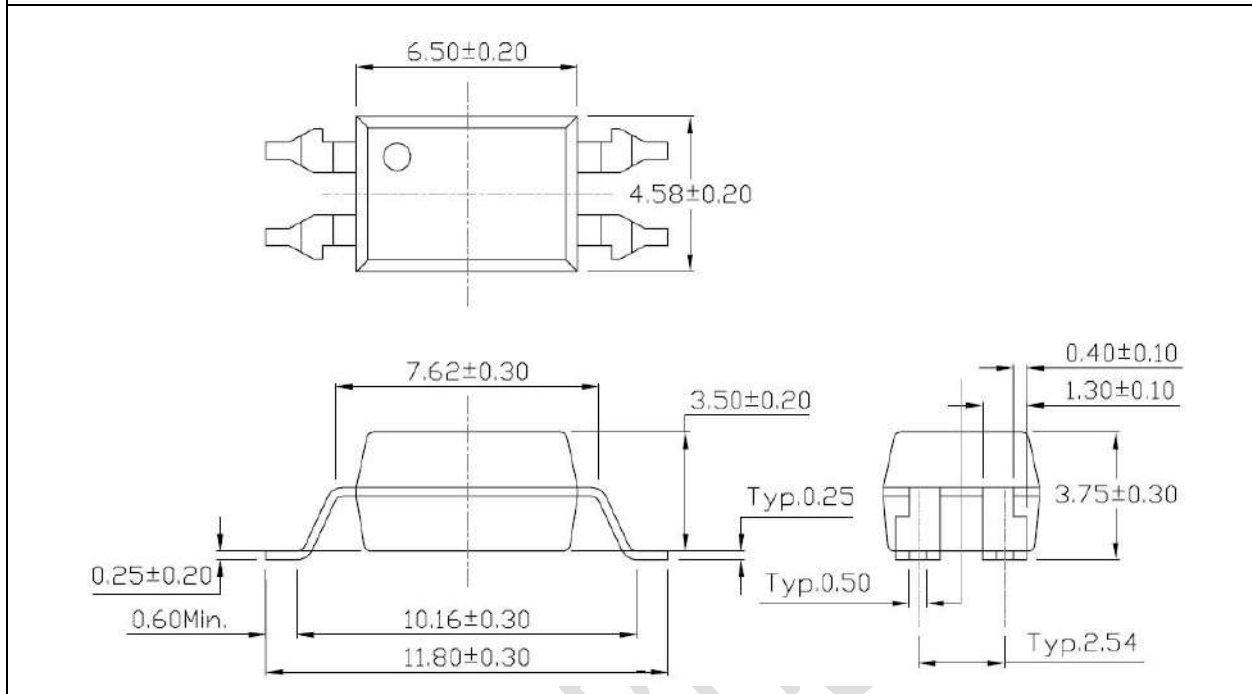
Surface Mount (Low Profile) Lead Forming (SL Type) - APC-817xx-SL





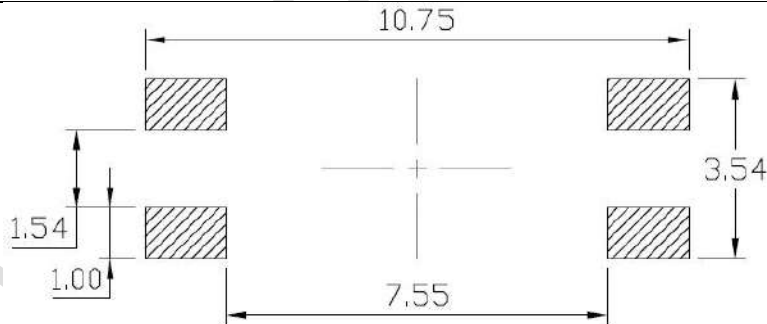
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Surface Mount (Gullwing) Lead Forming (SLM Type) - APC-817xx-SLM

