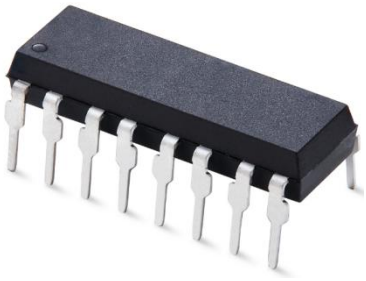
1. Features

(1) AC input response.
(2) Current transfer ratio (CTR : MIN. 20% at IF = ±1mA, VCE = 5V)
(3) Wide Operating temperature range -55~110ºC
(4) High input-output isolation voltage (V_{iso} = 5,000Vrms)
(5) Response time (tr : TYP. 4us at V_{CE} = 2V, I_C = 2mA, R_L = 100)
(6) High collector-emitter voltage (V_{CE} ≧ 80V)
(7) MSL Class Ⅰ



2. Description

(1) The SL844 series of four channel devices each consist of two infrared emitting diodes, connected in inverse parallel, optically coupled to a photo transistor detector.

(2) They are packaged in a 4-pin DIP package and available in side-lead spacing and SMD option.

3. Applications

(1)AC line monitor
(2)Programmable controllers
(3)Telephone line interface
(4)Unknown polarity DC sensor

4. Absolute Maximum Ratings at Ta=25℃

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I_F	±50	mA
	Peak forward current (100μs pulse, 100Hz frequency)	I_{FP}	1	A
	Reverse Voltage	V_R	6	V
	Consume Power	P	70	mW
Output	Collector and emitter Voltage	V_{CEO}	80	V
	Emitter and collector Voltage	V_{ECO}	7	
	Collector Current	I_C	50	mA
	Consume Power	P_C	150	mW
Total Power Dissipation		P_{tot}	200	mW
*1 Isolation Voltage		V_{iso}	5,000	Vrms
Operating Temperature		T_{opr}	-50 to + 110	℃
Storage Temperature		T_{stg}	-55 to + 125	
*2 Soldering Temperature		T_{sol}	260	

1. AC For 1 Minute, R.H. = 40 ~ 60%

Isolation voltage shall be measured using the following method.

(1) Short between anode and cathode on the primary side and between collector and emitter 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

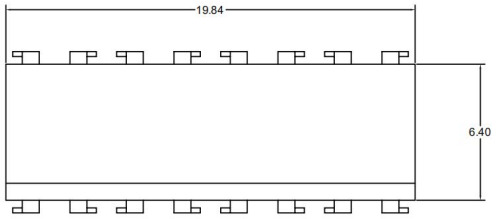
5. Electro-Optical Characteristics (Ta=25℃ unless specified otherwise)

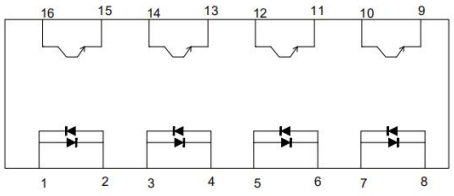
Parameter		Symbol	Condition	Min	Typ.*	Max	Unit
Input	Forward Current	V_F	I_F=±20mA	---	1.2	1.4	V
	Collector capacitance	C_t	V=0, f=1KHz	---	30	250	pF
Output	Collector to emitter Current	I_{CEO}	V_{CE}=20V, I_F=0mA	---	---	100	nA
	Collector and Emitter attenuation Voltage	BV_{CEO}	I_C=0.1mA I_F=0mA	80	---	---	V
	Emitter and Collector attenuation Voltage	BV_{ECO}	I_E=0.1mA I_F=0mA	7	---	---	V
Transforming Characteristics	*1 Current conversion ratio	CTR	I_F=±1mA V_{CE}=5V	20	---	300	%
	Collector Current	I_C		0.2	---	3	mA
	Collector and Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=±20mA I_C= 1mA	---	0.1	0.2	V
	Insulation Impedance	R_{iso}	DC500V 40~60%R.H.	5×10^{10}	1×10^{12}	---	Ω
	Floating Capacitance	C_f	V=0, f=1MHz	---	0.6	1.0	pF
	Cut-off Frequency	f_c	V_{CE}=5V, I_C=2mA R_L=100Ω, -3dB	---	80	---	kHz
	Rise Time	t_r	V_{CE}=2V, I_C=2mA R_L=100Ω	---	4	18	μs
	Descend Time	t_f		---	3	18	μs

*1 Current Conversion Ratio = I_C / I_F × 100%, CTR Tolerance:±3%.

