EL817 Series
Technical Data Sheet
Photocoupler-RoHS Compliant

Features:

EL817

EL817M

EL817S

- Current transfer ratio
  (CTR:MIN.50% at IF =5mA ,VCE =5V)
- High isolation voltage between input
  and output (Viso=5000 V rms)
- Compact dual-in-line package
  EL817*:1-channel type
- Pb free
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved (No. 300858,300859,304855, 304827,2022251,0143133/01-03,0101083/01, 303345,303349)
- NEMKO approved (No. P04203585, P00102385, P02101854)
- DEMKO approved (No. 311822-01/02/03,310352-01, 311822-03A)
- CSA approved (No. 1143601)
- BSI approved (No. 8592, 8593)
- Options available:
  - Leads with 0.4”(10.16mm) spacing (M Type)
  - Leads bends for surface mounting (S and S1 Type)
  - Tape and Reel of Type Ⅰ for SMD(Add”-TA” Suffix)
  - Tape and Reel of Type Ⅱ for SMD(Add”-TB” Suffix)
  - The tape is 16mm and is wound on a 33cm reel
- The product itself will remain within RoHS compliant version.

Description

The EL817 series contains a infrared emitting diode optically coupled to a phototransistor. It is packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.

Applications

- Computer terminals
- System appliances, measuring instruments
- Registers, copiers, automatic vending machines
- Electric home appliances, such as fan heaters, etc.
- Signal transmission between circuits of different potentials and impedances

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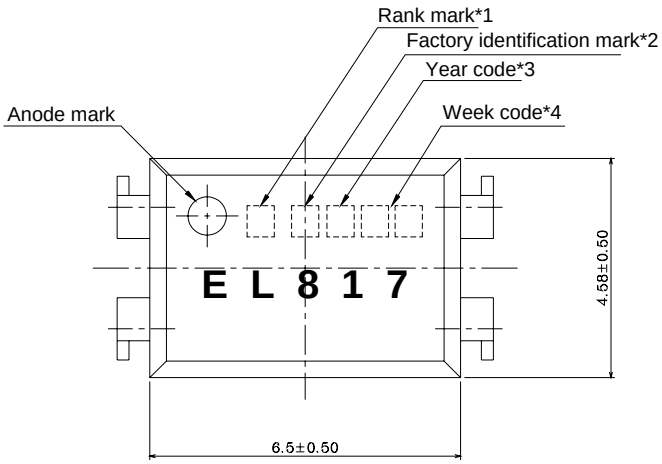
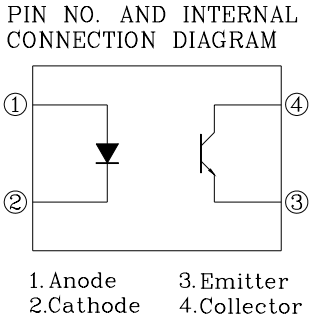
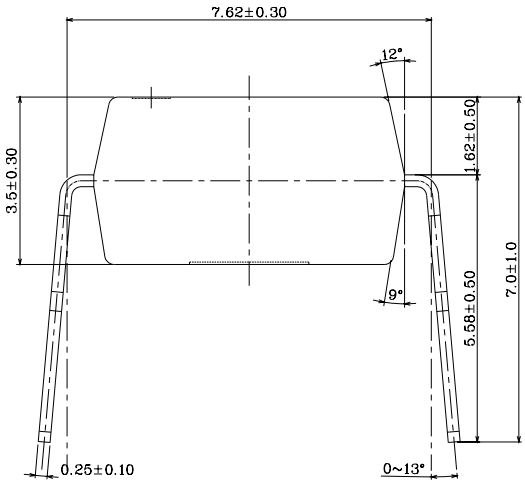
Device Selection Guide

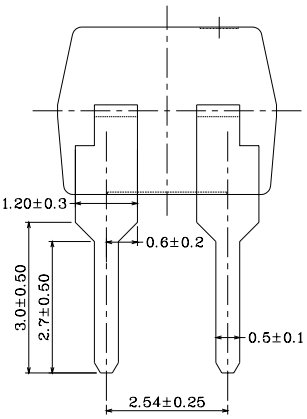
Part. No.	Chip Material	
	IR	PT
EL817*	GaAs	Silicon

