

DESCRIPTION

The IS06, IS25, IS40 and IS60 are Single Channel Solid State Relays (Photo MOSFET) each consists of an infrared emitting diode optically coupled to a high voltage output detector. The detector consists of a Photo Voltaic Diode Array and high voltage output MOSFETs. The Solid State Relay can be configured to have AC/DC or DC only operation.

This Single Channel Output configuration is equivalent to 1 Form A of Electro-mechanical Relay.

FEATURES

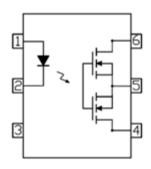
- Normally Open Single Pole Single Throw Relay
- High Output Voltages 60V to 600V
- Low ON Resistance
- Low Operating Current
- High AC Isolation Voltage 5000V_{RMS}
- Wide Operating Temperature Range
- -40°C to 85°C
- Pb Free and RoHS Compliant
- Safety Approvals Pending

APPLICATIONS

- Industrial Controls
- Telephone/Exchange Equipment
- Measurement Equipment
- FA/OA Equipment
- Security System
- Reed Relay Replacement

ORDER INFORMATION

- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount,
- Add SMT&R after PN for Surface Mount Tape & Reel



ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C)

Input Diode

Forward Current	50mA
Reverse Voltage	5V
Forward Peak Current	1A
(f=100Hz, Duty Cycle = 0.1%)	
Power dissipation	75mW

Output

	IS06	IS25	IS40	IS60
Output	60	250	400	600
Breakdown Voltag	е			
$V_{L}(V)$				
Load Current I _L				
Continuous (mA)	550	180	120	50
Pulse (A)	1.2	0.5	0.3	0.15
(100ms, 1 shot,				
$V_L = DC$)				
Power Dissipation			500m	W

Total Package

Isolation Voltage (R.H. = 40% - 60%, 1 min)	5000 _{RMS}
Total Power Dissipation	550mW
Operating Temperature	-40 to 85 °C
Storage Temperature	-40 to 125 °C
Lead Soldering Temperature (10s)	260°C

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Truth Table

Input	Output
ON	CLOSE
OFF	OPEN

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Forward Voltage	V_{F}	$I_F = 10 \text{mA}$		1.18	1.5	V
Reverse Current	I_R	$V_R = 5V$			1	μΑ

OUTPUT

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Off State Leakage Current	I_{leak}	$I_F = 0$ mA, $V_L = Max$			1	μA
On Resistance		$I_F = 5 \text{mA}, I_L = \text{Max}, t = 1 \text{s}$				Ω
	$R_{d(ON)}A$	IS06		0.75	2.5	
		IS25		6.5	15	
		IS40		20	30	
		IS60		42	70	
	$R_{d(ON)}B$	IS06		0.4	1	
		IS25		3	5	
		IS40		14	20	
		IS60		30	50	
	$R_{d(ON)}C$	IS06		0.2	0.5	
		IS25		1.5	3	
		IS40		7	15	
		IS60		15	30	

Note : R $_{d(ON)}$ A, R $_{d(ON)}$ B and R $_{d(ON)}$ C are specified under corresponding Connection Types.



ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

OUTPUT

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Output Capacitance	C _{out}	$V_L = 0V$, $f = 1MHz$				pF
		IS06		85		
		IS25		60		
		IS40		45		
		IS60		30		

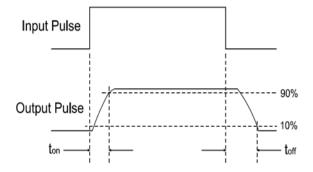
COUPLED

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
LED Turn On Current	$I_{F(on)}$	$I_L = Max$		1.5	3	mA
LED Turn Off Current	$I_{F(off)}$	$I_L = Max$	0.4	1.5		mA
Turn On Time	Ton	$I_F = 10 \text{mA}, I_L = \text{Max}, R_L = 200\Omega$				ms
		IS06		1.3	3	
		IS25		1	3	
		IS40		0.35	3	
		IS60		1	3	
Turn Off Time	$T_{ m off}$	$I_F = 10 \text{mA}, I_L = \text{Max}, R_L = 200\Omega$				ms
		IS06		0.1	0.5	
		IS25		0.1	0.5	
		IS40		0.1	0.5	
		IS60		0.1	0.5	
Isolation Resistance	$R_{\text{I-O}}$	$V_{\text{I-O}} = 500 \text{VDC}$	5 x 10 ¹⁰			Ω
Isolation Capacitance	$C_{\text{I-O}}$	V = 0V, $f = 1MHz$	_	1.5		pF

