MOC5007, MOC5008, MOC5009

MICROPROCESSOR COMPATIBLE SCHMITT TRIGGER OPTICALLY COUPLED ISOLATOR

ISOCOM COMPONENTS

APPROVALS

- UL recognised, File No. E91231

DESCRIPTION

The MOC500_ series are optically coupled isolators consisting of a Gallium Arsenide infrared emitting diode and a Microprocessor Compatible Schmitt trigger output mounted in a standard 6 pin dual in line package.

FEATURES

- Options :-
  10mm lead spread - add G after part no.
  Surface mount - add SM after part no.
  Tape&reel - add SMT&R after part no.
- High data rate, 1MHz typical (NRZ)
- Microprocessor compatible drive
- Logic compatible output sinks 16 milliamperes at 0.4 volts maximum
- High Isolation Voltage (5.3kV$_{RMS}$,7.5kV$_{PK}$)
- High common mode rejection ratio
- Fast switching : t *rise*, t *fall* = 100nS typical
- Wide supply voltage capability, compatible with all popular logic systems
- Guaranteed On / Off threshold hysteresis

APPLICATIONS

- Logic to logic isolator
- Line receiver-eliminates noise and transient problems
- Programmable current level sensor
- AC to TTL conversion - square wave shaping
- Digital programming of power supplies
- Interfaces computers with peripherals

Dimensions in mm

Pin configuration:
- 1 — 6 V$_{CC}$
- 2 — 5 GROUND
- 3 — 4 V$_O$

OPTION SM SURFACE MOUNT	OPTION G
0.6, 0.1, 1.25, 0.75, 10.46, 9.86	7.62, 0.26, 10.16
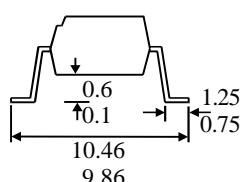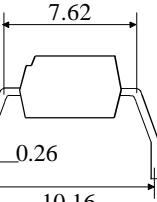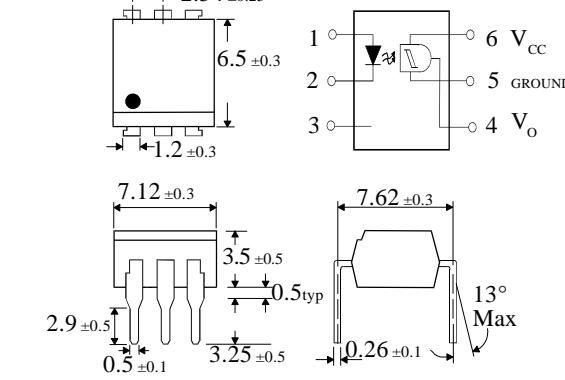
ABSOLUTE MAXIMUM RATINGS
(25°C unless otherwise specified)

|	
Storage Temperature	-40°C to +125°C
Operating Temperature	-25°C to +85°C
Lead Soldering Temperature (1/16 inch (1.6mm) from case for 10 secs)	260°C

INPUT DIODE

Forward Current, I$_F$	50mA
Peak forward current (Pulse width ≤ 100uS, Duty ratio=0.001)	1A
Reverse Voltage, V$_R$	6V
Power Dissipation (derate linearly 1.41mW / °C above 25°C)	70mW

OUTPUT DETECTOR

Output Voltage, V$_{cc}$	16V
Supply Voltage, V$_{OH}$	16V
Output current, I$_{OL}$	50mA
Power Dissipation (derate linearly 2mW / °C above 25°C)	150mW

POWER DISSIPATION

Total Power Dissipation (derate linearly 2.94mW/ °C above 25°C)	170mW

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless otherwise noted)

|	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION
Input	Forward Voltage (V_F)		0.75			V	I_F = 0.3mA
	Forward Voltage (V_F)				1.5	V	I_F = 10mA
	Reverse Current (I_R)				10	μA	V_R = 3V
	Capacitance (C_J)				100	pF	V = 0, f = 1MHz
Output	Operating Voltage Range (V_{CC})		3		15	V	
	Supply Current I_6 (off)			1	5	mA	I_F = 0mA, V_{CC} = 5V
	Output Current High (I_{OH})				100	μA	I_F= 0mA, V_{CC}= V_O=15V
Coupled	Supply Current I_6 (on)			1.6	5	mA	I_F = 10mA, V_{CC} = 5V
	Output Voltage, Low (V_{OL})				0.4	V	R_L = 270Ω, V_{CC} = 5V
	Turn-on Threshold Current I_F (on)						
	MOC5007				1.6	mA	R_L = 270Ω, V_{CC} = 5V
	MOC5008				4	mA	R_L = 270Ω, V_{CC} = 5V
	MOC5009				10	mA	R_L = 270Ω, V_{CC} = 5V
	Turn-off Threshold Current I_F (off)		0.3			mA	R_L = 270Ω, V_{CC} = 5V
	Hysteresis Ratio I_F (off) / I_F (on)		0.5		0.9		R_L = 270Ω, V_{CC} = 5V
	Input to Output Isolation Voltage V_{IS0}		5300			V_{RMS}	See note 1
			7500			V_{PK}	See note 1
	Turn-on Time	t_{on}		1.2	4	μs	R_E = 270Ω
	Fall Time	t_f		0.1		μs	V_{CC} = 5V
	Turn-off Time	t_{off}		1.2	4	μs	I_F = I_F (on)
	Rise Time	t_r		0.1		μs	

