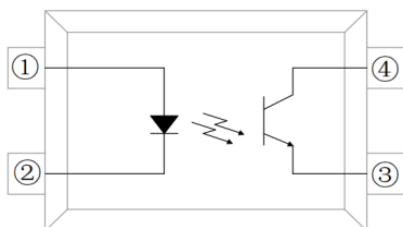


Description

PC357C devices consist of an AlGaAs infrared emitting diodes, optically coupled to a Silicone NPN phototransistor detector. There are packaged in a 4-pin small outline package (SOP4) and are available in tape and reel packing format.



PIN Configuration

- ① Anode
- ② Cathode
- ③ Emitter
- ④ Collector

Features

- Current transfer ratio
(CTR: 50~600% at $I_F=5mA, V_{CE}=5V$)
- High input-output isolation voltage
(Viso=3750Vrms)
- Creepage distance >5.00mm
- Operating temperature up to +110°C
- RoHS REACH compliance
- Compliance Halogen Free
- MSL Level 1

Applications

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as fan, heaters, etc.

Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I _F	60	mA
	Peak Forward Current*1	I _{FP}	1	A
	Reverse Voltage	V _R	6	V
	Power Dissipation	P _D	100	mW
	No Derating Required Up to T _a = 100°C		2.9	mW/°C
Output	Power Dissipation	P _C	150	mW
	Derating Factor (above T _a = 80°C)		5.8	mW/°C
	Collector Current	I _C	50	mA
	Collector-Emitter Voltage	V _{CEO}	35	V
	Emitter-Collector Voltage	V _{ECO}	7	V
Total Power Dissipation		P _{TOT}	200	mW
Isolation Voltage*2		V _{ISO}	3750	V _{rms}
Peak Isolation Voltage		V _{IORM}	707	V _{peak}
Transient Isolation Voltage		V _{IOTM}	3750	V _{peak}
Operating Temperature		T _{OPR}	-55~110	°C
Storage Temperature		T _{STG}	-55~125	°C
Soldering Temperature		T _{SOL}	260	°C

*1 100 μs pulse, 100Hz frequency

*2 AC for 1 minute, R.H. = 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

Electro-Optical Characteristics ($T_a=25^{\circ}\text{C}$)

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	V_F	---	1.20	1.4	V	$I_F=10\text{mA}$
Reverse Current	I_R	---	---	10	μA	$V_R=6\text{V}$
Input Capacitance	C_{in}	---	10	100	pF	$V=0$, $f=1\text{kHz}$

Output

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Collector-Emitter Dark Current	I_{CEO}	---	---	100	nA	$V_{CE} = 20\text{V}$, $I_F = 0\text{mA}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	35	---	---	V	$I_C=0.1\text{mA}$
Emitter-Collector Breakdown Voltage	BV_{ECO}	7	---	---	V	$I_E=0.1\text{mA}$

Transfer Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	---	0.06	0.2	V	$I_F=20mA, I_C=1mA$
Isolation Resistance	R_{IO}	5×10^{10}	---	---	Ω	$V_{IO}=500V_{dc}$, 40~60% R.H.
Floating Capacitance	C_{IO}	---	0.6	1.0	pF	$V_{IO}=0, f=1MHz$
Cut-Off Frequency*4	F_c	---	80	---	kHz	$V_{CE}=2V, I_C=2mA$, $R_L=100\Omega$, -3dB
Rise Time*3	t_r	---	6	18	us	$V_{CE}=2V, I_C=2mA$, $R_L=100\Omega$
Fall Time*3	t_f	---	8	18	us	

*3 Fig.12&13

*4 Fig.14

Current Transfer Ratio Binning

Binning		Symbol	Min.	Typ.	Max.	Unit	Condition
Current Transfer Ratio	PC357C	CTR	200	---	400	%	$I_F=5mA$, $V_{CE}=5V$