Package Dimensions









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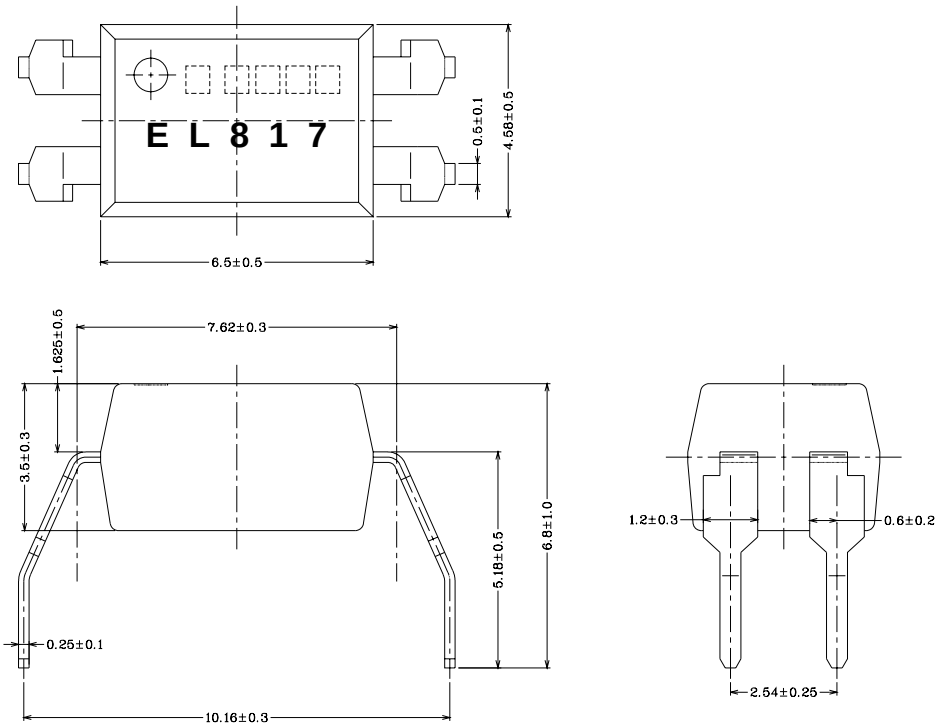
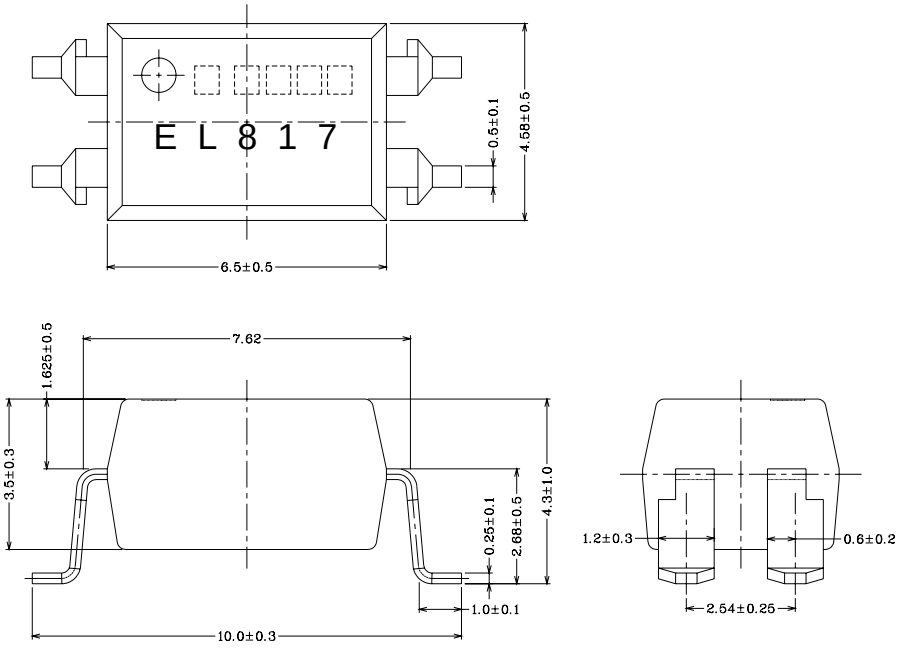
Package Dimensions

