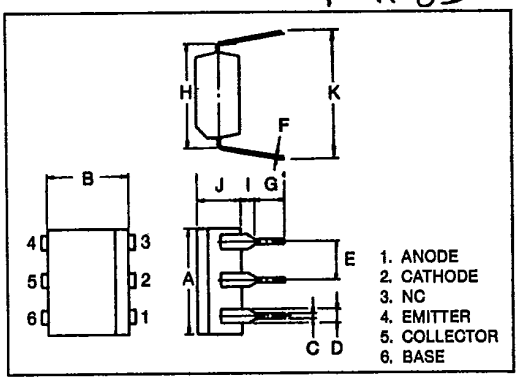
TRANSISTOR COUPLER

T-41-83

MT5350
GaAs INFRARED EMITTING DIODE & NPN SILICON PHOTO TRANSISTOR



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

APPLICATIONS

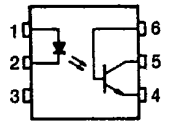
- AC LINE/DIGITAL LOGIC ISOLATOR
- DIGITAL LOGIC/DIGITAL LOGIC ISOLATOR
- TELEPHONE LINE RECEIVER
- TWISTED PAIR LINE RECEIVER
- HIGH FREQUENCY POWER SUPPLY FEEDBACK CONTROL
- RELAY CONTACT MONITOR

The MT5350 consists of a gallium arsenide infrared emitting diode coupled with a silicon photo transistor in a dual in-line package.

FEATURES

- Small package size and low cost.
- Fast switching speeds: 5μs.
- High DC current transfer ratio: *50% Min.
  *CTR Rank (@ I_F = 10mA, V_{CE} = 10V).
  Standard Type: 50% Min.
  Selected Rank GB: 100% Min.
  Selected Rank BL: 200% Min.
- High isolation resistance: $10^{11}\Omega$.
- High isolation voltage: 2500 V_{RMS}.
- UL recognized.

PIN CONFIGURATIONS
(TOP VIEW)



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MAXIMUM RATINGS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	RATING	UNIT
A	Forward Current	I_F	60	mA
	Forward Current Derating	ΔI_F/°C	0.8*	mA/°C
	Peak Forward Current (Note)	I_{PF}	3	A
	Power Dissipation	P_D	100	mW
	Power Dissipation Derating	ΔP_D/°C	1.33*	mW/°C
	Reverse Voltage	V_R	3	V
B	Collector-Emitter Voltage	BV_{CEO}	35	V
	Collector-Base Voltage	BV_{CBO}	70	V
	Emitter-Collector Voltage	BV_{ECO}	7	V
	Collector Current	I_C	100	mA
	Power Dissipation	P_C	150	mW
	Power Dissipation Derating	ΔP_C/°C	2.0*	mW/°C
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 Dissipation	P_T	200	mW
	Total Package Power Dissipation Derating	ΔP_T/°C	2.6*	mW/°C

Note: Pulse Width 1μs, 300pps. *Above 25°C ambient.

OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
A	Forward Voltage	V_F	I_F=10mA	1.0	1.15	1.3	V
	Reverse Current	I_R	V_R=3V	—	—	100	μA
	Capacitance	C_D	V=0, f=1MHz	—	30	—	pF
B	DC Forward Current Gain	h_{FE}	V_{CE}=5, I_C=500μA	100	200	—	—
	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	70	—	—	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	50	nA
	Collector Dark Current	I_{CBO}	V_{CB}=10V, I_F=0	—	0.1	20	nA
	Collector-Emitter Capacitance	C_{CE}	V=0, f=1MHz	—	10	—	pF
C	Current Transfer Ratio	I_C/I_F GB	I_F=10mA, V_{CE}=10V	50	—	—	%
		I_C/I_F BL		100			
				200			
	Saturation Voltage	$V_{CE(SAT)}$	I_F=10mA, I_C=2mA	—	0.1	0.3	V
	Capacitance Input to Output	C_S	V=0, F=1MHz	—	0.8	—	pF
	Isolation Resistance	R_S	V=500V	—	10^{11}	—	Ω
	AC Isolation Voltage	BV_S	AC 1 minute	2500	—	—	V_{RMS}
	Peak Isolation Voltage	BV_S	Peak	3550	—	—	V
	Rise/Fall Time	t_r/t_f	V_{CE}=10V, I_C=2mA, R_L=100Ω	—	5	—	μs
	Rise/Fall Time Photo Diode	t_r/t_f	V_{CB}=10V, I_{CB}=50μA, R_L=100Ω	—	200	—	ns
	Turn-on Time	t_{on}	V_{CC}=5V, R_L=1.9kΩ	—	2	—	μs
	Storage Time	t_s	I_F=16mA	—	12	—	
	Turn-off Time	t_{off}	R_{BE}=220kΩ	—	20	—	