7. Package Dimension (Unit：mm）

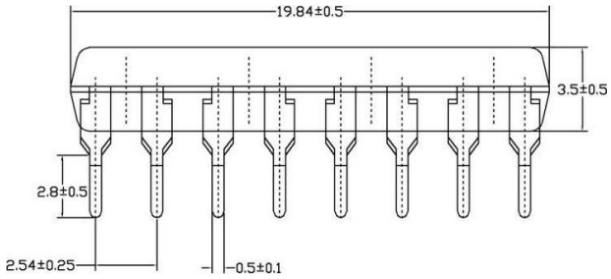
1.SL844

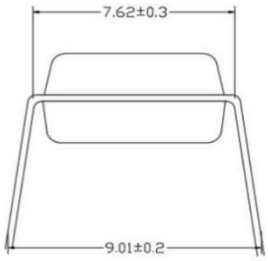




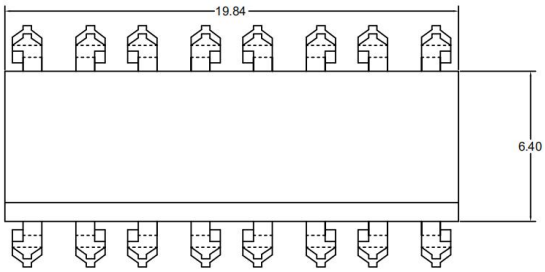
pin No. and Internal connection diagram

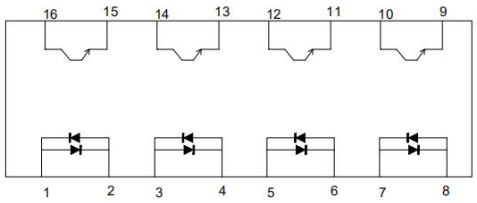
1~8 Anode/Cathode
9.11.13.15 Emitter
10.12.14.16 Collector





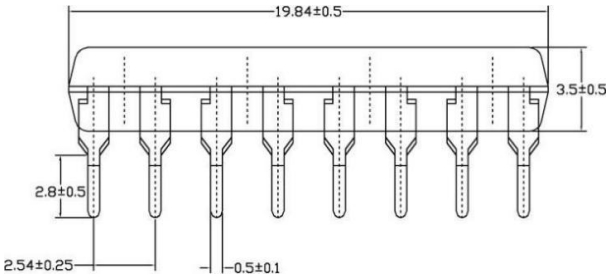
2.SL844M

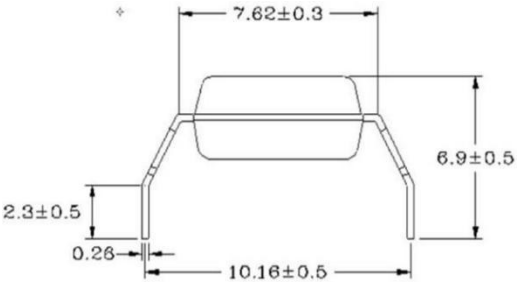




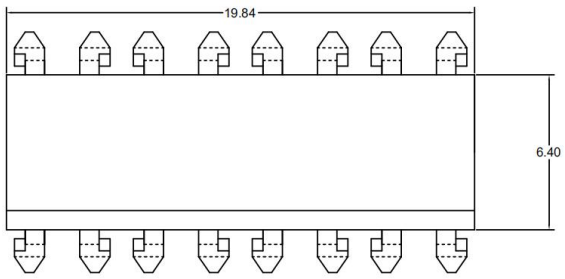
pin No. and Internal connection diagram

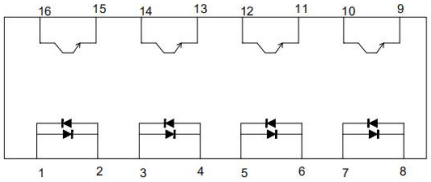
1~8 Anode/Cathode
9.11.13.15 Emitter
10.12.14.16 Collector





