



Description

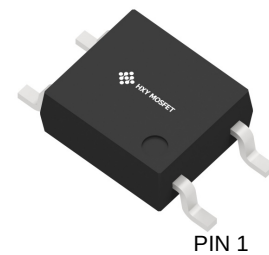
The ELM3053(TA) series devices are optocouplers composed of a GaAs infrared light emitting diode and a single-crystal silicon chip random phase photoelectric bidirectional thyristor.

Features

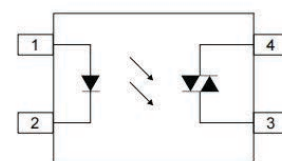
- Peak breakdown voltage
- ELM3053(TA): Min.600V
- 4pin non zero-cross optoisolators triac driver outp
- High input-output isolation voltage($V_{iso} = 3,750V_{rms}$)
- Operating Temperature: $-40^{\circ}C \sim 110^{\circ}C$
- RoHS

Applications

- Lighting Control
- AC Motor Starter
- Static power switch
- Temperature Controls



SOP-4



Pin Configuration

- 1 Anode
- 2 Cathode
- 3 GND
- 4 VCC

Maximum Rating

Parameter		Symbol	Values	Unit
Input	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	100	mW
	Junction Temperature	T_J	125	$^{\circ}C$
Output	Off-State Output Terminal Voltage	V_{DRM}	600	V
	On state RMS current	$I_{T(RMS)}$	100	mA(RMS)
	Peak Repetitive Surge Current (PW=1ms, 120pps)	I_{TSM}	1	A
	Junction Temperature	T_J	125	$^{\circ}C$
	Collector Power Dissipation	P_C	300	mW
Operating temperature range		T_{op}	$-40 \sim 110$	$^{\circ}C$
Storage temperature range		T_{stg}	$-55 \sim 125$	$^{\circ}C$
Total Power consumption		$P_{(W)}$	330	mW
Isolation Voltage ⁽¹⁾		V_{ISO}	3750	Vrms
Soldering Temperature ⁽²⁾		T_{SOL}	260	$^{\circ}C$

Notes:

(1). AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

(2).For 10 seconds



Electronic Optical Characteristics
(TA = 25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditon
Input	Forward Voltage	V_F	-	1.2	1.6	V	$I_F=10\text{mA}$
	Reverse Current	I_R	-	-	5	μA	$V_R=6\text{V}$
Output	Peak Blocking Current, Either Directiot ⁽¹⁾	I_{DRM}	-	-	100	nA	$V_{\text{DRM}} = \text{Rated VDRM}$
	Peak On-State Voltage, Either Dire	V_{TM}	-	-	2.5	V	$I_{\text{TM}}=100\text{mA}$ Peak
	Critical rate of Rise of Off-State Voltage ⁽²⁾	dv/dt	1000	-	-	V/ μs	$V_{\text{in}}=240\text{Vrms}$
Transfer Charact eristics	Led Trigger Current, Current Required to Latch Output, Either Direction	I_{FT}	-	-	5	mA	Main Terminal Voltage = 3V
	Holding Current, Either Direction	I_H	0.5	1.0	5.0	mA	
	Turn-On Time	T_{on}	-	-	100	μs	$V_D=6\text{V}$ $R_L=100\ \Omega$ $I_F=20\text{mA}$

(1)Test voltage must be applied within dv/dt rating.

(2)This is static dv/dt . Commutating dv/dt is a function of the load-driving thyristor(s) only.