M Type



S Type



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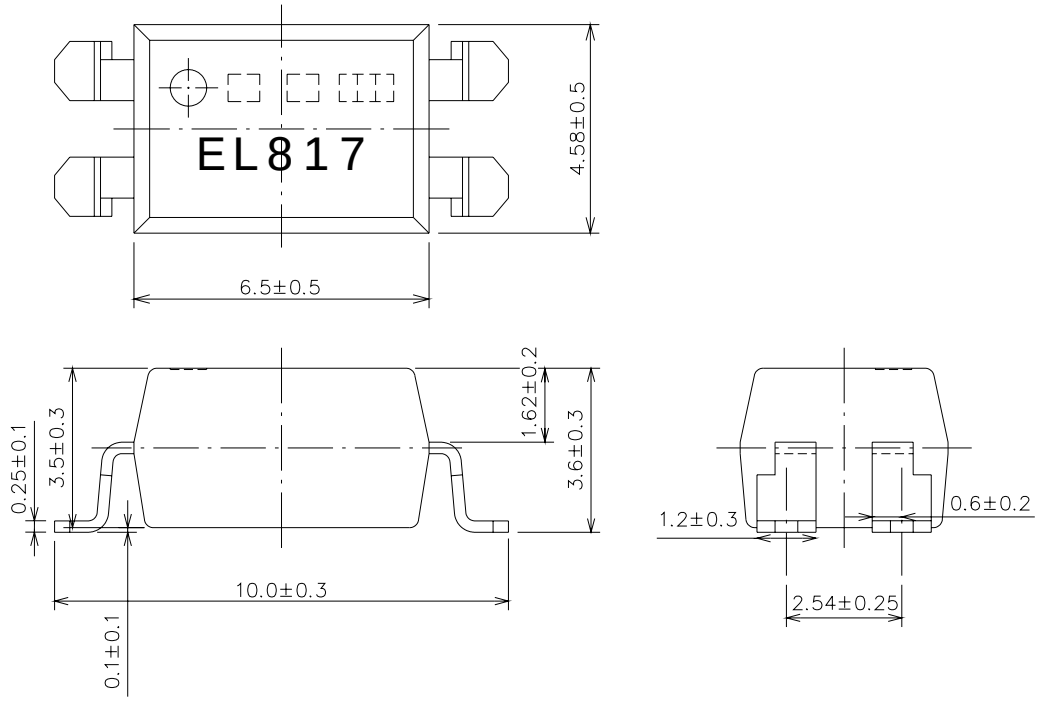
S1 Type



Notes:

1. Rank shall be or shall not be marked
2. Factory code shall be marked (T: Taiwan / C: China)
3. Year date code
4. 2-digit work week
5. All dimensions are in millimeters
6. Specifications are subject to change without notice

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Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	70	mW
Output	Collector Power Dissipation	P_C	150	mW
	Collector Current	I_C	50	mA
	Collector-Emitter Voltage	V_{CEO}	35	V
	Emitter-Collector Voltage	V_{ECO}	6	V
Total Power Dissipation		Ptot	200	mW
*1 Isolation Voltage		Viso	5000	V rms
Operating Temperature		Topr	-55~+110	°C
Storage Temperature		Tstg	-55~+125	°C
*2 Soldering Temperature		Tsol	260	°C

*1 AC for 1 minute, R.H= 40~ 60%RH

-Isolation voltage shall be measured using the following method.

(1) Short between anode and cathode on the primary side and between collector, emitter and base on the secondary side.

(2) The isolation voltage tester with zero-cross circuit shall be used.

(3) The waveform of applied voltage shall be a sine wave

*2 For 10 seconds

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Electro-Optical Characteristics

(Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Input	Forward	V_F	-	1.2	1.4	V	I_F=20mA
	Reverse Current	I_R	-	-	10	uA	V_R=4V
	Terminal	Ct	-	30	250	pF	V=0,f=1kHz
Output	Collector Dark current	I_{CEO}	-	-	100	nA	V_{CE}=20V
	Collector-Emitter breakdown voltage	BV_{CEO}	35	-	-	V	Ic=0.1mA
Transfer Characteristics	Current Transfer ratio	CTR	50	-	600	%	I_F=5mA ,V_{CE}=5V
	Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.1	0.2	V	I_F=20mA ,Ic=1 mA
	Isolation resistance	R_{ISO}	5×10^{10}	10^{11}	-	Ω	DC500V,40~60%R.H
	Flotation capacitance	Cf	-	0.6	1.0	pF	V=0, f=1MHz
	Cut-off frequency	fc	-	80	-	kHz	V_{CE}=5V, I_C=2 mA R_L=100Ω, -3dB
	Rise time	t_r	-	4	18	us	V_{CE}=2V I_C=2mA,R_L=100Ω
	Fall time	t_f	-	3	18	us	

