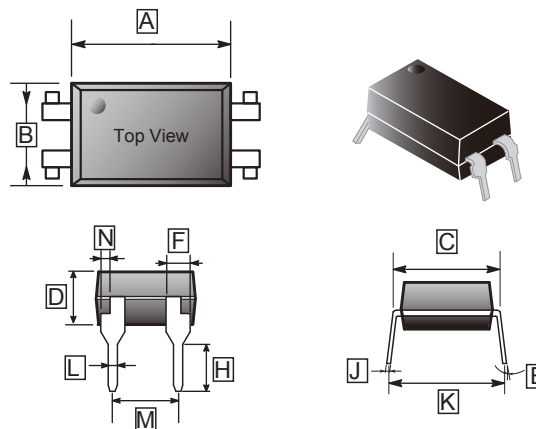


RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

## DESCRIPTION

The BL817 Series of devices each consist of an infrared Emitting diodes, optically coupled to a phototransistor detector. They are packaged in a 4-pin DIP package and available in Wide-lead spacing and SMD option.

## DIP4



## FEATURES

- Current transfer ratio (CTR : 50%~600% @  $I_F=5\text{mA}$ ,  $V_{CE}=5\text{V}$ )
- High isolation voltage between input and output ( $V_{iso} = 5000\text{V rms}$ )
- Creepage distance > 7.62mm

## 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

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min..	Max
A	6.30	6.70	H	2.60	3.00
B	4.40	4.80	J	0.20	0.30
C	7.35	7.70	K	8.65	9.35
D	3.20	3.75	L	0.50 TYP.	
E	2°	8°	M	2.35	2.70
F	1.25 TYP.		N	0.40 TYP.	

## RANK TABLE OF CURRENT TRANSFER RATIO CTR

Product-Rank	BL817-L	BL817-A	BL817-B	BL817-C	BL817-D	BL817
Range(%)	50~100	80~160	130~260	200~400	300~600	50~600

Note :

1. Conditions :  $I_F=5\text{mA}$ ,  $V_{CE}=5\text{V}$ ,  $T_A=25^\circ\text{C}$

**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter		Symbol	Rating	Unit
Input	Forward Current	$I_F$	50	mA
	Reverse Voltage	$V_R$	6	V
	Power Dissipation	P	70	mW
Output	Collector-Emitter Voltage	$V_{CEO}$	70	V
	Emitter-Collector Voltage	$V_{ECO}$	6	
	Collector Current	$I_C$	50	mA
	Collector Power Dissipation	$P_C$	150	mW
Total Power Dissipation		$P_{tot}$	200	mW
Isolation Voltage <sup>1</sup>		$V_{iso}$	5000	V rms
Rated impulse isolation voltage		$V_{IOTM}$	6000	V
Rated repetitive peak isolation voltage		$V_{IORM}$	630	V
Operating Temperature		$T_{opr}$	-30~100	°C
Storage Temperature		$T_{stg}$	-55~125	
Soldering Temperature <sup>2</sup>		$T_{sol}$	260	

Note :

- AC For minute, R.H.=40~60%, Isolation voltage shall be measured using the following method.
  - Short between anode and cathode on the primary side and between collector and emitter on the secondary side.
  - The isolation voltage tester with zero-cross circuit shall be used.
  - The waveform of applied voltage shall be a sine wave.
- For 10 Seconds.

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input	Forward Voltage	$V_F$	-	1.2	1.4	V	$I_F=20\text{mA}$
	Reverse Current	$I_R$	-	-	10	$\mu\text{A}$	$V_R=4\text{V}$
	Terminal Capacitance	$C_t$	-	30	250	pF	$V=0, f=1\text{KHz}$
Output	Collector Dark Current	$I_{CEO}$	-	-	100	nA	$V_{CE}=20\text{V}, I_F=0$
	Collector-Emitter Breakdown Voltage	$BV_{CEO}$	35	-	-	V	$I_C=0.1\text{mA}, I_F=0$
	Emitter-Collector Breakdown Voltage	$BV_{ECO}$	6	-	-	V	$I_E=10\mu\text{A}, I_F=0$
TRANSFER CHARACTERISTICS	Collector Current	$I_C$	2.5	-	30	mA	$V_{CE}=5\text{V}, I_F=5\text{mA}$
	Current Transfer Ratio <sup>1</sup>	CTR	50	-	600	%	
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	0.1	0.2	V	$I_F=20\text{mA}, I_C=1\text{mA}$
	Isolation Resistance	$R_{ISO}$	$5 \times 10^{10}$	$1 \times 10^{11}$	-	$\Omega$	DC500V, 40~60%R.H.
	Floating Capacitance	$C_F$	-	0.6	1	pF	$V=0, f=1\text{MHz}$
	Cut-Off Frequency	$f_C$	-	80	-	KHz	$V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$
	Response Time(Rise)	$t_r$	-	4	18	$\mu\text{s}$	$V_{CE}=2\text{V}, I_C=2\text{mA} R_L=100\Omega$
Response Time(Fall)	$t_f$	-	3	18	$\mu\text{s}$		