Note 1   Measured with input leads shorted together and output leads shorted together.
Note 2   Special Selections are available on request. Please consult the factory.

SWITCHING CHARACTERISTICS
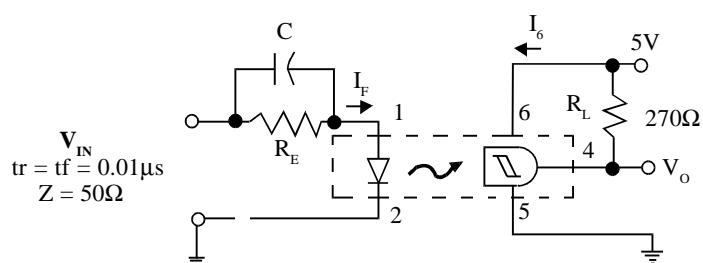

SWITCHING TEST CIRCUIT
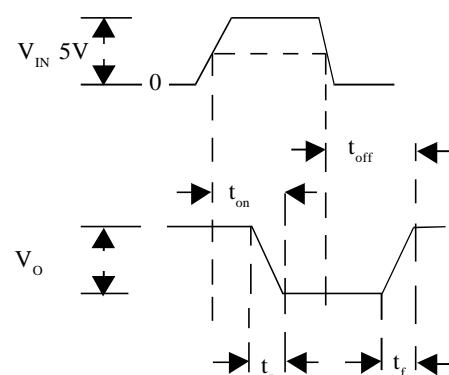
Transfer Characteristics

Output voltage V_O (V)

V_{OH}

I_F (off) I_F (on)

$R_L = 270\Omega$
$V_{CC} = 5V$
$T_A = 25°C$

V_{OL}

Input current I_F (mA)
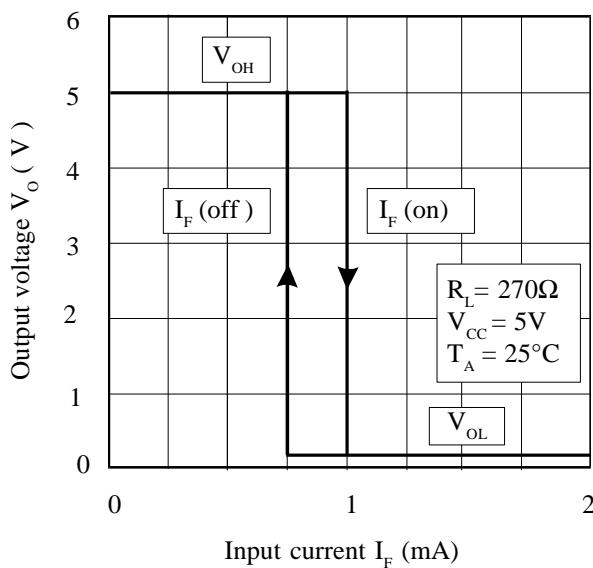
On Voltage vs. Load Current

Output voltage low V_{OL} (V)

$V_{CC} = 5V$
$T_A = 25°C$

Load current I_O (mA)
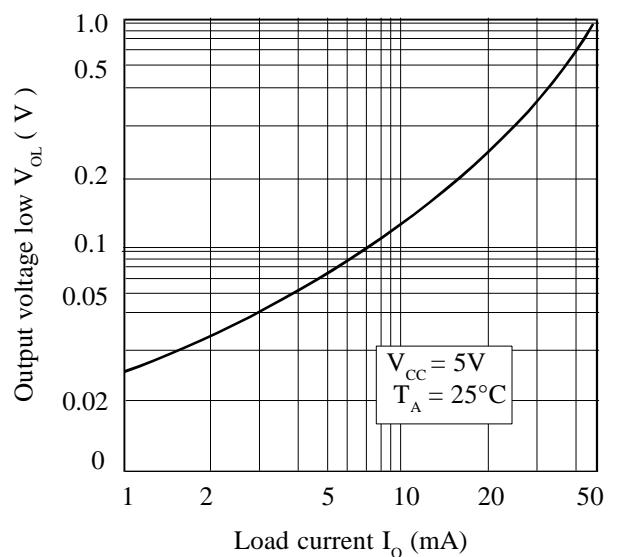
Threshold Current vs. Supply Voltage

