

MICRO ELECTRONICS

MAL100, A, B

NPN SILICON
PHOTOTRANSISTOR

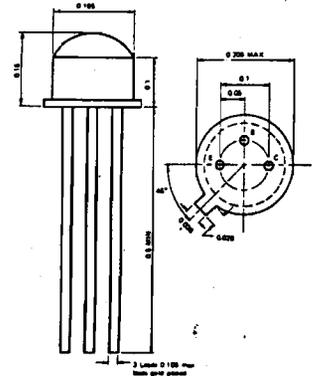
GENERAL DESCRIPTIONS: MAL100, A, B are three terminal NPN silicon planar phototransistors. It features high illumination sensitivity, fast response time and low dark current. Besides, the availability of base lead also allows the circuit designer to optimise their design. It is intended for punched cards and paper tape reader, intrusion alarm sensor, position detector and optical tachometer.

ABSOLUTE MAXIMUM RATING

Continuous Power Dissipation @ $T_A = 25^\circ\text{C}$, P_{max} (note 1 & 2)
 Continuous Power Dissipation @ $T_C = 25^\circ\text{C}$, P_{max} (note 1 & 2)
 Continuous Collector Current, I_C max
 Collector-Base Voltage, V_{CBO} (note 5)
 Collector-Emitter Sustaining Voltage, V_{CEO} (note 3 & 5)
 Operating Junction Temperature Range, T_j
 Storage Temperature Range, T_{stg}
 Relative Humidity at Temperature

100mW
 200mW
 25mA
 50V
 30V
 -55 to +85°C
 -55 to +100°C
 98% at 65°C

T0-18L



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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Collector-Base Breakdown Voltage	V_{CBO}	50	120		V	$I_C = 100\mu\text{A}$ (note 5)
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	30	50		V	$I_C = 1\text{mA}$ (pulsed) (note 5)
Emitter-Collector Breakdown Voltage	V_{ECO}		7		V	$I_{EC} = 100\mu\text{A}$ (note 5)
Collector Dark Current	I_{CBO}		0.25	25	nA	$V_{CB} = 10\text{V}$ (note 5)
Collector Dark Current	I_{CBO}		0.025	0.5	μA	$V_{CB} = 10\text{V}$ $T_A = 65^\circ\text{C}$ (note 5)
Collector Dark Current	I_{CEO}		2	100	nA	$V_{CE} = 5\text{V}$ (note 5)
Responsivity (Tungsten)	R_{CBO}	0.6	1.6		$\mu\text{A}/\text{mW}/\text{cm}^2$	$V_{CB} = 10\text{V}$ (notes 3 & 8)
Responsivity (GaAs)	R_{CBO}	1.8	4.8		$\mu\text{A}/\text{mW}/\text{cm}^2$	$V_{CB} = 10\text{V}$ (notes 4 & 8)
Photo Current (Tungsten)	$I_{CE(L)}$					
MAL100		0.2	1.4		mA	$V_{CE} = 5\text{V}$ $H = 5\text{mW}/\text{cm}^2$
MAL100A		1		3	mA	(notes 3 & 7)
MAL100B		1.3		2.6	mA	
Photo Current (GaAs)	$I_{CE(L)}$	0.6	4.2		mA	$V_{CE} = 5\text{V}$ $H = 5\text{mW}/\text{cm}^2$ (notes 4 & 7)
Light Current Rise Time	t_r		2.8		μsec	(note 6)
Light Current Fall Time	t_f		2.8		μsec	(note 6)
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		0.16	0.3	V	$I_C = 500\mu\text{A}$ $H = 20\text{mW}/\text{cm}^2$

Note 1: These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Note 2: These ratings give a maximum junction temperature of +85°C and junction to case thermal resistance of +300°C/W (derating factor of 3.33 mW/°C) and a junction to Ambient thermal resistance of +600°C/W (derating factor of 1.67 mW/°C)

Note 3: Measured at noted irradiance as emitted from a tungsten filament lamp at a colour temperature of 2854°K

Note 4: These are values obtained at noted irradiance as emitted from a GaAs source at 0.9 μ .

Note 5: Measured with radiation flux intensity of less than 0.1 $\mu\text{W}/\text{cm}^2$ over the spectrum from 100 to 1500 nm.

Note 6: Rise time is defined as the time required for I_{CE} to rise from 10% to 90% of peak value. Fall time is defined as the time required for I_{CE} to decrease from 90% to 10% of peak value. Test Conditions are: $I_{CE} = 4\text{mA}$, $V_{CE} = 5\text{V}$, $R_L = 100\text{ohm}$, GaAs source.

Note 7: No electrical connection to base lead.

Note 8: No electrical connection to emitter lead.



MICRO ELECTRONICS LTD. 美科有限公司

38 Hung To Road, Kwun Tong, Kowloon, Hong Kong. Cable: Microtron, Hong Kong. Telex: 43510 Micro HX.
 P.O. Box 49477, Kwun Tong. Tel: 3-430181-6 3-892363, 3-892423, 3-898221

FAX: 3-410321

TYPICAL ELECTRICAL CHARACTERISTICS

MAL100, MAL100A, MAL100B