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Supplement

Current Transfer Ratio CTR

Sub-Model No.	Rank mark	CTR (%)	*Condition*
EL817* note 1		50 to 600	I_F = 5 mA V_{CE} = 5 V T_a = 25°C
EL817* (L) note2	L	50 to 100	
EL817* (A)	A	80 to 160	
EL817* (B)	B	130 to 260	
EL817* (C)	C	200 to 400	
EL817* (D)	D	300 to 600	
EL817* (AB)	A or B	80 to 260	
EL817* (BC)	B or C	130 to 400	
EL817* (CD)	C or D	200 to 600	

Note1. The symbol " * " can be none or S or M by different leads form request

Note2. The symbol " ( ) " can be CTR rank

Fig. 1 Forward Current vs. Ambient Temperature

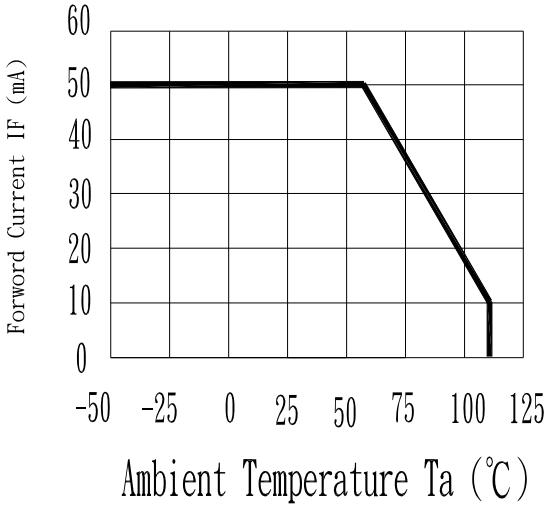

Fig. 2 Collecter Power Dissipation vs. Ambient Temperature

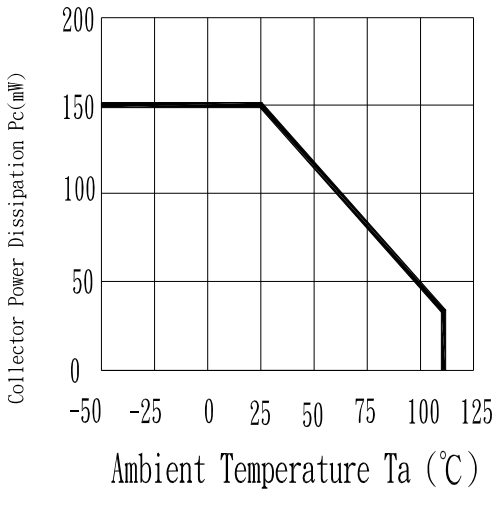

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Fig. 3 Collector−emitter Saturation Voltage vs. Forward Current (Ta=25°C)