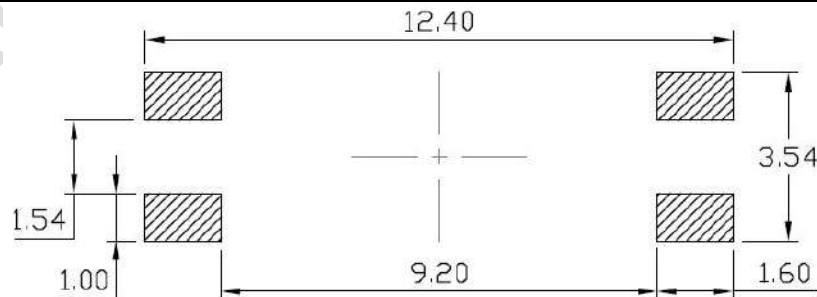


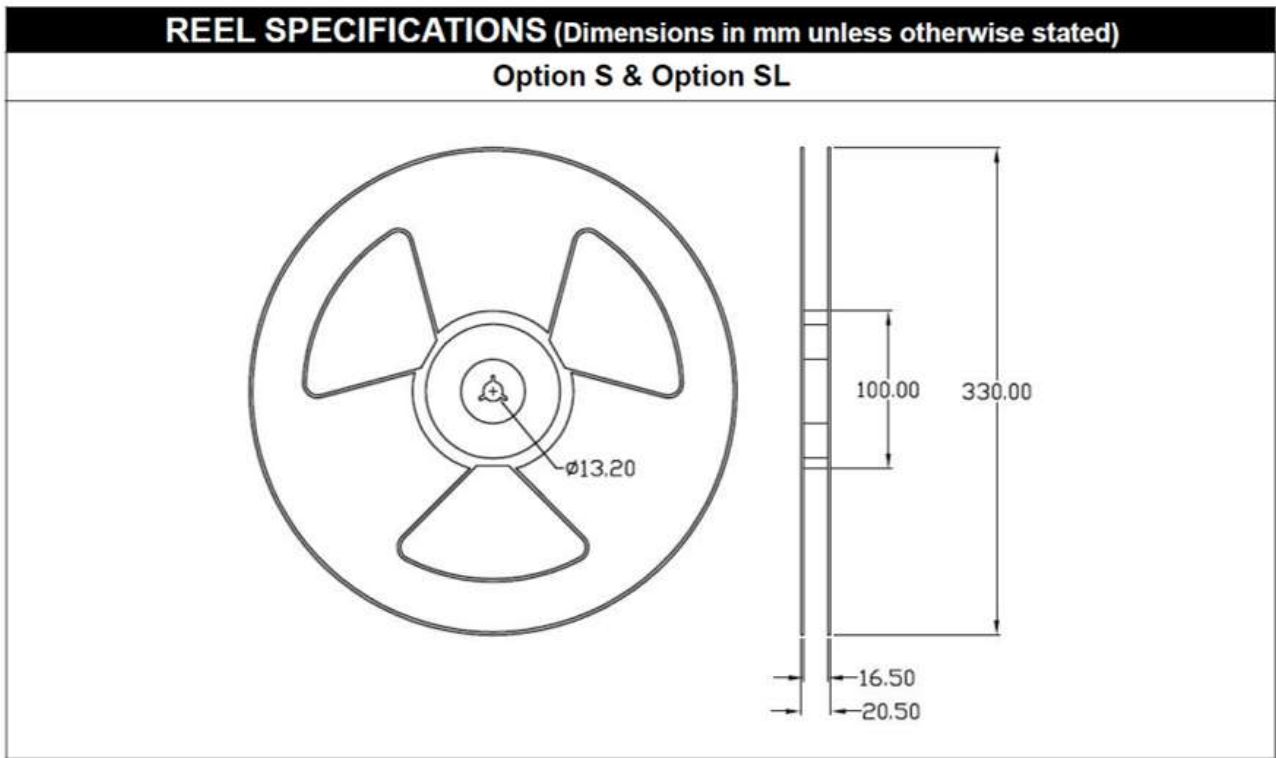
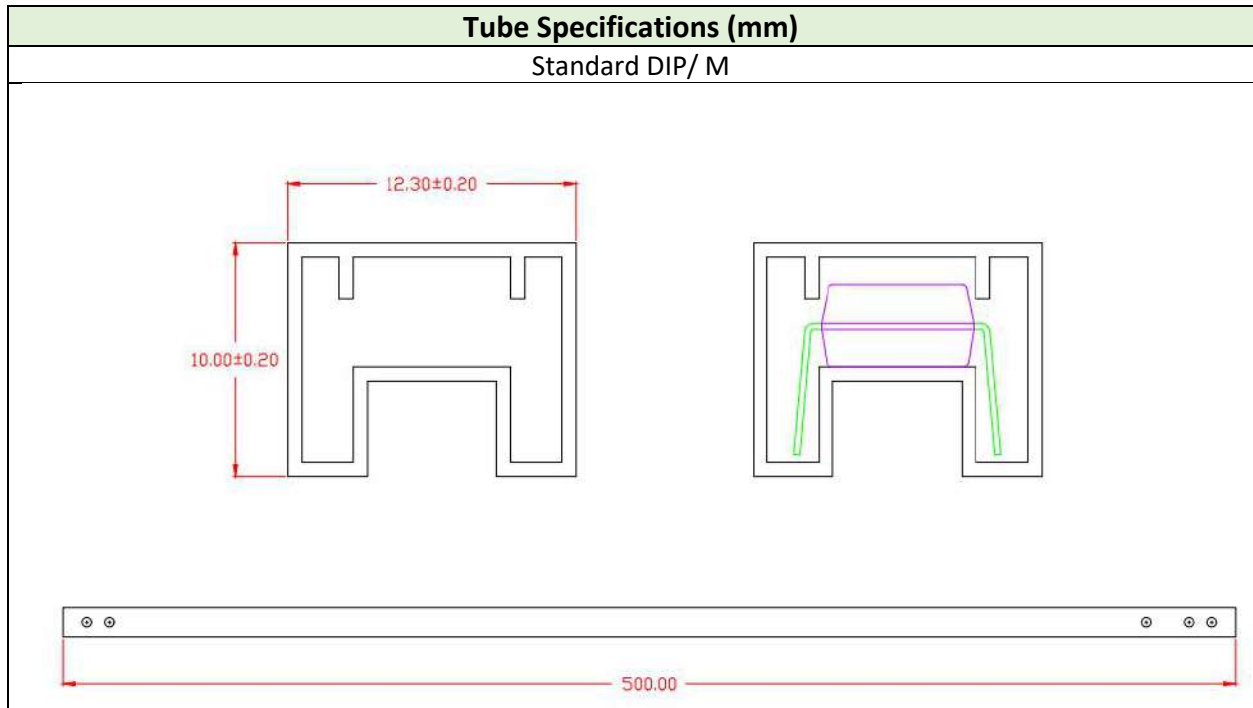
Recommended Solder Mask (mm)

Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming



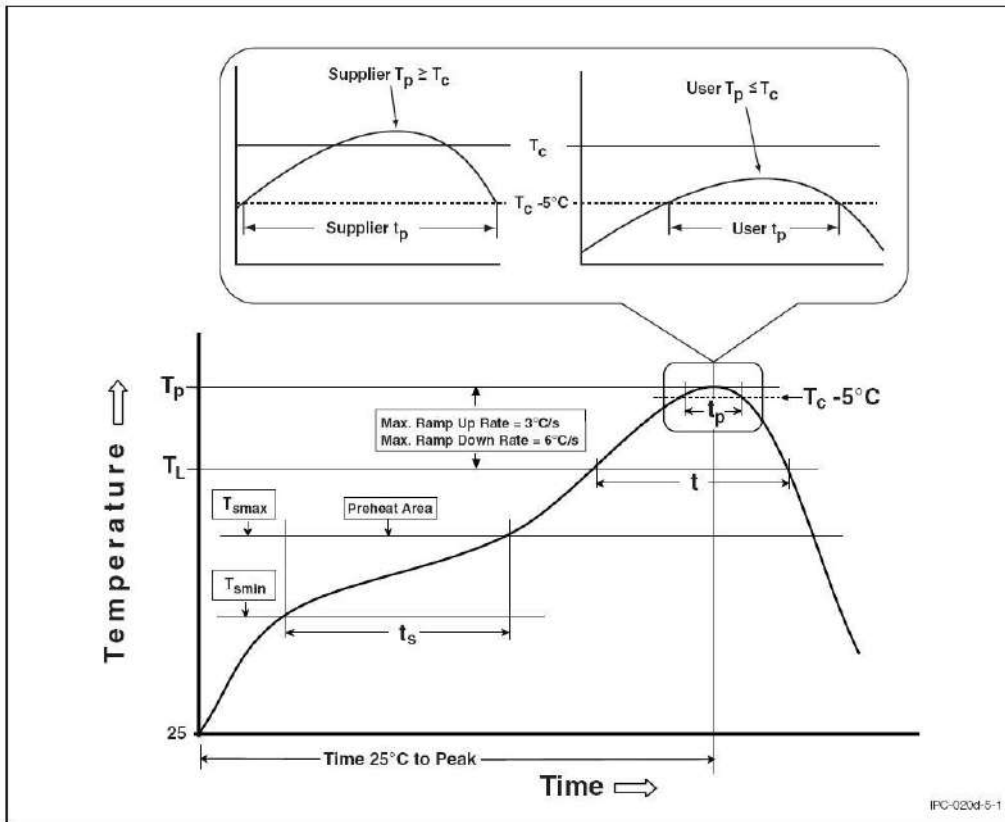
Surface Mount (Gullwing) Lead Forming





Reflow Information

Reflow Profile



Profile Feature	Sn-Pb Assembly Profile	Pb-free Assembly Profile
Temperature min. ($T_{s, min}$)	100°C	150°C
Temperature Max. ($T_{s, Max}$)	150°C	200°C
Time (t_s) from ($T_{s, min}$ to $T_{s, max}$)	60-120 s	60-120 s
Ramp-up Rate (t_L to t_P)	3°C/s max.	3°C/s max.
Liquidous Temperature (T_L)	183°C	217°C
Time (t_L) Maintained Above (T_L)	60-150 s	60-150 s
Peak Body Package Temperature	230°C +0°C/ -5°C	260°C +0°C/ -5°C
Time (t_P) within 5°C of 260°C	20 s	30 s
Ramp-down Rate (T_P to T_L)	6°C/s max.	6°C/s max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

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