Note :

- $CTR = I_C / I_F \times 100\%$

**CHARACTERISTIC CURVE**

Fig.1 Forward Current vs. Ambient Temperature

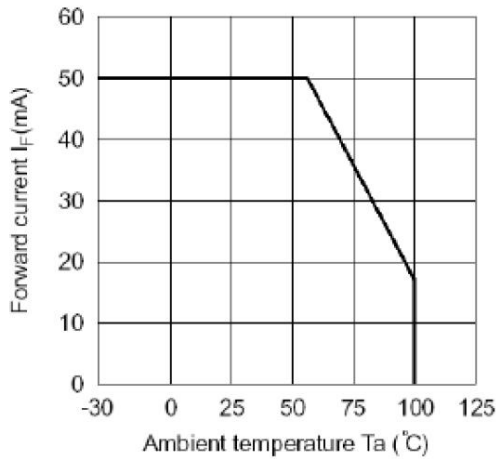


Fig.2 Collector Power Dissipation vs. Ambient Temperature

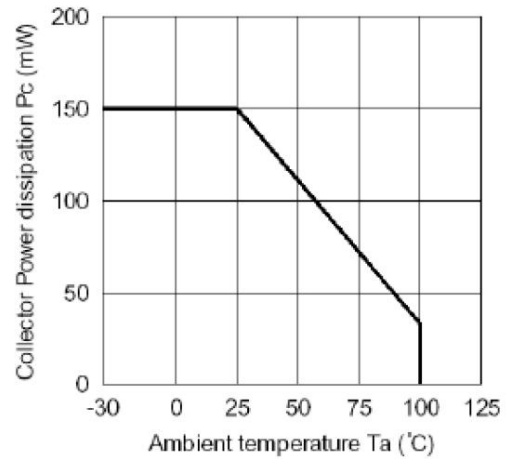


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

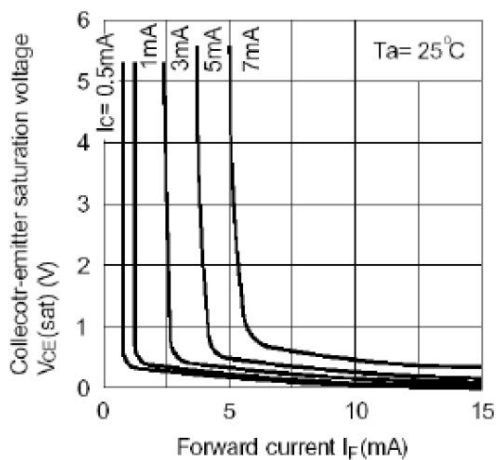


Fig.4 Forward Current vs. Forward Voltage

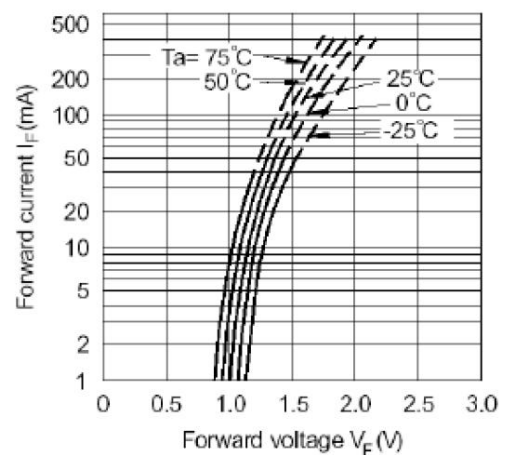


Fig.5 Current Transfer Ratio vs. Forward Current

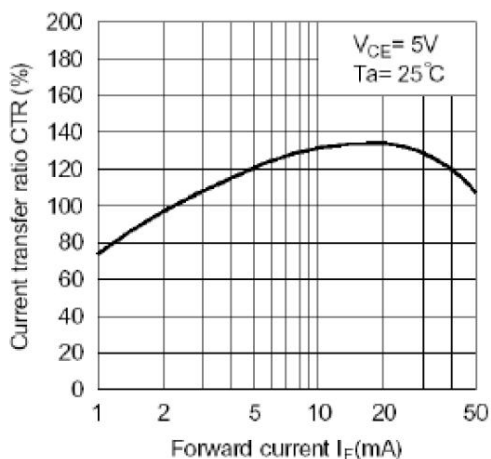
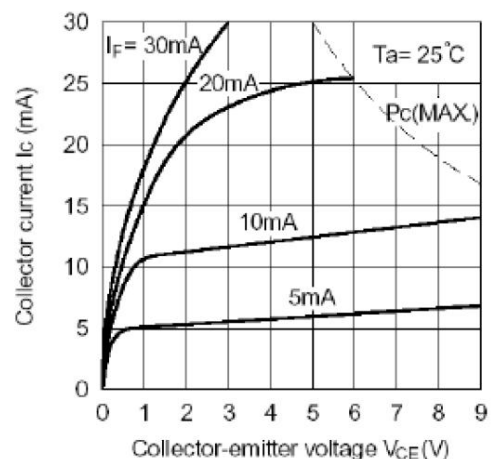