* Typical values at $T_a = 25^\circ C$

Typical Electro-Optical Characteristics Curves

Fig.1 Forward Current vs. Ambient Temperature

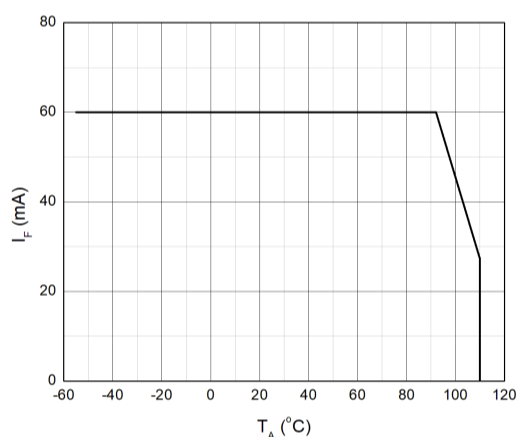


Fig. 2 Collector Power Dissipation Vs.Ambient Temperature

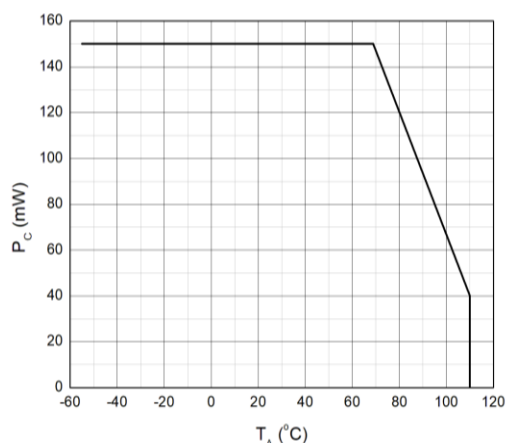


Fig.3 Forward Current vs.Forward Voltage

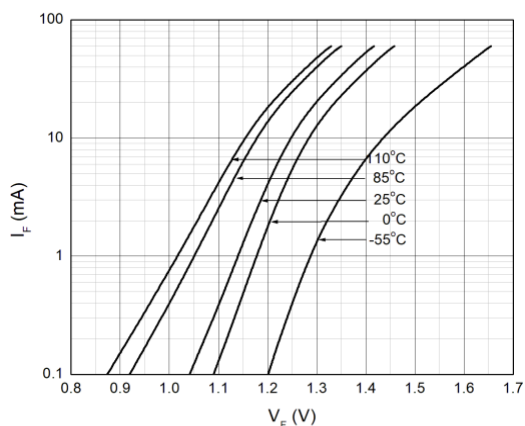


Fig. 4 Collector Dark Current vs.Ambient Temperature

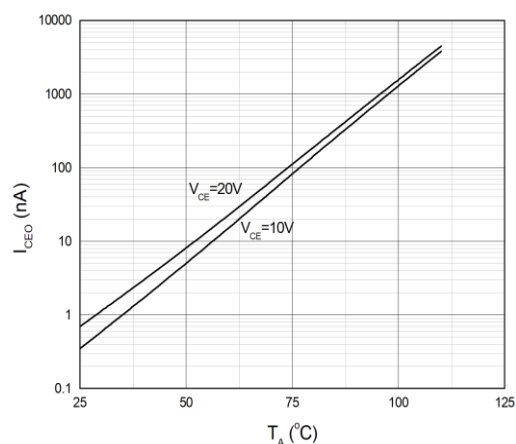


Fig.5 Collector Current vs.Collector-emitter Voltage

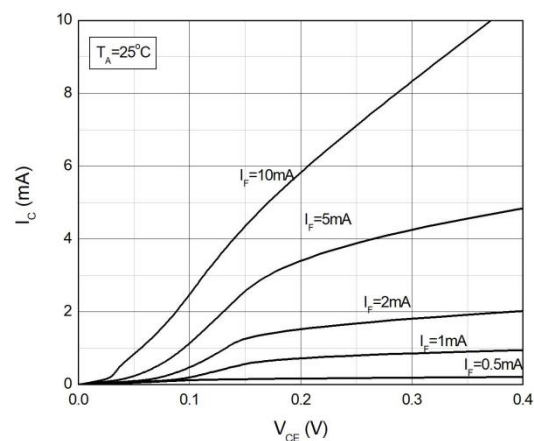
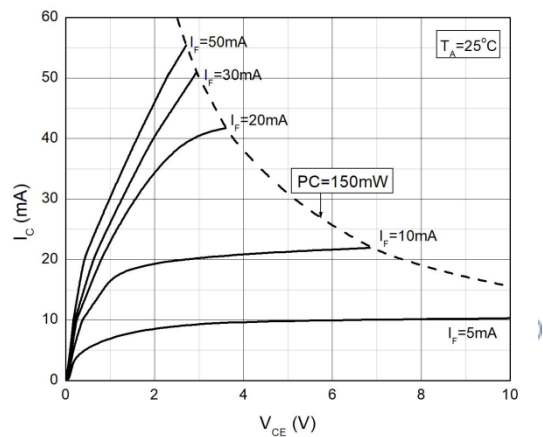


