

# 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

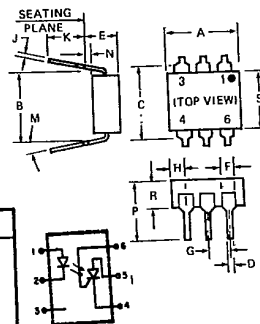
### absolute maximum ratings

INFRARED EMITTING DIODE	
Power Dissipation	*100 milliwatts
Forward Current (Continuous)	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.



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	8.38	8.89	.330	.350	
B	7.62 REF	8.64	.300 REF	.340	1
C	-	5.08	.200	.200	2
D	.406	-	.016	-	
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	-	115	
S	-	6.10	-	270	

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

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 <sup>(peak)</sup> 3000 V <sup>(RMS)</sup>
Steady-State Isolation Voltage (Input to Output)	3500 V <sup>(peak)</sup> 2500V <sup>(RMS)</sup>

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

INFRARED EMITTING DIODE	TYP.	MAX.	UNITS	PHOTO-SCR	MIN.	MAX.	UNITS
Forward Voltage $V_F$ ( $I_F = 20mA$ )	1.1	1.5	V	Peak Off-State Voltage — $V_{DM}$ $R_{GK} = 10K\Omega, T_A = 100^\circ C, I_D = 150\mu A$	MCS21 200 MCS2401 400	—	V
Reverse Current $I_R$ ( $V_R = 3V$ )	—	10	μA	Peak Reverse Voltage — $V_{RM}$ ( $T_A = 100^\circ C, I_R = 150\mu A$ )	MCS21 200 MCS2401 400	—	V
Capacitance ( $V = 0, f = 1MHz$ )	50	—	pF	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 — $I_H$ ( $V_{FX} = 50V, R_{GK} = 27K\Omega$ )		10	500 μA

### coupled electrical characteristics (25°C)

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

VDE Approved to 0883/6.80 0110b Certificate # 35025

TYPICAL CHARACTERISTICS

T-41.87

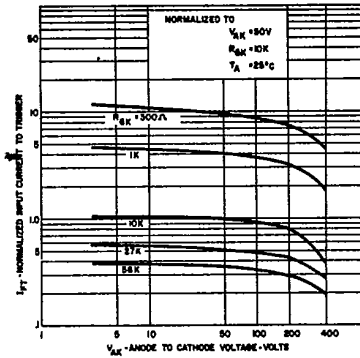


FIGURE 1. INPUT CURRENT TO TRIGGER VS. ANODE-CATHODE VOLTAGE

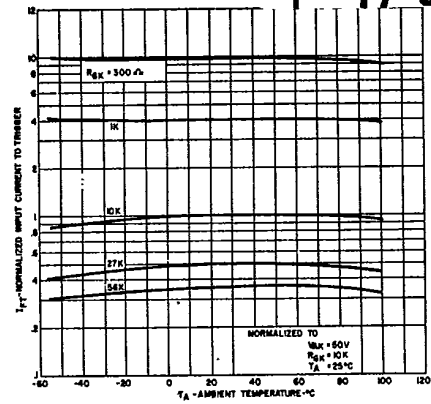


FIGURE 2. INPUT CURRENT TO TRIGGER VS. TEMPERATURE

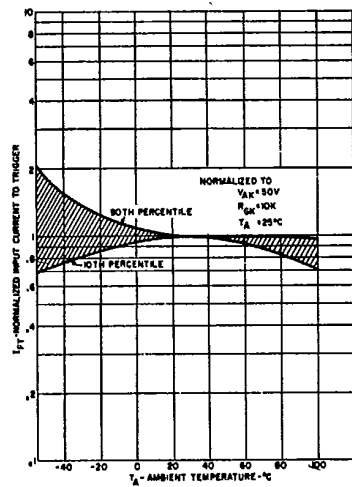


FIGURE 3. INPUT CURRENT TO TRIGGER DISTRIBUTION VS. TEMPERATURE

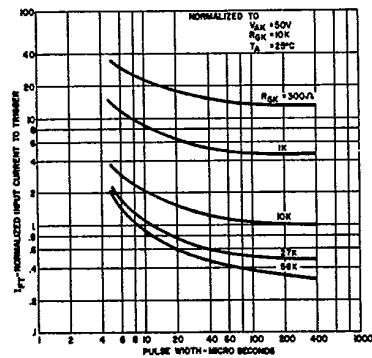


FIGURE 4. INPUT CURRENT TO TRIGGER VS. PULSE WIDTH

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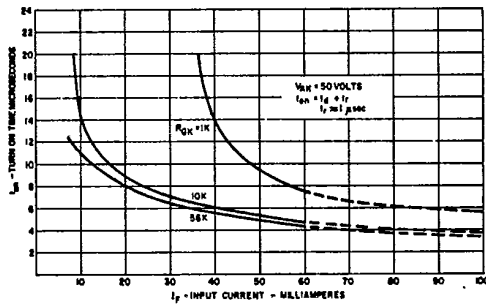


FIGURE 5. TURN-ON TIME VS. INPUT CURRENT

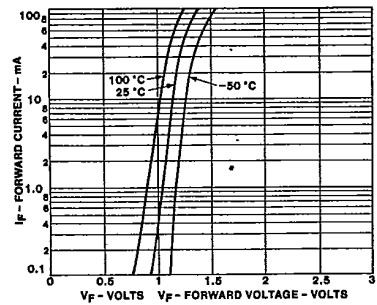


FIGURE 6. INPUT CHARACTERISTICS I<sub>F</sub> VS. V<sub>F</sub>