

DARLINGTON COUPLER

MT5750

GaAs INFRARED EMITTING DIODE & NPN SILICON PHOTO DARLINGTON

APPLICATIONS

- AC LINE/DIGITAL LOGIC ISOLATOR
- DIGITAL LOGIC/DIGITAL LOGIC ISOLATOR
- TELEPHONE LINE RECEIVER
- TWISTED PAIR LINE RECEIVER
- RELAY CONTACT MONITOR

The MT5750 consists of a gallium arsenide infrared emitting diode coupled with a silicon photo darlington in a dual in-line package.

FEATURES

- Small package size and low cost.
- Fast switching speeds: 200 μ s.
- High DC current transfer ratio: 200% min.
- High isolation resistance: 10¹¹ Ω .
- High isolation voltage: 2500 V_{RMS}.

MAXIMUM RATINGS (T_a = 25°C)

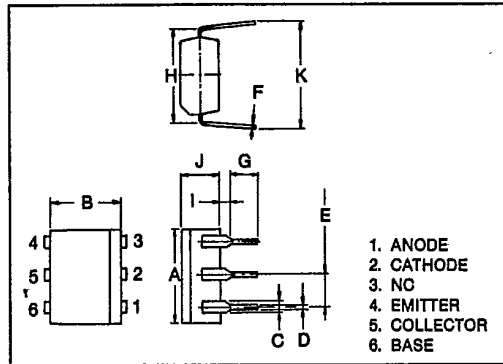
CHARACTERISTIC	SYMBOL	RATING	UNIT
Forward Current	I _F	60	mA
Forward Current Derating	$\Delta I_F/^\circ\text{C}$	0.7*	mA/°C
Peak Forward Current (Note)	I _{FP}	1	A
Power Dissipation	P _D	100	mW
Power Dissipation Derating	$\Delta P_D/^\circ\text{C}$	1.00*	mW/°C
Reverse Voltage	V _R	5	V
Collector-Emitter Voltage	BV _{CEO}	35	V
Collector-Base Voltage	BV _{CBO}	60	V
Emitter-Collector Voltage	BV _{ECO}	7	V
Collector Current	I _C	50	mA
Power Dissipation	P _C	150	mW
Power Dissipation Derating	$\Delta P_C/^\circ\text{C}$	-1.5*	mW/°C
Storage Temperature Range	T _{stg}	-55~150	°C
Operating Temperature Range	T _{opr}	-55~100	°C
Lead Soldering Temperature (at 10 sec.)	T _{sold}	260	°C
Total Package Power Dissipation	P _T	250	mW
Total Package Power Dissipation Derating	$\Delta P_T/^\circ\text{C}$	-2.5*	mW/°C

Note: Pulse width = 100 μ s, F = 100Hz

*Above 25°C ambient.

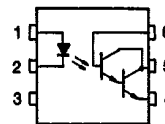
A - LED B - PHOTO-DARLINGTON C - COUPLED

T-41-85



SYMBOL	INCHES	MM
A	0.280 $\pm$ 0.010	7.12 $\pm$ 0.25
B	0.252	6.40
C	0.020	0.50
D	0.047	1.20
E	0.1 TYP	2.54 TYP
F	0.010	0.25
G	0.100 MIN	2.50 MIN
H	0.300	7.62
I	0.031	0.80
J	0.144	3.65
K	0.309 ~ 3.465	7.85 ~ 8.80

PIN CONFIGURATIONS
(TOP VIEW)



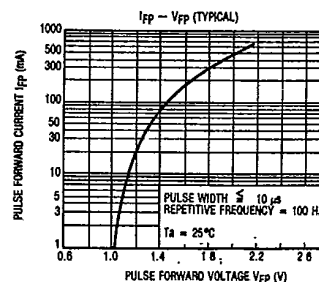
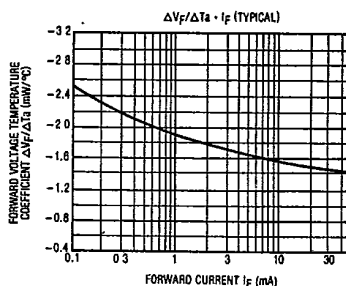
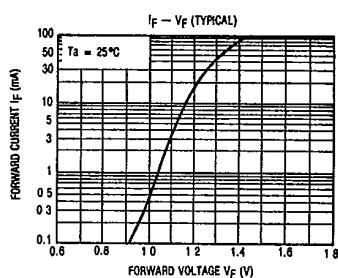
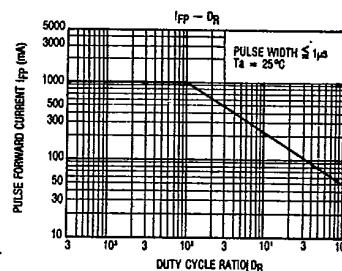
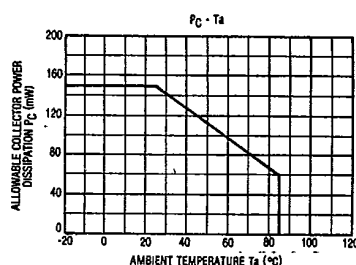
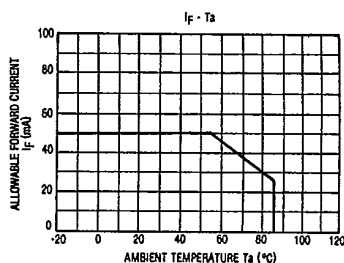
DARLINGTON COUPLER

OPTO-ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

T-41-85

	CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
A	Forward Voltage	V_F	$I_F = 10\text{mA}$	—	1.15	1.5	V
	Reverse Current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_D	$V = 0, f = 1\text{MHz}$	—	30	—	pF
B	DC Forward Current Gain	h_{FE}	$V_{CE} = 5, I_C = 0.5\text{mA}$	—	10K	—	—
	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_F = 0$	35	—	—	V
	Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_F = 0$	35	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\mu\text{A}, I_F = 0$	7	—	—	V
	Collector Dark Current	I_{CEO}	$V_{CE} = 10\text{V}, I_F = 0$	—	1.0	100	nA
C	Current Transfer Ratio	I_C/I_F	$V_{CE} = 1\text{V}, I_F = 1\text{mA}$	200	—	—	%
	Saturation Voltage	$V_{CE(sat)}$	$I_F = 1\text{mA}, I_C = 1\text{mA}$	—	—	1.0	V
	Turn On Time	t_{on}	$I_C = 10\text{mA}, V_{CE} = 10\text{V}, R_L = 100\Omega$	—	50	—	μs
	Turn Off Time	t_{off}					
	Capacitance Input to Output	C_S	$V = 0, f = 1\text{MHz}$	—	0.8	—	pF
	Isolation Resistance	R_S	$V = 500\text{V}$	—	10^{11}	—	Ω
	Isolation Voltage	BV_S	AC 1 Minute	3535	—	—	V_{peak}
				2500	—	—	V_{RMS}

A - LED B - PHOTO-DARLINGTON C - COUPLED



DARLINGTON COUPLER

T-41-85