Fig.6 Collector Current vs.Collector-emitter Voltage



Typical Electro-Optical Characteristics Curves

Fig.7 Normalized Current Transfer Ratio
vs. Forward Current

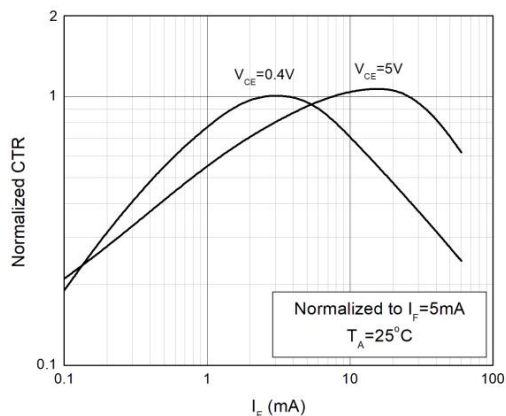


Fig.8 Normalized Current Transfer Ratio
vs. Ambient Temperature

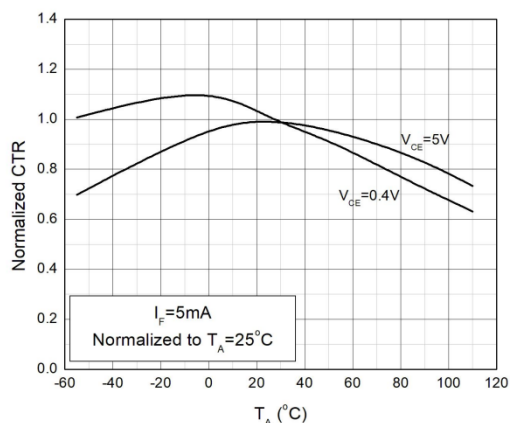


Fig.9 Collector-emitter Saturation Voltage
vs. Ambient Temperature

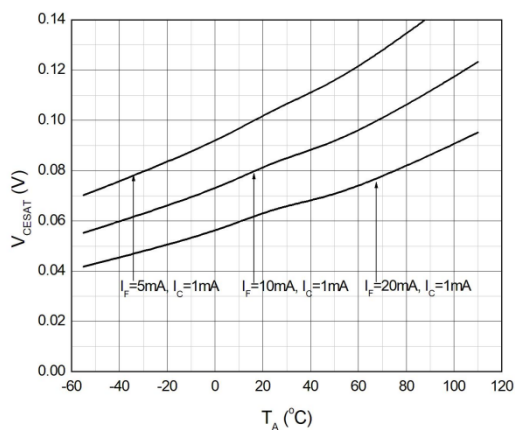