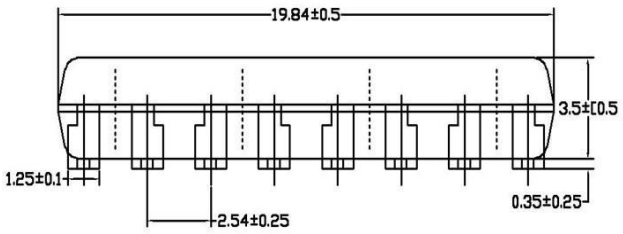
3. SL844S

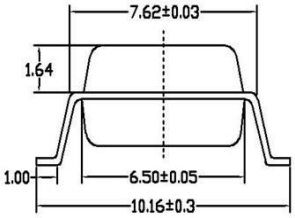




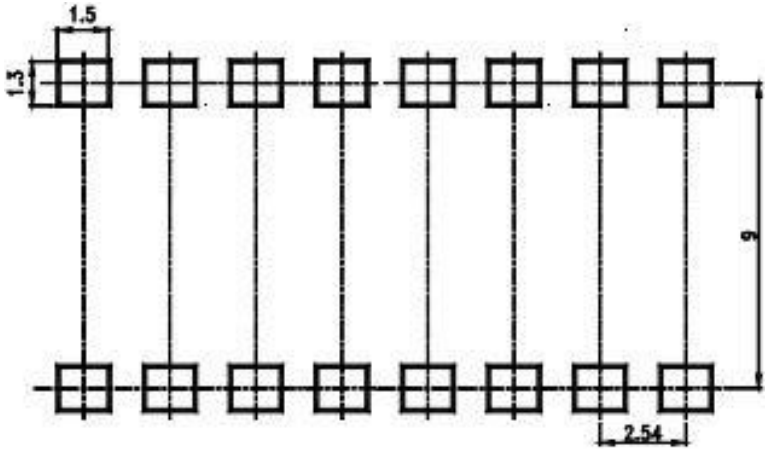
pin No. and Internal connection diagram

1~8 Anode/Cathode
9.11.13.15 Emitter
10.12.14.16 Collector





8. Recommended Foot Print Patterns (Mount Pad) (Unit：mm）



9. Reliability Test

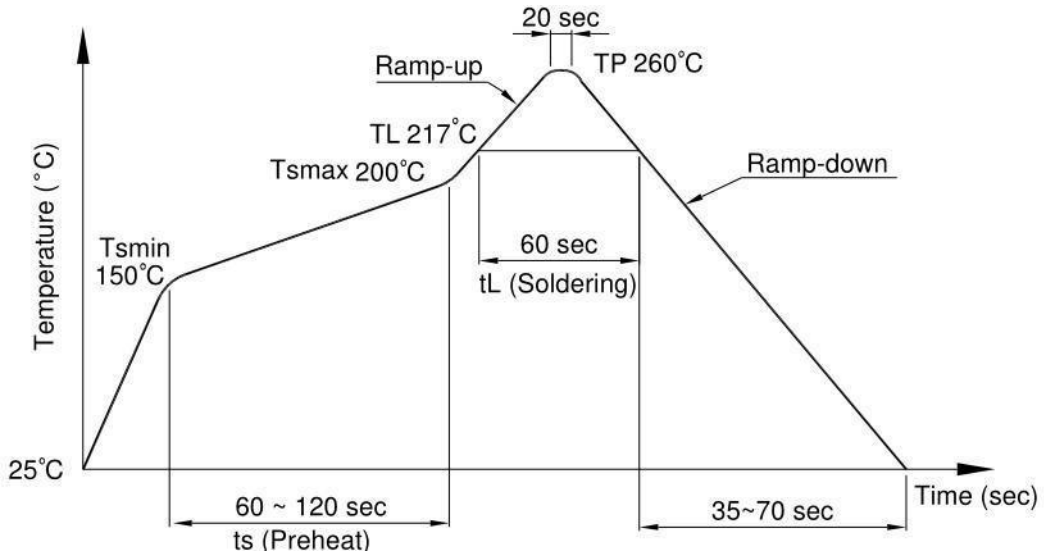
NO.	Item	Condition	Quantity	Cycle	Reference Standards
1	RSH, Resistance to Solder Heat	260±5°C,20s/cycle	22	3 cycles	JESC22A-106
2	SD, Solderability	260±5°C, 10s/cycle	22	1 cycle	JESD22-B102
3	TC, Temperature Cycle	H： 125°C 15min ∫ 5min L: -55°C 15min	77	300cycles	JESC22A-104
4	TS, Thermal Shock	H:100°C 5min ∫ 15s L:-10°C 5min	77	300cysles	JESC22A-106
5	LTSL, Low Temperature Storage	T:-55°C	77	1000h	JESD22-A119
6	HTSL, High Temperature Storage	T:125°C	77	1000h	JESC22A-103
7	THB, High Temperature High Humidity	T:85°C RH： 85%	77	1000h	JESC22A-101
8	HTOL DC Operating Life	T： 110°C IF=10mA VCC=5V	77	1000h	MIL-STD-750 Method 1037
9	ESD-HBM Human Body Model ESD	Ta=25° C, Reference JESD22-A114	6	1 cycle	JESD22-A114