Fig.6 Collector Current vs. Collector-emitter Voltage



**CHARACTERISTIC CURVE**

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

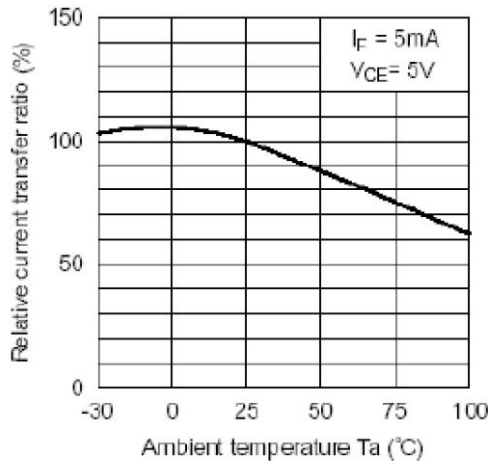


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

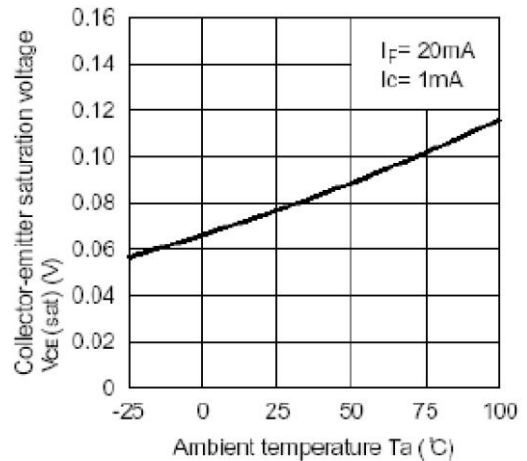


Fig.9 Collector Dark Current vs. Ambient Temperature

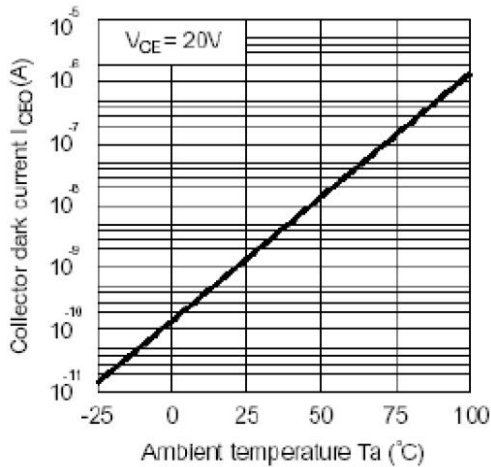


Fig.10 Response Time vs. Load Resistance

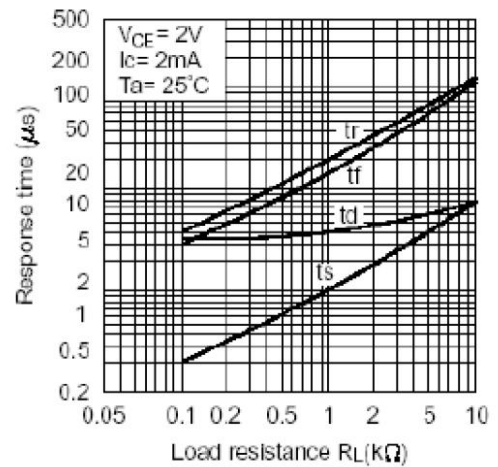
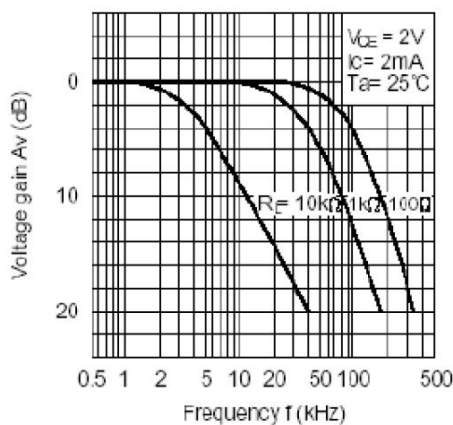
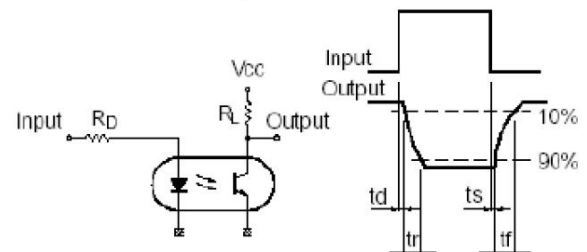


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