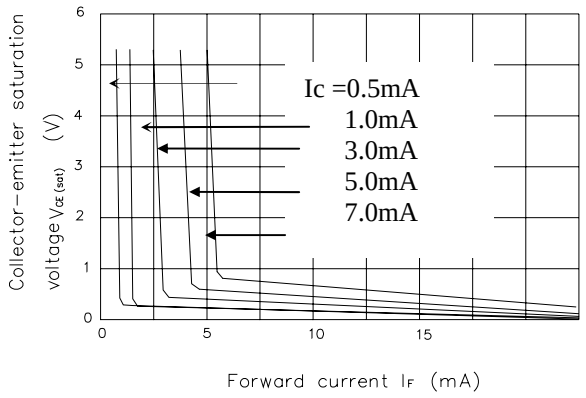

Fig.4 Current transfer Ratio vs. Forward Current

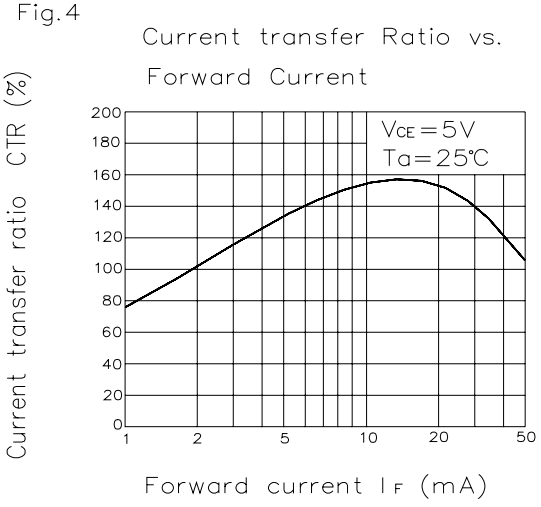

Fig.5 Forward Current vs. Forward Voltage Voltage

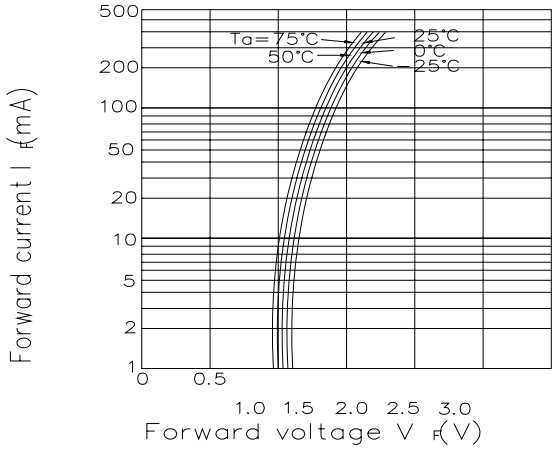

Fig.6 Collector Current vs. Collector−emitter Voltage (Ta=25°C)