10. Temperature Profile Of Soldering

(1).IR Reflow soldering (JEDEC-STD-020C compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

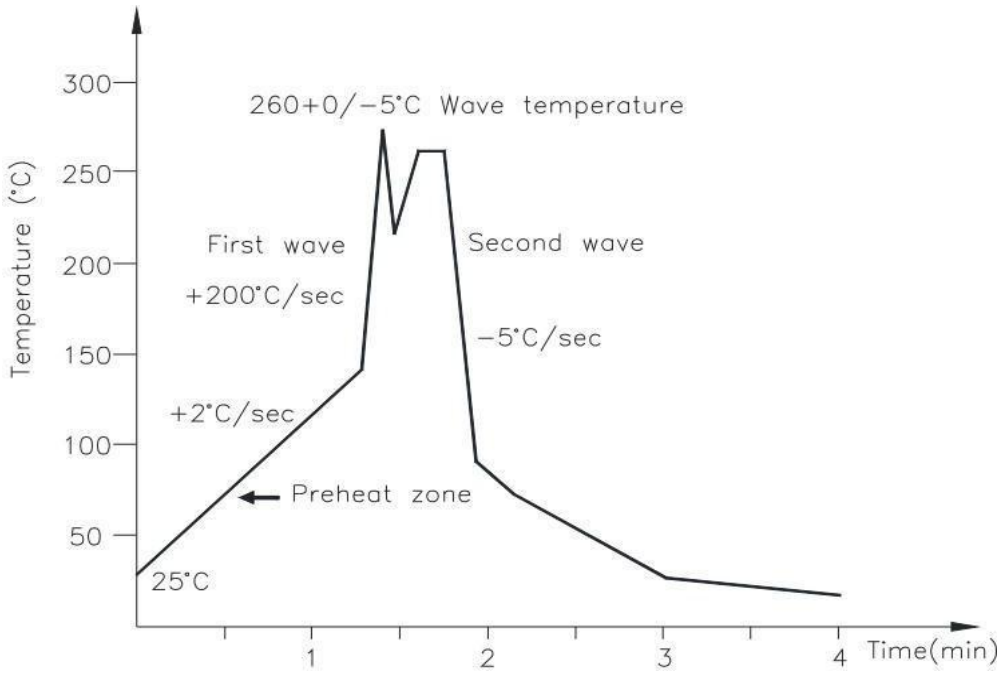
Profile item	Conditions
Preheat - Temperature Min (T Smin) - Temperature Max (T Smax) - Time (min to max) (ts)	 150˚C 200˚C 90±30 sec
Soldering zone - Temperature (TL) - Time (t L)	 217˚C 60 sec
Peak Temperature	260˚C
Peak Temperature time	20 sec
Ramp-up rate	3˚C / sec max.
Ramp-down rate from peak temperature	3~6˚C / sec
Reflow times	≤3



(2).Wave soldering (JEDEC22A111 compliant)

One time soldering is recommended within the condition of temperature.