Fig.10 switching Time vs. Load Resistance

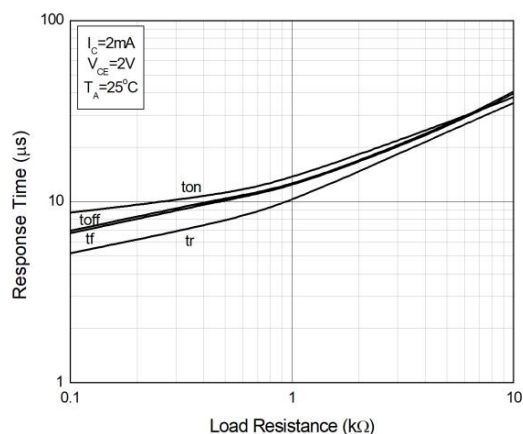


Fig.11 Frequency Response

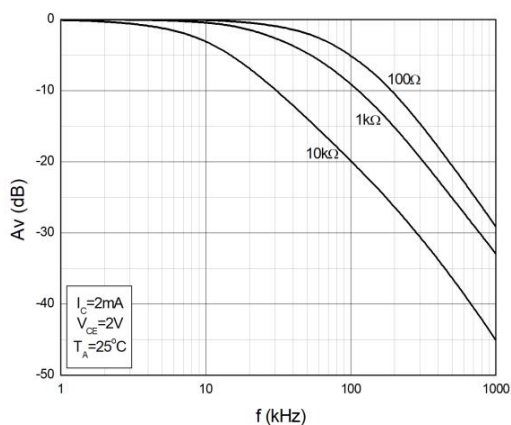
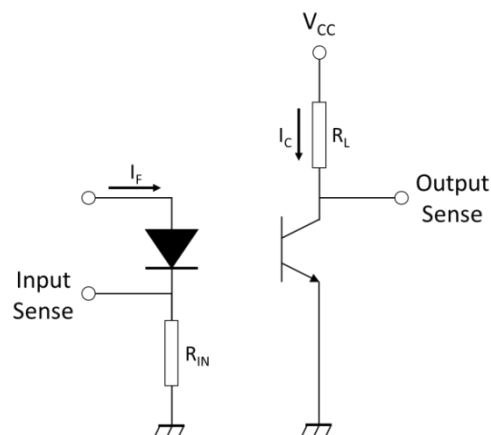


Fig.12 Test Circuits of Response Time



Typical Electro-Optical Characteristics Curves

Fig.13 Curves of Response Time

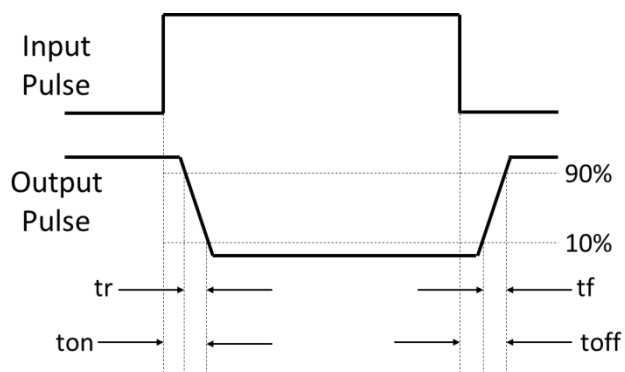
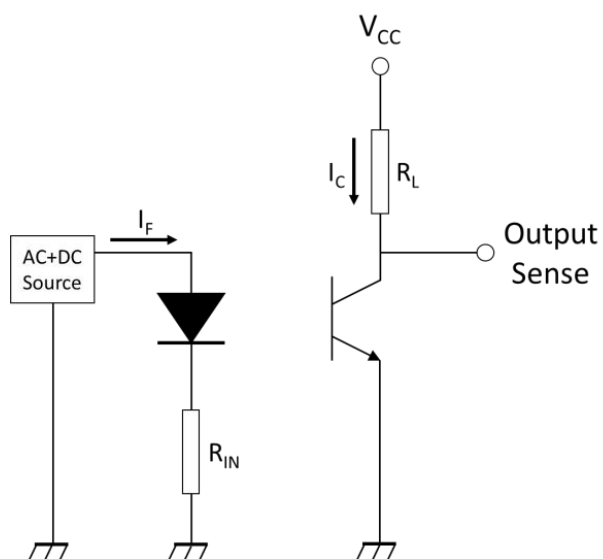
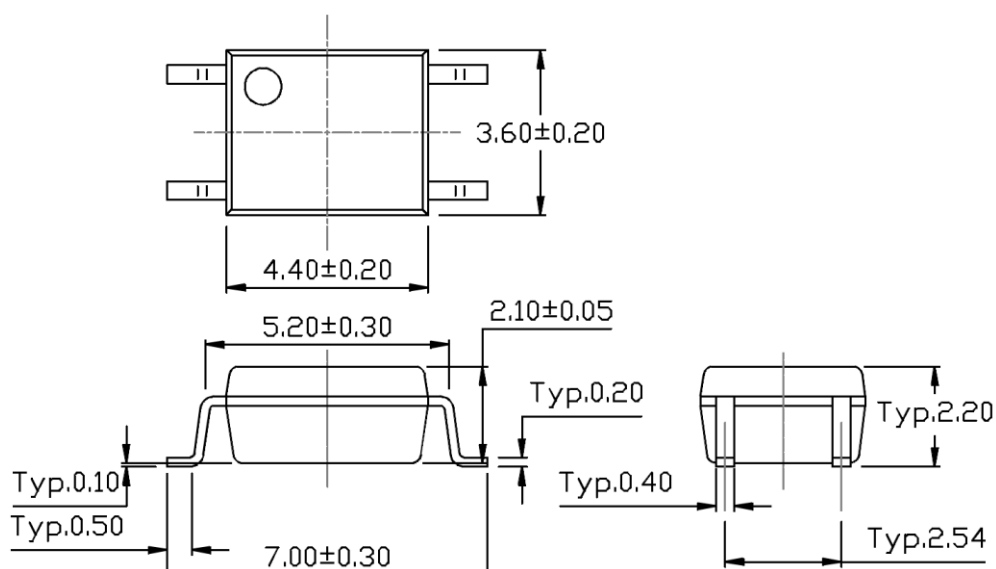