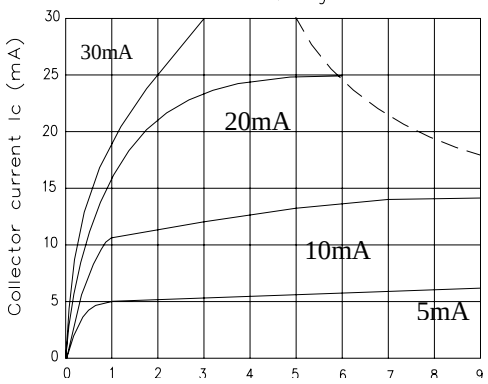

Fig.7 Relative Current Transfeer Ratio vs. Ambient Temperature

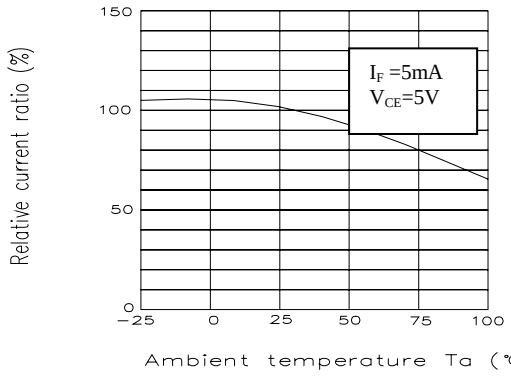

Fig.8 Collector−emitter Saturation Voltage vs. Ambient Temperature

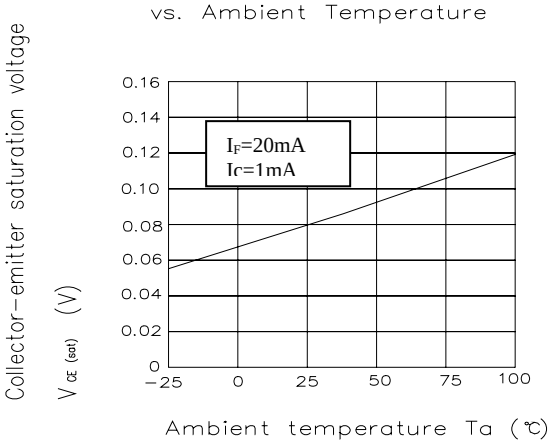

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Fig.9

Collector Dark Current vs. Ambient Temperature

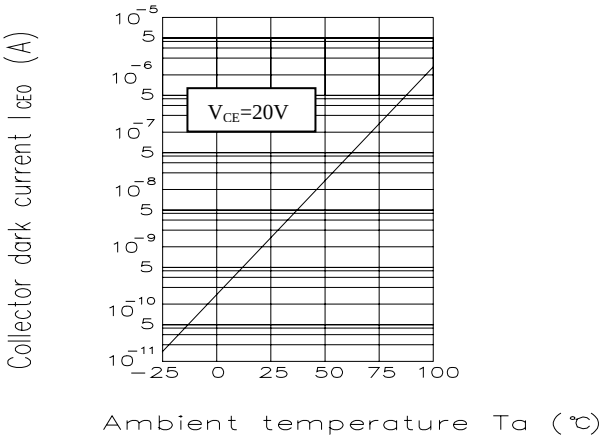


Fig.10

Response Time vs. Load Resistance

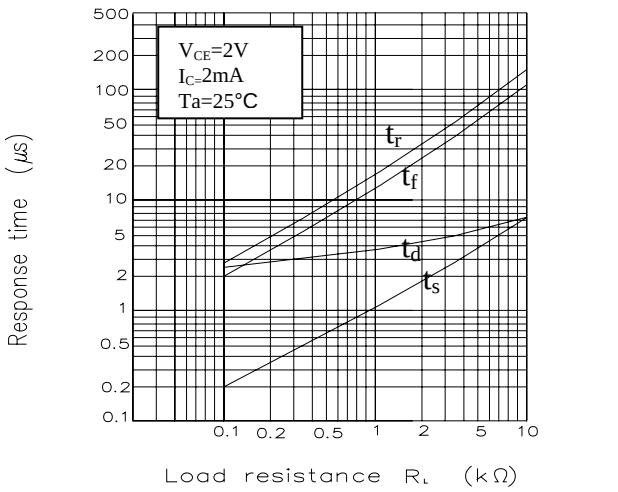
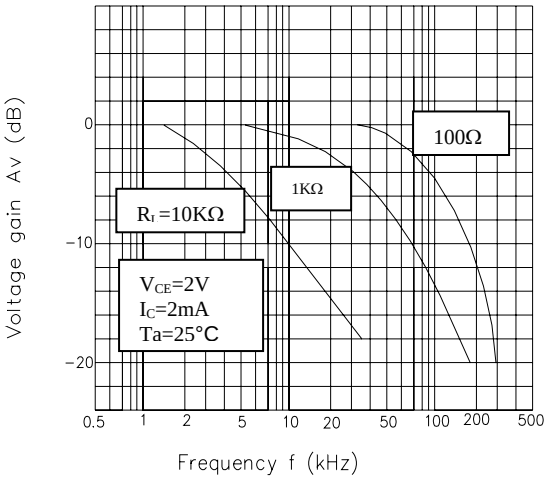
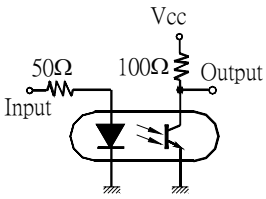
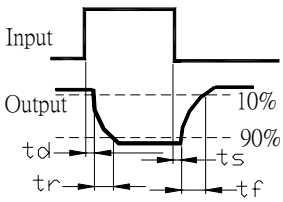


Fig.11

Frequency Response







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RELIABILITY PLAN

- **The reliability of products shall be satisfied with items listed below.**

  Confidence level : 90 % , LTPD : 10 %

Classification	Test Item	Description & Condition	(Acc.) Sample	Failure Criteria	Reference Standard
Endurance test	**Operation Life ***	**Ta = 25 ± 3°C** **IR: If = 50 mA** **Pt: Pc = 130 mW (Vf=1.4v) , 1000 hrs**	**0 / 22**		**MIL-S-750 : 1026** **MIL-S-883 : 1005** **JIS C 7021 : B-1**
	High Temperature / High Humidity Reverse Bias (H3TRB)	**Ta = 85 ± 3°C , Humi. = 85 % rh** **Pt: 80% * Vce (max rating) , 1000 hrs**	**0 / 22**	**CTR shift > 1.2** **Vf > U* 1.0** **Ir > U * 1.0** **Vce(sat) >U*1.0** **Bvceo < L*1.0** **Bveco < L*1.0**	**JIS C 7021 : B-11**
	High Temperature Reverse Bias (HTRB)	**Ta = 105 ± 3°C** **Pt: 100% * Vce (Max rating) ,** **1000 hrs**	**0 / 22**		**JIS C 7021 : B-8**
	Low Temperature Storage	**Ta = -50 ± 3°C , 1000 hrs**	**0 / 22**		**JIS C 7021 : B-12**
	High Temperature Storage	**Ta = 125 ± 3°C , 1000 hrs**	**0 / 22**	**L :Low Spec.Limit**	**JIS C 7021 : B-10** **MIL-S-883 : 1008**
	Auto clave	**P = 15 PSIG , Ta = 121 °C ,** **Humi. = 100 % rh , 48 hrs**	**0 / 22**	**U : Up Spec. Limit**	**JESD 22-A102-B**
Environmental Test	**Temperature Cycling (Air to Air)**	**125°C ~ - 55 °C** **30 ~ 30 min , 100 cycles**	**0 / 22**		**MIL-S-883 :1010** **JIS C 7021 : A-4**
	Thermal Shock (Liquid to Liquid)	**125 ~ - 55°C** **t (dwell) = 5 min** **t (trans.) = 10 sec , 100 cycles**	**0 / 22**		**MIL-S-202 : 107D** **MIL-S-750 : 1051** **MIL-S-883 :1011**
	Solder Resistance	**Ta = 260 ± 3°C** **t (dwell) = 10 ± 1 sec**	**0 / 22**		**MIL-S-750 : 2031** **JIS C 7021 : A-1**
	Solder Ability	**Ta = 230 ± 3 °C** **t (dwell) = 5 ± 1 sec**	**0 / 22**		**MIL-S-883 : 2003** **JIS C 7021 : A-2**

