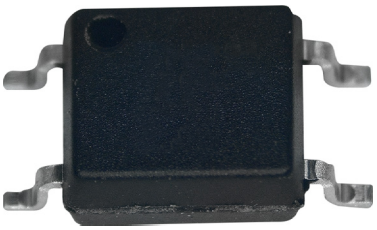
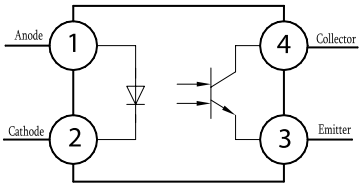
Phototransistor Optocoupler

multicomp PRO

RoHS Compliant





Features:

- Current transfer ratio
- (CTR: 80~600% at IF = 5mA, VCE = 5V)
- High isolation voltage between input and output (Viso =3750V rms)
- Collector - emitter breakdown voltage BVCEO ≥ 80V
- Operating Temperature: -55°C~110°C
- VDE : 40060715
- UL : E340048
- CQC : CQC24001452346

Applications:

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as Fan Heaters, etc
- Signal transmission between circuits of different potentials and impedances

Mechanical Data

- Case: SOP4
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Maximum Ratings: @ T_A 25°C unless otherwise specified.

Parameter		Symbol	Value	Unit
Input	Forward Current	I_F	50	mA
	Peak Forward Current *1	I_{FM}	1	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	70	mW
Output	Collector Power Dissipation	P_C	150	mW
	Collector Current	I_O	50	mA
	Collector-Emitter Voltage	V_{CEO}	80	V
	Emitter-Collector Voltage	V_{ECO}	7	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Total Power Dissipation	P_{TOT}	200	mW
Isolation Voltage *2	V_{ISO}	3750	Vrms
Rated Impulse Isolation Voltage	V_{IOTM}	5000	V
Rated Repetitive Peak Isolation Voltage	V_{IORM}	600	V
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	430	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	350	°C/W
Thermal Resistance Junction-to-Lead	$R_{\theta JL}$	368	°C/W
Operating Temperature	T_{OPR}	-55 ~ +110	°C
Storage Temperature Range	T_{STG}	-55 ~ +125	°C
Soldering Temperature *3	T_{SOL}	260	°C

Notes
1. Pulse width≤1μs, Duty ratio: 0.001
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

Electrical Characteristics @ T_A = 25°C unless otherwise specified

Parameter		Symbol	Test conditions	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	I_F = 20mA	-	1.2	1.4	V
	Peak Forward Voltage	V_{FM}	I_{FM} = 0.5A	-	-	3.0	V
	Reverse Current	I_R	V_R = 4V	-	-	10	μA
	Input Capacitance	C_{in}	V_R = 0V, f = 1kHz	-	30	250	pF
Output	Collector-Emitter Dark Current	I_{CEO}	V_{CE} = 20V, I_F = 0	-	-	100	nA
	Collector-Emitter Breakdown Voltage	B_{VCEO}	I_C = 0.1mA, I_F = 0	80	-	-	V
	Emitter-Collector Breakdown Voltage	B_{VECO}	I_E = 10μA, I_F = 0	7	-	-	V
Transfer Characteristics	Collector Current	I_C	I_F = 5mA , V_{CE} = 5V	2.5	-	30	mA
	Current Transfer Ratio	C_{TR}	I_F = 5 mA, V_{CE} = 5V	80	-	600	%
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 20mA, I_C = 1mA	-	0.1	0.2	V
	Isolation Resistance	R_{ISO}	V_{IO} = 500V DC 40~60% R.H.	1×10^{12}	-	-	Ω
	Isolation current	R_{isc}	6000V DC, 40~60%R.H	-	-	2	μA
	Floating Capacitance	C_{IO}	V_{IO} = 0, f = 1MHz	-	0.6	1.0	pF

Parameter		Symbol	Test conditions	Min.	Typ.	Max.	Unit
Transfer Characteristics	Cut-off frequency	fc	V_{CE} = 5V, I_C = 2mA R_L=100Ω, -3dB	-	80	-	kHz
	Turn On Time	T_{on}	V_{CE}=2V, R_L= 100Ω I_C=2mA		4	18	μs
	Turn Off Time	T_{off}			3	18	

Rank Table of Current Transfer Ratio CTR

Rank Mark	Min. (%)	Max. (%)	Condition
A	80	160	I_F = 5 mA, V_{CE} = 5V
B	130	260	
C	200	400	
D	300	600	
E	100	200	
F	150	300	
No mark	80	600	

Ratings and Characteristics Curves: (@ T_A = 25°C unless otherwise specified)

Fig.1 Allowable Forward Current vs. Ambient Temperature

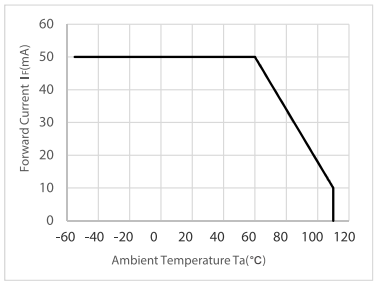


Fig.2 Allowable collector power disspation vs. Ambient Temperature(°C)

