

DARLINGTON COUPLER

T.41-85

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 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}.

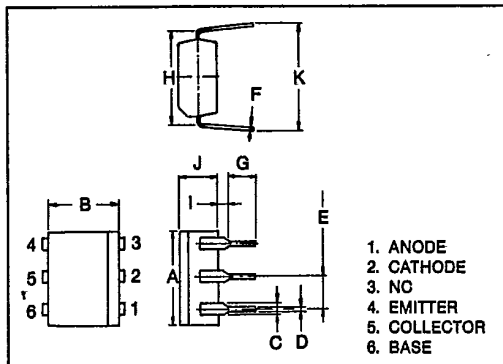
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Forward Current	I _F	60	mA
Forward Current Derating	$\Delta I_F / ^\circ C$	0.7*	mA/ $^\circ C$
Peak Forward Current (Note)	I _{FP}	1	A
Power Dissipation	P _D	100	mW
Power Dissipation Derating	$\Delta P_D / ^\circ C$	1.00*	mW/ $^\circ C$
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	$\Delta P_C / ^\circ C$	-1.5*	mW/ $^\circ C$
Storage Temperature Range	T _{stg}	-55 ~ 150	$^\circ C$
Operating Temperature Range	T _{opr}	-55 ~ 100	$^\circ C$
Lead Soldering Temperature (at 10 sec.)	T _{sold}	260	$^\circ C$
Total Package Power Dissipation	P _T	250	mW
Total Package Power Dissipation Derating	$\Delta P_T / ^\circ C$	-2.5*	mW/ $^\circ C$

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

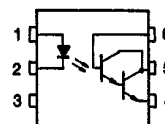
*Above 25 $^\circ C$ ambient.

A - LED B - PHOTO-DARLINGTON C - COUPLED



SYMBOL	INCHES	MM
A	0.280 ± 0.010	7.12 ± 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)



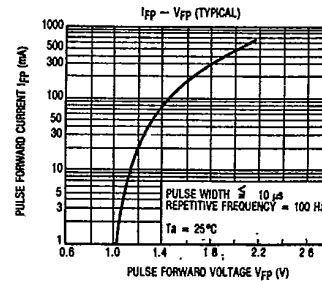
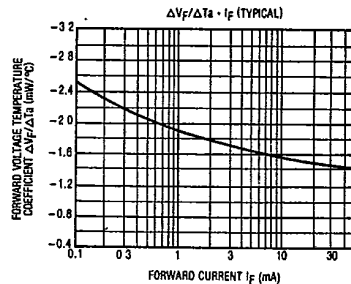
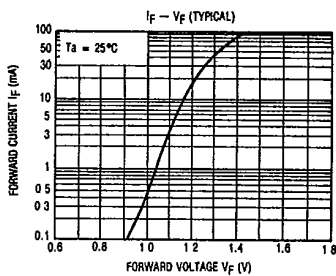
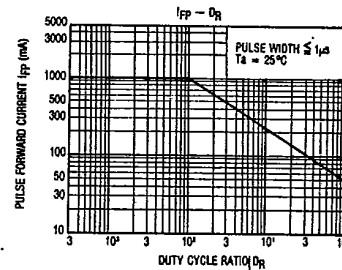
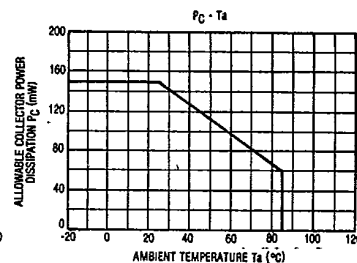
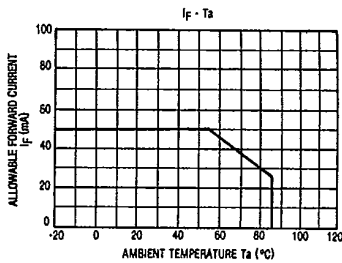
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OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Voltage	V _F	I _F = 10mA	—	1.15	1.5	V
Reverse Current	I _R	V _R = 5V	—	—	10	μA
Capacitance	C _D	V = 0, f = 1MHz	—	30	—	pF
DC Forward Current Gain	h _{FE}	V _{CE} = 5, I _C = 0.5mA	—	10K	—	—
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	I _C = 1mA, I _F = 0	35	—	—	V
Collector-Base Breakdown Voltage	V _{(BR)CBO}	I _C = 100μA, I _F = 0	35	—	—	V
Emitter-Collector Breakdown Voltage	V _{(BR)ECO}	I _E = 100μA, I _F = 0	7	—	—	V
Collector Dark Current	I _{CEO}	V _{CE} = 10V, I _F = 0	—	1.0	100	nA
Current Transfer Ratio	I _C /I _F	V _{CE} = 1V, I _F = 1mA	200	—	—	%
Saturation Voltage	V _{CE(sat)}	I _F = 1mA, I _C = 1mA	—	—	1.0	V
Turn On Time	t _{on}	I _C = 10mA, V _{CE} = 10V, R _L = 100Ω	—	50	—	μs
Turn Off Time	t _{off}					
Capacitance Input to Output	C _S	V = 0, f = 1MHz	—	0.8	—	pF
Isolation Resistance	R _S	V = 500V	—	10 ¹¹	—	Ω
Isolation Voltage	BV _S	AC 1 Minute	3535	—	—	V _{peak}
			2500	—	—	V _{RMS}

A - LED B - PHOTO-DARLINGTON C - COUPLED



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