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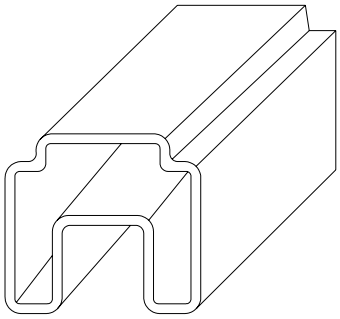
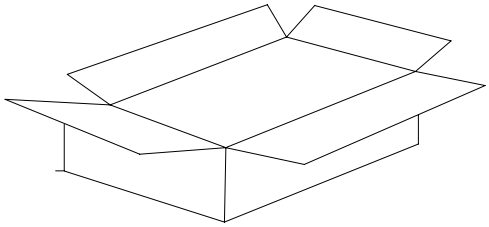
1. Tube Packing Specifications (For Dip & M Type)

1. Tube



2. Inner Carton



- Packing Quantity
  1. 100 Pcs/ Per Tube
  2. 25 Tubes / Inner Carton
  3. 12 Inner Cartons / Outside Carton

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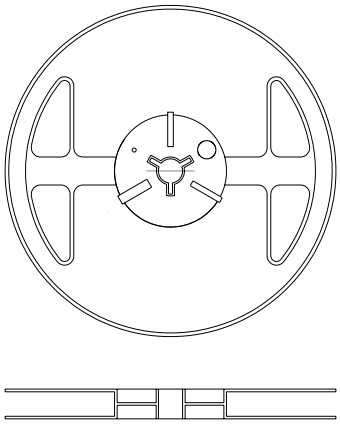
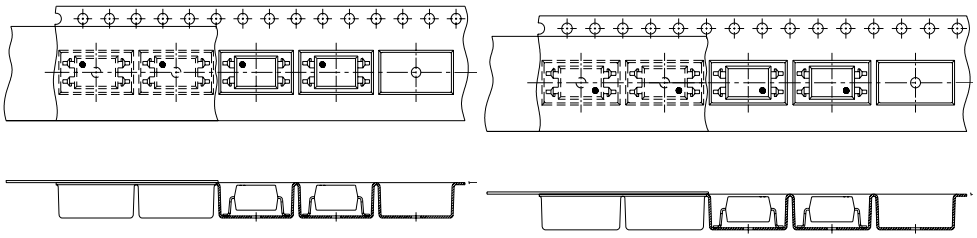
1. Tape & Reel Packing Specifications

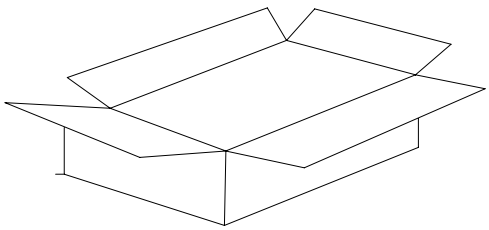
1. Tape & Reel (For S & S1 Type only)





TA **TB**

2. Inner Carton



- Packing Quantity
  1. 1,000 Pcs / Per Reel
  2. 3 Reels / Inner Carton
  3. 10 Inner Cartons / Outside Carton