Temperature Time	260+0/-5˚C 10 sec
Preheat temperature Preheat time	25 to 140˚C 30 to 80 sec



(3).Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

Temperature Time	380+0/-5˚C 3 sec max

11. Characteristics Curves

Fig.1 Forword Current vs. Ambient Temperatute

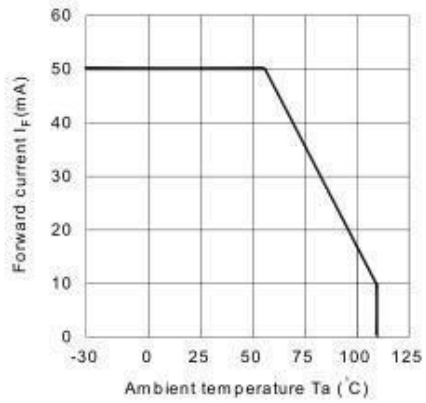


Fig.2 Collector Power Dissipation vs. Ambient Temperature

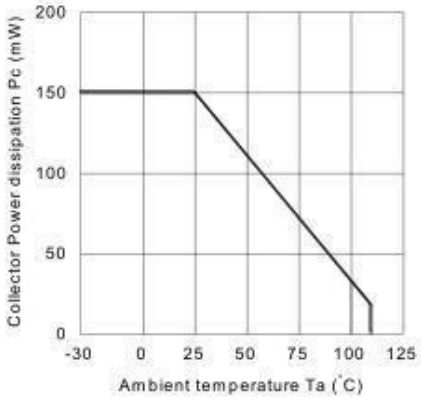


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

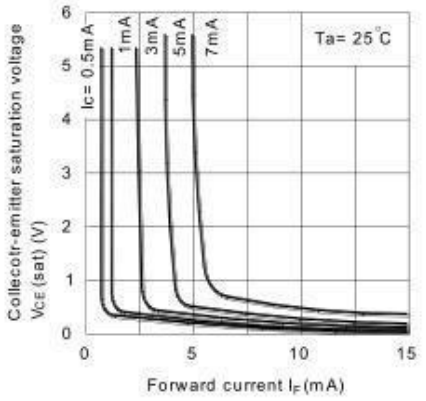


Fig.4 Forward Current vs. Forward Voltage

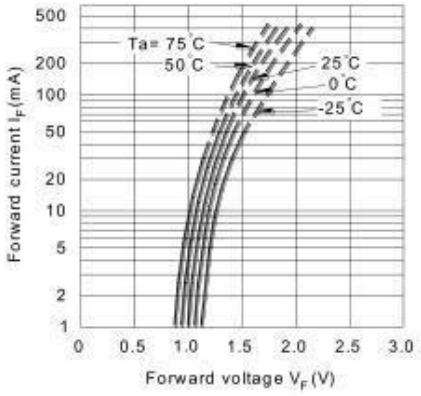


Fig.5 Current Transfer Ratio vs. Forward Current

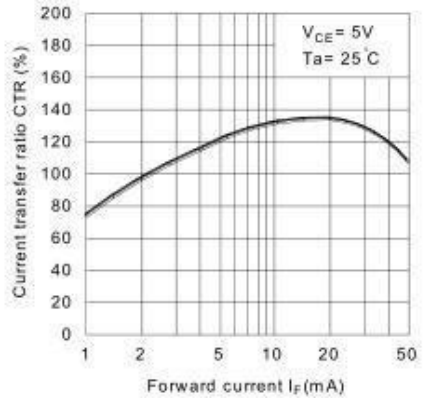


