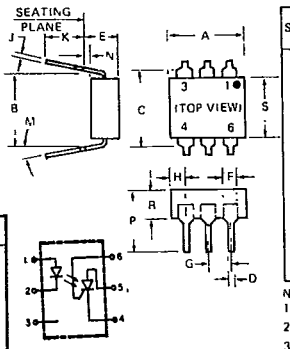
Photon Coupled Isolator MCS21, MCS2401

GaAs Infrared Emitting Diode & Light Activated SCR

The GE Solid State MCS21 and MCS2401 consist of a gallium arsenide, infrared emitting diode coupled with a light activated silicon controlled rectifier in a dual-in-line package. These devices are also available in Surface-Mount packaging.

Ⓤ Covered under U.L. component recognition program, reference file E51868



SYMBOL	MILLIMETERS MIN	MILLIMETERS MAX.	INCHES MIN.	INCHES MAX.	NOTES
A	8 38	8 89	330	350	
B	7 62 REF		300 REF		1
C	–	8 64	–	340	2
D	406	508	016	020	
E	–	5 08	–	200	3
F	1 01	1 78	040	070	
G	2 28	2 80	090	110	
H	–	2 16	–	085	4
J	203	305	008	012	
K	2 54	–	100	–	
M	–	15	–	15	
N	381	–	015	–	
P	–	9 53	–	375	
R	2 92	3 43	115	135	
S	6 10	6 86	240	270	

NOTES
1 INSTALLED POSITION LEAD CENTERS
2 OVERALL INSTALLED DIMENSION
3 THESE MEASUREMENTS ARE MADE FROM THE SEATING PLANE 4 FOUR PLACES

absolute maximum ratings

INFRARED EMITTING DIODE

Power Dissipation	*100	milliwatts
Forward Current (Continous)	60	milliamps
Forward Current (Peak) (100μsec 1% duty cycle)	1	ampere
Reverse Voltage	3	volts

*Derate 1.33mW/°C above 25°C ambient.

PHOTO-SCR

Off-State and Reverse Voltage	MCS21	200	volts
	MCS2401	400	volts
Peak Reverse Gate Voltage		6	volts
Direct On-State Current		300	milliamps
Surge (non-rep) On-State Current		10	amps
Peak Gate Current		10	milliamps
Output Power Dissipation		**400	milliwatts

**Derate 5.3mW/°C above 25°C ambient.

TOTAL DEVICE

Storage Temperature Range — 55°C to 150°C
Operating Temperature Range — 55°C to 100°C
Soldering Temperature (1/16" from case, 10 seconds) 260°C
Total Device Dissipation 450 milliwatts
Linear Derating Factor (above 25°C) 6.0mW/°C
Surge Isolation Voltage (Input to Output).
4000 $V_{(peak)}$ 3000 $V_{(RMS)}$
Steady-State Isolation Voltage (Input to Output).
3500 $V_{(peak)}$ 2500 $V_{(RMS)}$

individual electrical characteristics (25°C) (unless otherwise specified)

INFRARED EMITTING DIODE	TYP.	MAX.	UNITS
Forward Voltage V_F (I_F = 20mA)	1.1	1.5	V
Reverse Current I_R (V_R = 3V)	—	10	μA
Capacitance (V = 0, f = 1MHz)	50	—	pF

PHOTO-SCR		MIN.	MAX.	UNITS
Peak Off-State Voltage — V_{DM}	MCS21	200	—	V
(R_{GK} = 10KΩ, T_A = 100°C, I_D = 150μA)	MCS2401	400	—	V
Peak Reverse Voltage — V_{RM}	MCS21	200	—	V
(T_A = 100°C, I_R = 150μA)	MCS2401	400	—	V
On-State Voltage — V_T (I_T = 100mA)		—	1.3	V
Off-State Current — I_D (V_D = 200V, I_F = 0, R_{GK} = 27K)	MCS21	—	2	μA
Off-State Current — I_D (V_D = 400V, I_F = 0, R_{GK} = 27K)	MCS2401	—	2	μA
Reverse Current — I_R (V_R = 200V, I_F = 0)	MCS21	—	2	μA
Reverse Current — I_R (V_R = 400V, I_F = 0)	MCS2401	—	2	μA
Holding Current — I_H (V_{FX} = 50V, R_{GK} = 27KΩ)		10	500	μA

coupled electrical characteristics (25°C)

			MIN.	MAX.	UNITS
Input Current to Trigger	V_{AK}=50V, R_{GK}=10KΩ	I_{FT}		20	milliamps
	V_{AK} = 100V, R_{GK} = 27KΩ	I_{FT}	.5	11	milliamps
Isolation Resistance (Input to Output)	V_{io} = 500V_{DC}	r_{io}	100	–	gigaohms
Turn-On Time — V_{AK} = 50V, I_F = 30mA, R_{GK} = 10KΩ, R_L = 200Ω		t_{on}	—	50	microseconds
Coupled dv/dt, Input to Output			500	–	volts/microsec.
Input to Output Capacitance (Input to Output Voltage = 0, f = 1MHz)			—	2	picofarads