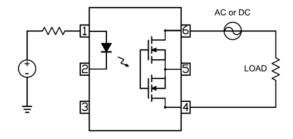


ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

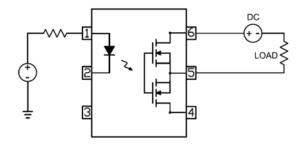
Turn on / Turn off Time

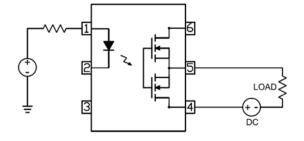


Connection A

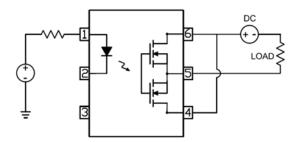


Connection B





Connection C





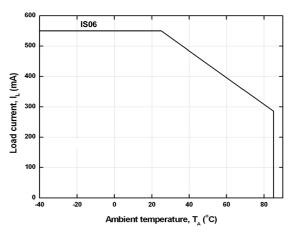


Fig 1a Load Current vs Ambient Temperature

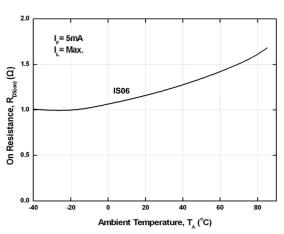


Fig 2a On Resistance vs Ambient Temperature

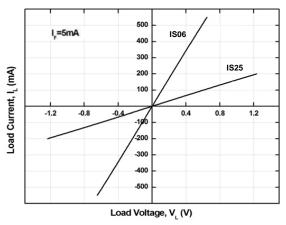


Fig 3a Load Current vs Load Voltage

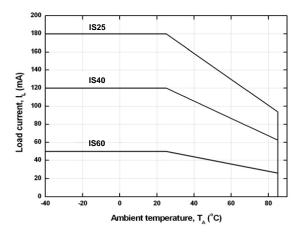


Fig 1b Load Current vs Ambient Temperature

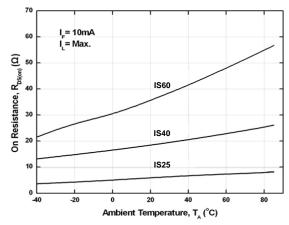


Fig 2b On Resistance vs Ambient Temperature

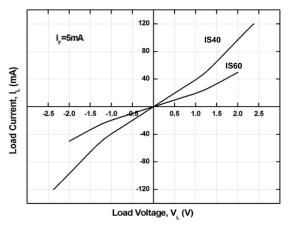


Fig 3b Load Current vs Load Voltage



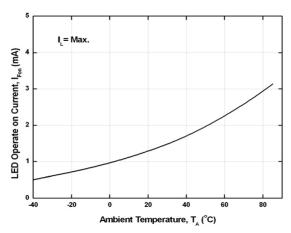


Fig 4 LED Turn On Current vs T_A

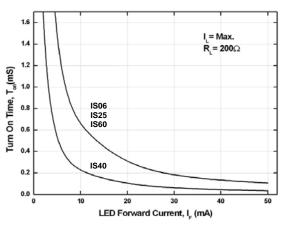


Fig 6 Turn On Time vs LED Forward Current

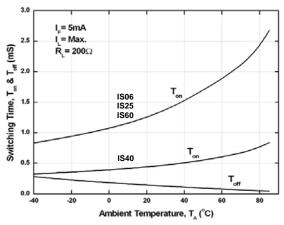


Fig 8 Switching Time vs Ambient Temperature

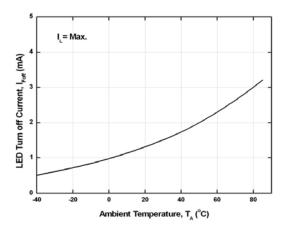


Fig 5 LED Turn Off Current vs T_A

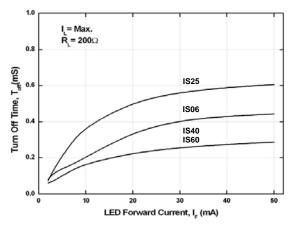


Fig 7 Turn Off Time vs LED Forward Current

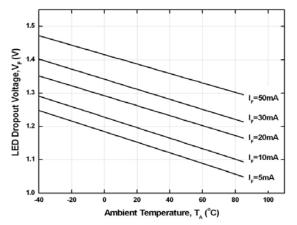


Fig 9 LED Dropout Voltage vs T_A



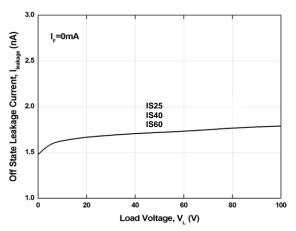


Fig 10 Off State Leakage Current vs Load Voltage

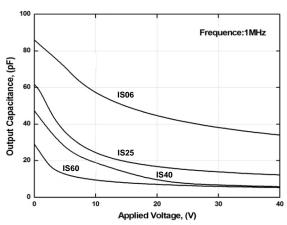
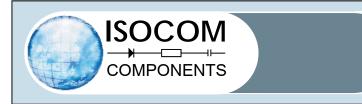