Fig.6 Collector Current vs. Collector-emitter Voltage

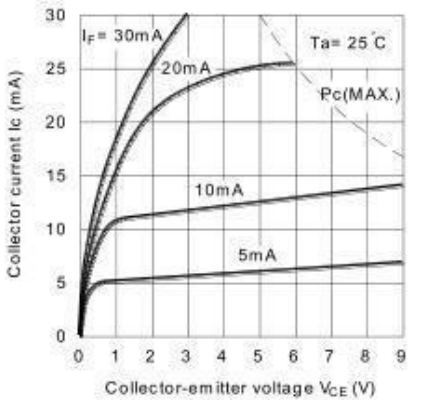


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

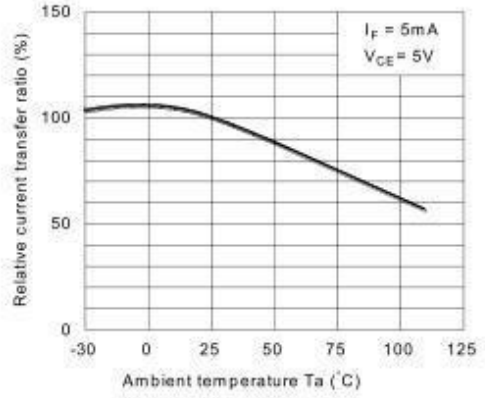


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

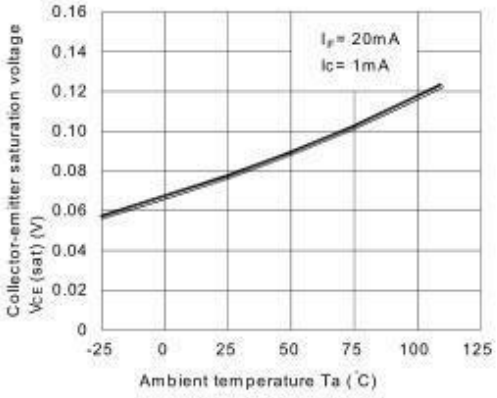


Fig.9 Collector Dark Current vs. Ambient Temperature

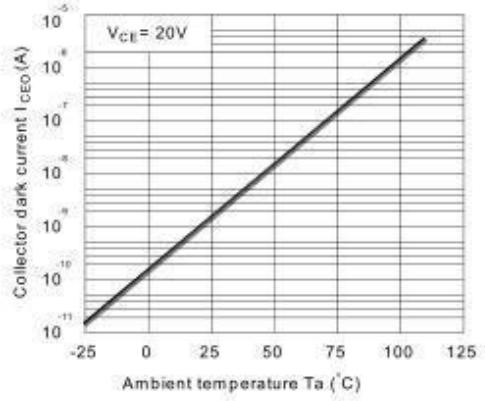


Fig.10 Response Time vs. Load Resistance

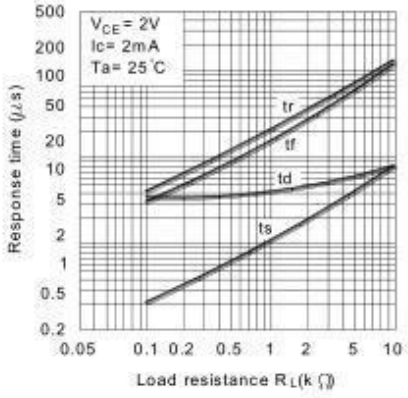
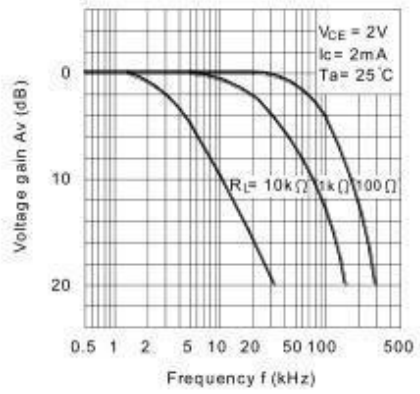
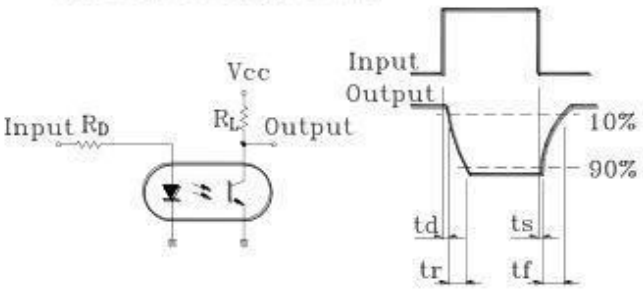


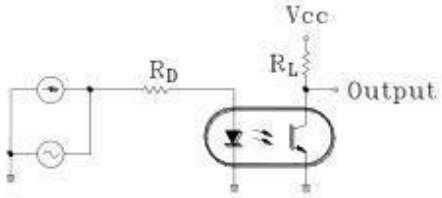
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



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