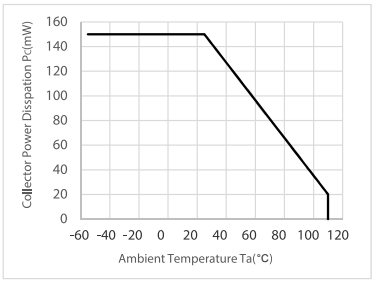


Fig.3 Relative Current Transfer Ratio vs. Forward Current

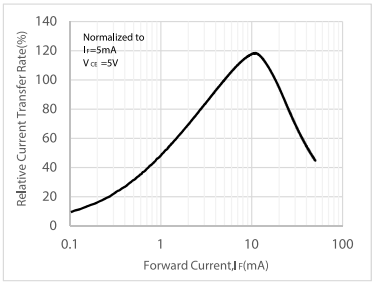


Fig4 Forward Current vs. Forward Voltage

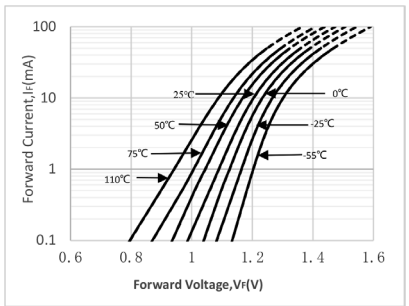


Fig.5 Collector Current vs. Collector-emitter Voltage

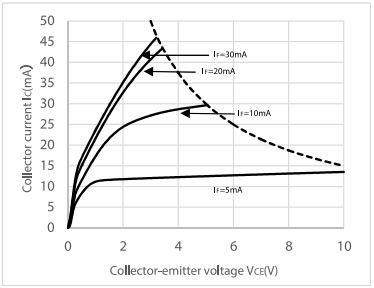


Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature

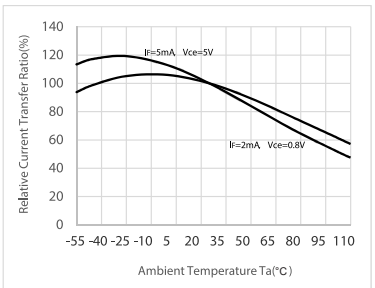


Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

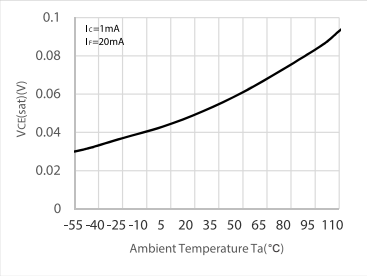


Fig.8 Collector Dark Current vs. Ambient Temperature

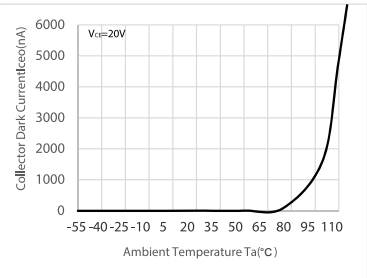


Fig.9 Response Time vs. Load Resistance

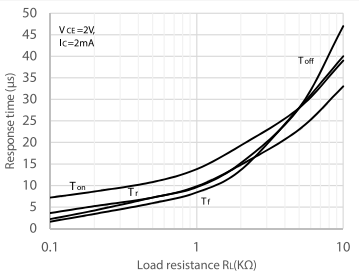


Fig.10 Frequency Response

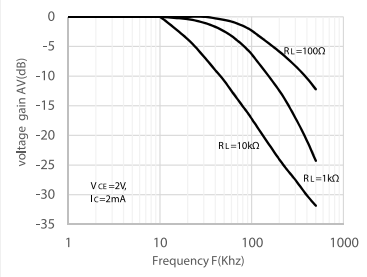


Fig.11 Collector-emitter Saturation Voltage vs. Forward Current

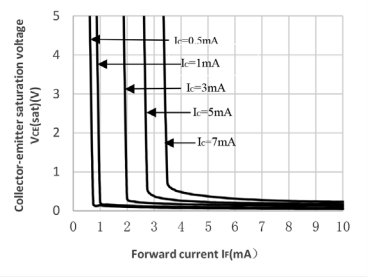
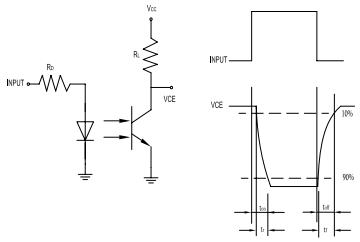
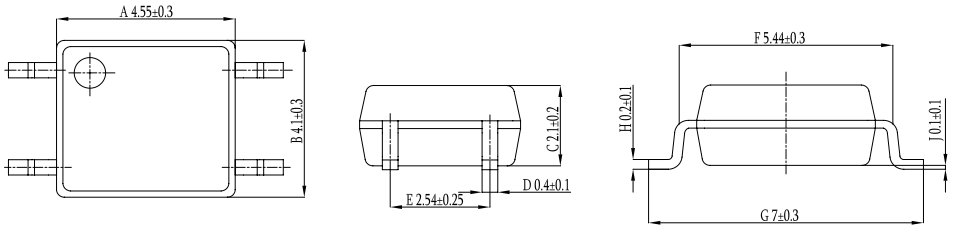


Fig.12 Switching Time Test Circuit & Waveforms



Outline Dimensions



Dimensions : Millimetres

Part Number Table

Description	Part Number
Optocoupler, Phototransistor, 50mA, 1V, 3750Vrms	BL357D