A - LED B - PHOTO-TRANSISTOR C - COUPLED

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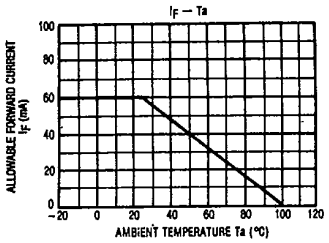

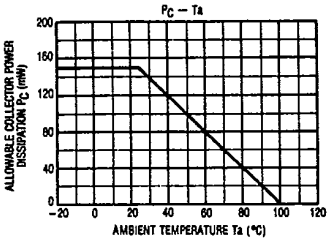

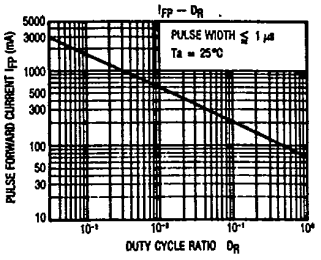

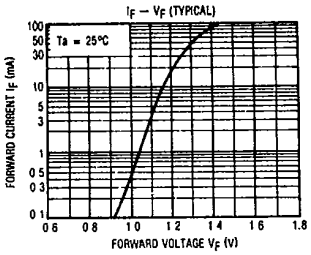

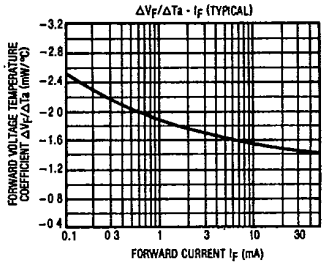

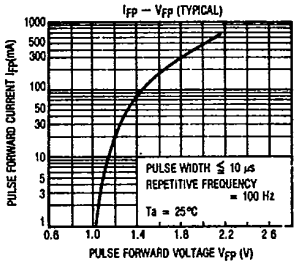

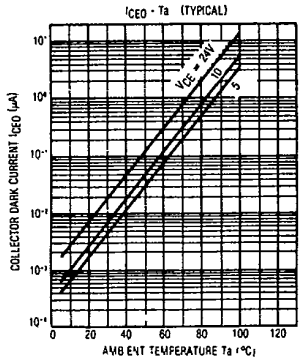

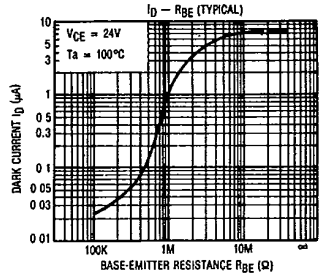

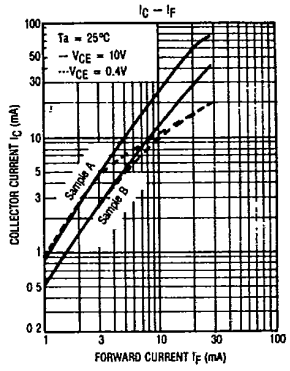

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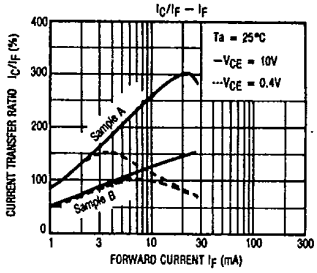
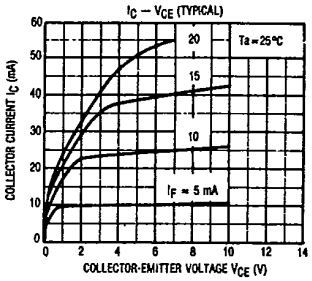
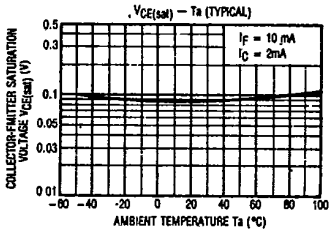
$I_C/I_F - I_F$



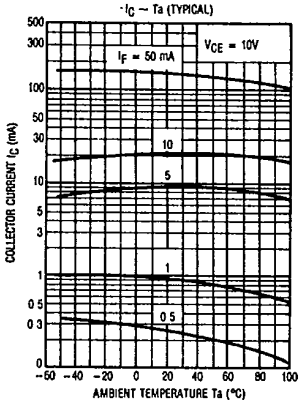
$I_C - V_{CE}$ (TYPICAL)



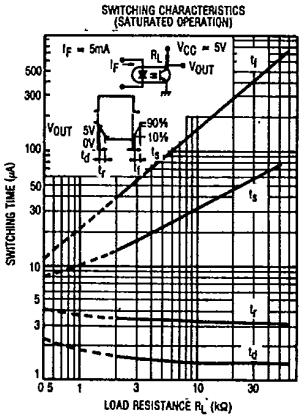
$V_{CE(sat)} - Ta$ (TYPICAL)



$I_C - Ta$ (TYPICAL)



SWITCHING CHARACTERISTICS (SATURATED OPERATION)



R_{BE} — SWITCHING CHARACTERISTICS (SATURATED OPERATION)