VDE Approved to 0883/6.80 0110b Certificate # 35025

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TYPICAL CHARACTERISTICS

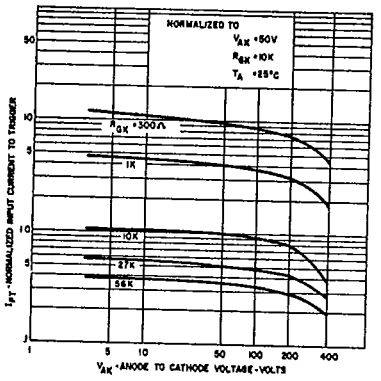

FIGURE 1. INPUT CURRENT TO TRIGGER VS. ANODE-CATHODE VOLTAGE

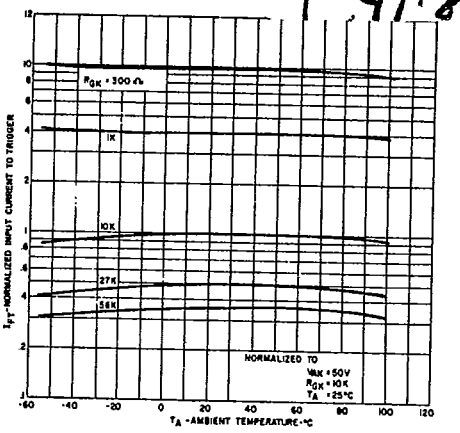

FIGURE 2. INPUT CURRENT TO TRIGGER VS. TEMPERATURE

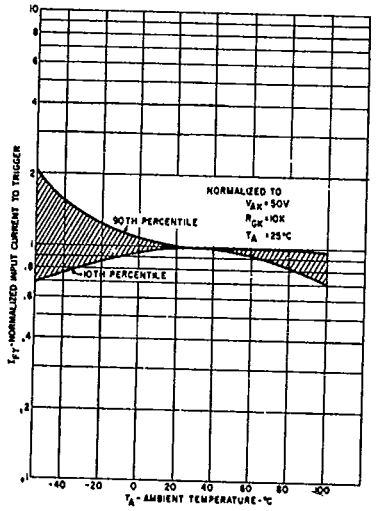

FIGURE 3. INPUT CURRENT TO TRIGGER DISTRIBUTION VS. TEMPERATURE

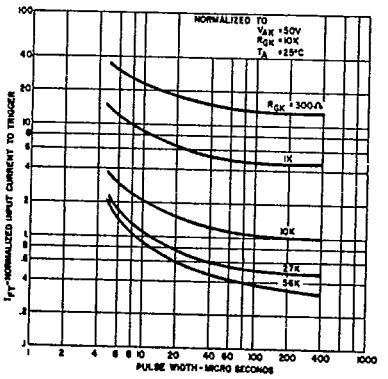

FIGURE 4. INPUT CURRENT TO TRIGGER VS. PULSE WIDTH

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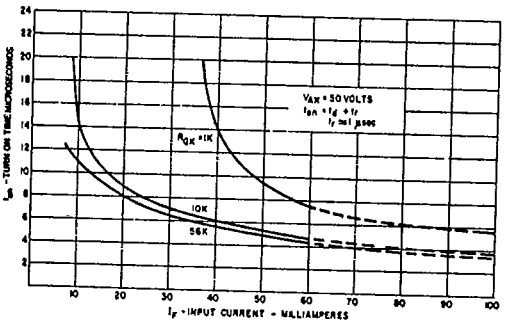

FIGURE 5. TURN-ON TIME VS. INPUT CURRENT

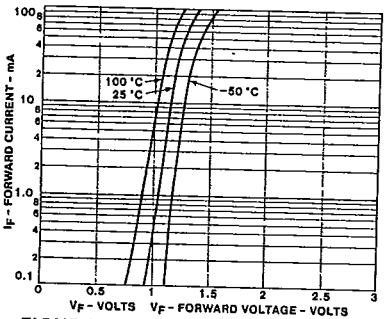

FIGURE 6. INPUT CHARACTERISTICS I_F VS. V_F

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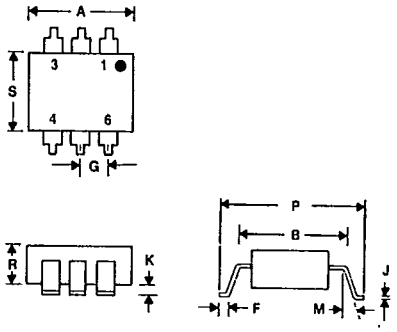
Surface-Mount Optoisolators



Surface-mount packaging for the entire 6-pin DIP opto-isolator line!

Add the "SMA" or "SMB" suffix to any 6-pin optoisolator part number when ordering.

DIMENSIONAL OUTLINE NO. 298
All Surface-Mount Types

SMB (Standard)
Surface-Mount Package

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	0.330	0.350	8.38	8.89	
B	0.330 REF		8.38 REF		
F	0.020	0.040	0.508	1.02	
J	0.008	0.012	0.203	0.305	
K	0.0040	0.0098	0.102	0.249	
M	—	15°	—	15°	
P	0.375	0.395	9.53	10.03	
R	0.115	0.135	2.92	3.43	
S	0.240	0.270	6.10	6.86	
Coplanarity	0	0.002	0	0.051	1

92CS-42862

1. Coplanarity is the distance from a plane, defined by the end of the three longest legs to the end of the shortest leg.

SMA (Low Profile)
Surface-Mount Package

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	0.330	0.350	8.38	8.89	
B	0.330 REF		8.38 REF		
F	0.020	0.040	0.508	1.02	
J	0.008	0.012	0.203	0.305	
K	0.0005	0.0040	0.013	0.102	
M	—	15°	—	15°	
P	0.373	0.393	9.47	9.98	
R	0.115	0.135	2.92	3.43	
S	0.240	0.270	6.10	6.86	
Coplanarity	0	0.002	0	0.051	1

92CS-42861

1. Coplanarity is the distance from a plane, defined by the end of the three longest legs to the end of the shortest leg.