Fig.14 Test Circuits of Frequency Response



Package Dimension (Unit: mm)

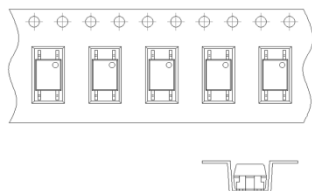


Notes:

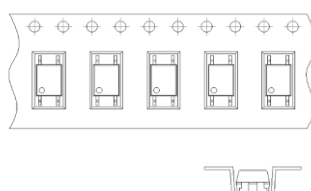
1. All dimensions are in millimeters.
2. Tolerances dimensions $\pm 0.3\text{mm}$ unless otherwise specified.

Packing Specification Tape & Reel Packing Specifications

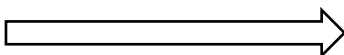
T1



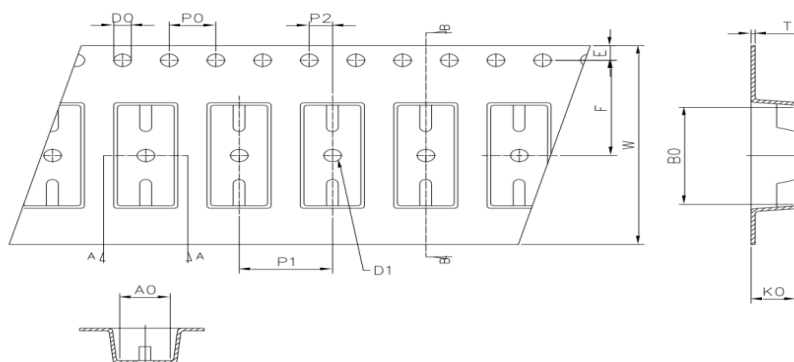
T2



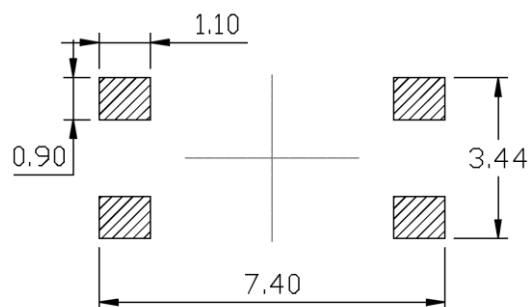
Direction of feed from reel



Carrier Tape Dimensions: Loaded Quantity 3000 pcs Per Reel

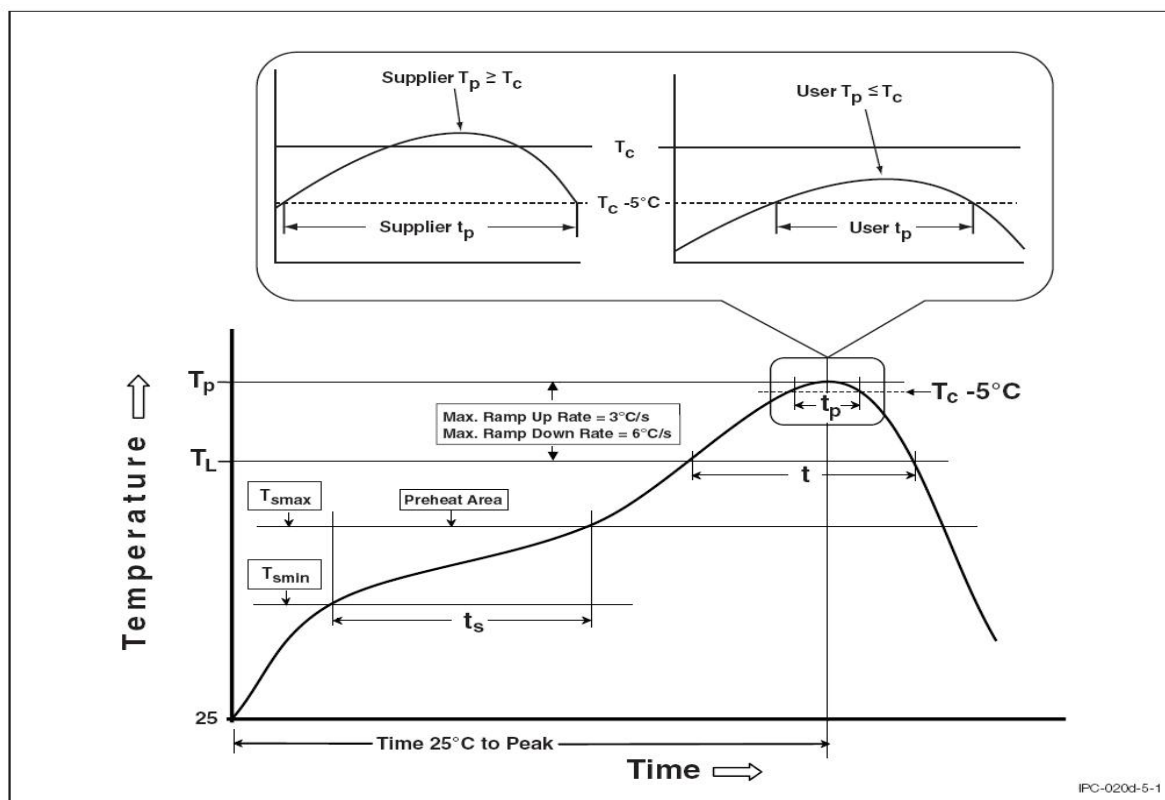


Dimension No.	A0	B0	D0	D1	E	F
Dimension (mm)	3.80 ± 0.10	7.40 ± 0.10	1.5 ± 0.10	1.50 ± 0.25	1.75 ± 0.10	7.50 ± 0.05
Dimension No.	P0	P1	P2	t	W	K0
Dimension (mm)	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.10	0.3 ± 0.05	16.00 ± 0.30	2.45 ± 0.10



1. Soldering Condition

Maximum Body Case Temperature Profile For Evaluation of Reflow Profile



1. Soldering Condition (cont.)

Preheat	Condition
Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 sec
Average Ramp-Up Rate (T_{smax} to T_P)	3 °C/sec max
Other	Condition
Liquidus Temperature (T_L)	217 °C
Time Above Liquidus Temperature (T_L)	60-100 sec
Peak Temperature (T_P)	260°C
Time within 5 °C of Actual Peak Temperature: $T_P - 5^{\circ}\text{C} / T_c$	30 sec
Ramp- Down Rate From Peak Temperature	6°C /sec max
Time 25°C to Peak Temperature	8 minutes max
Max. Reflow Times	3 times