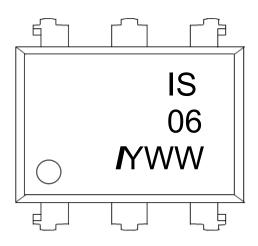
Fig 11 Output Capacitance vs Applied Voltage



ORDER INFORMATION

IS06, IS25, IS40, IS60					
After PN	PN	Description	Packing quantity		
None	IS06, IS25, IS40, IS60	Standard DIP6	65 pcs per tube		
G	IS06G, IS25G, IS40G, IS60G	10mm Lead Spacing	65 pcs per tube		
SM	IS06SM, IS25SM, IS40SM, IS60SM	Surface Mount	65 pcs per tube		
SMT&R	IS06SMT&R, IS25SMT&R, IS40SMT&R, IS60SMT&R	Surface Mount Tape & Reel	1000 pcs per reel		

DEVICE MARKING



IS06 denotes Device Part Number (IS06 is used as example)

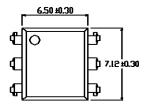
denotes Isocom

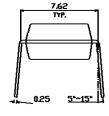
Y denotes 1 digit Year code WW denotes 2 digit Week code

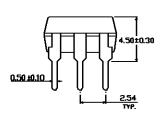


PACKAGE DIMENSIONS (mm)

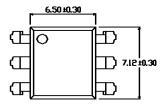


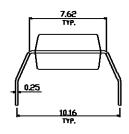


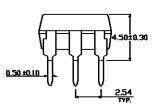




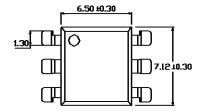
G Form

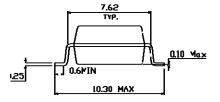


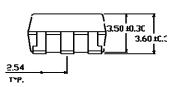




SMD

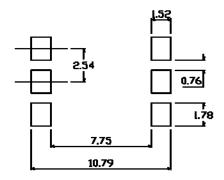




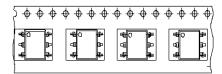




RECOMMENDED PAD LAYOUT FOR SMD (mm)

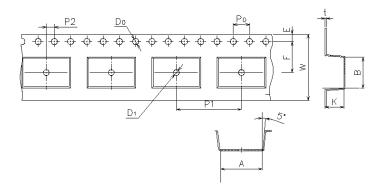


TAPE AND REEL PACKAGING



Direction of feed from reel

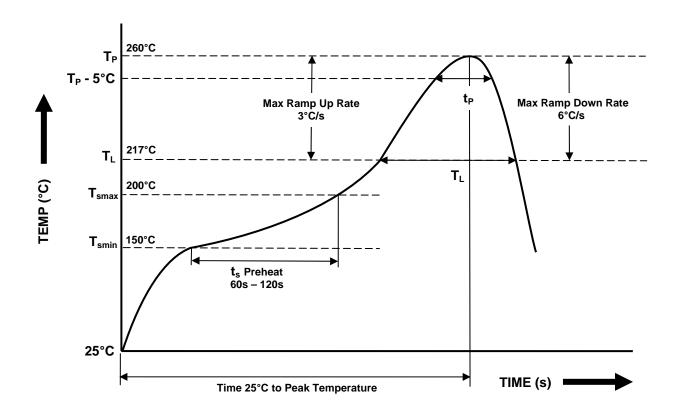




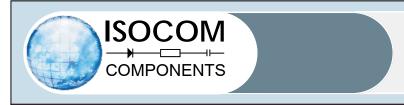
Dimension No.	Α	В	Do	D1	E	F
Dimension (mm)	10.4±0.1	7.5±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1
Dimension No.	Ро	P1	P2	t	W	К



IR REFLOW SOLDERING TEMPERATURE PROFILE (One Time Reflow Soldering is Recommended)



Profile Details	Conditions
$ \begin{array}{l} \textbf{Preheat} \\ \textbf{- Min Temperature } (T_{SMIN}) \\ \textbf{- Max Temperature } (T_{SMAX}) \\ \textbf{- Time } T_{SMIN} \text{ to } T_{SMAX} \left(t_s\right) \end{array} $	150°C 200°C 60s - 120s
	260°C 217°C 30s 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T _{smax} to T _P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max



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- Do not immerse device body in solder paste.



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