Threshold current I_F (normalized)

Turn-on threshold

Turn-off threshold

I_F Normalized
to I_F(on) at
$V_{CC} = 5V$
$T_A = 25°C$

Supply voltage V_{CC} (V)
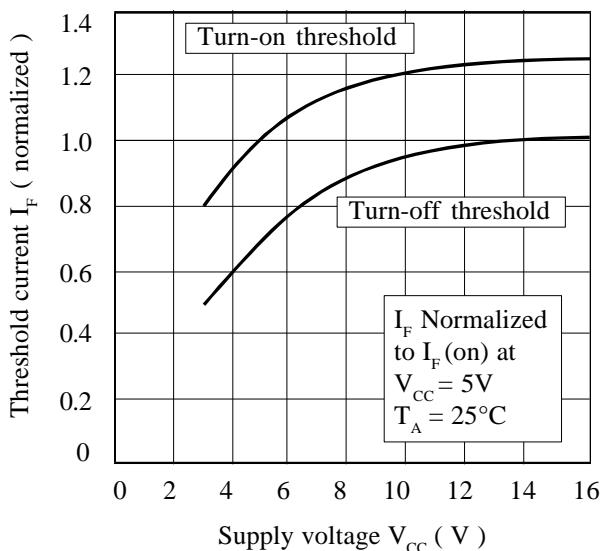
Forward Voltage vs. Forward Current

Forward current I_F (mA)

100°C   -55°C

25°C

Forward voltage V_F (V)
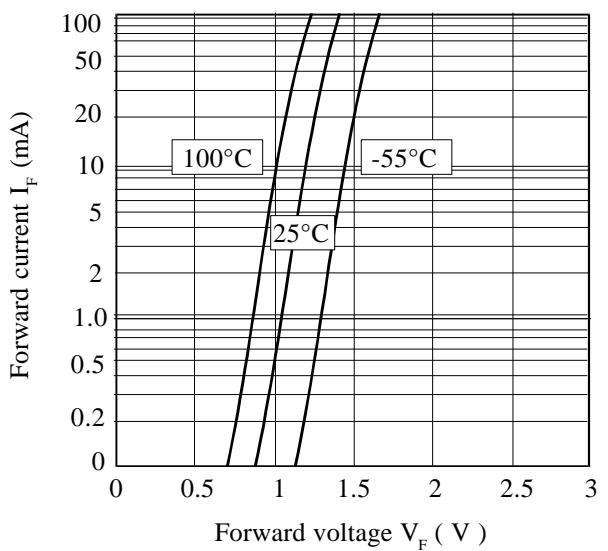
Threshold Current vs. Ambient Temperature

Threshold current $I_{F(on)}$ $I_{F(off)}$ (normalized)

Normalized to
$V_{CC} = 5V$
$T_A = 25°C$

Ambient temperature T_A (°C)
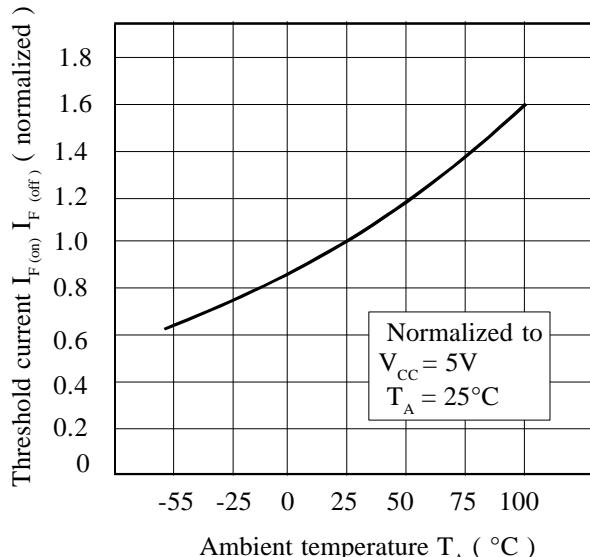
Supply Current vs. Supply Voltage

Supply Current I_C (mA)

$T_A = 25°C$

$I_F = 5mA$

$I_F = 0mA$

Supply voltage V_{CC} (V)