Characteristics Curves

Fig.1 Forward current vs.Ambient temperature

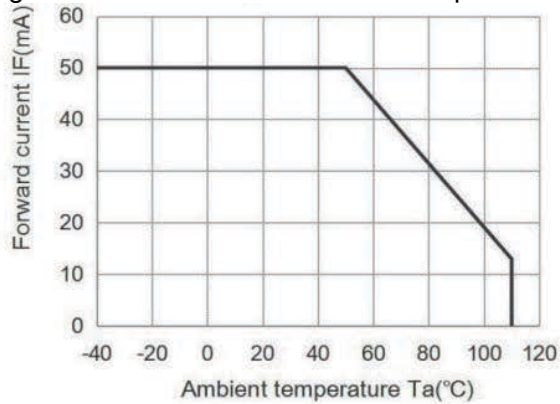


Fig.2 On-state current ITM (A) vs.Ambient temperature

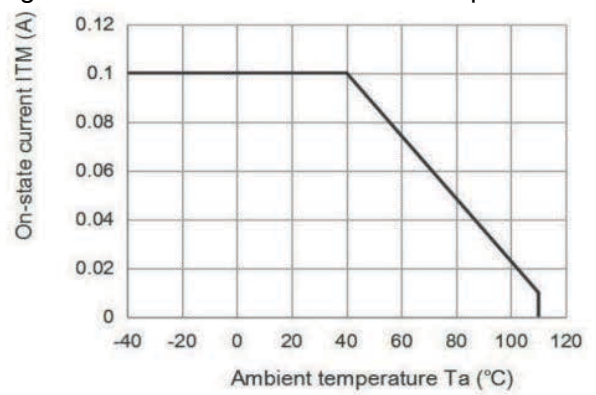


Fig.3 Minimum Trigger Current vs.Ambient temperature

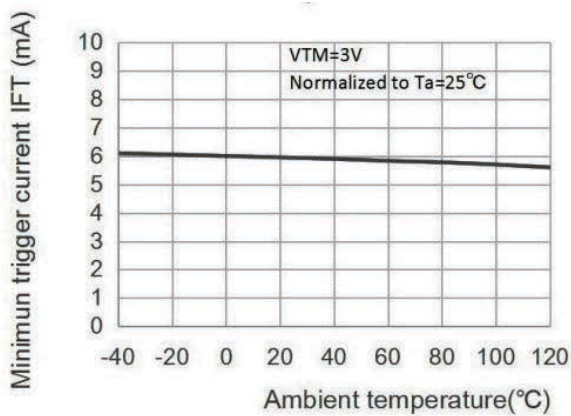


Fig.4 Forward current vs Forward Voltage

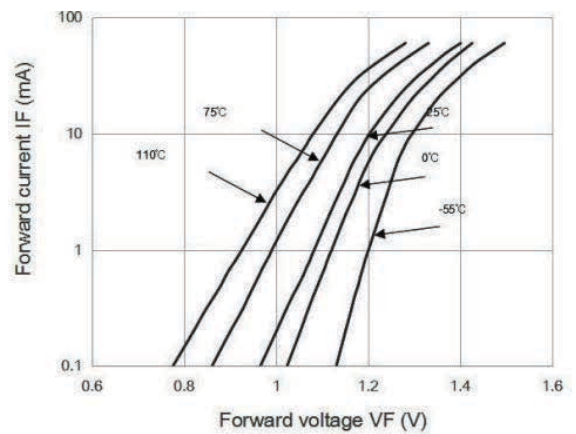


Fig.5 On-state voltage vs . Ambient temperature

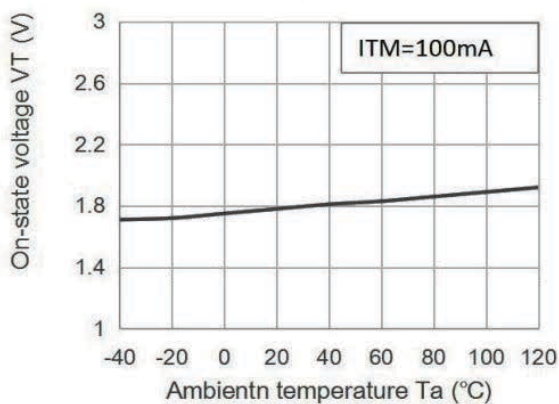


Fig.6 Holding current IH (mA) vs Ambient temperature

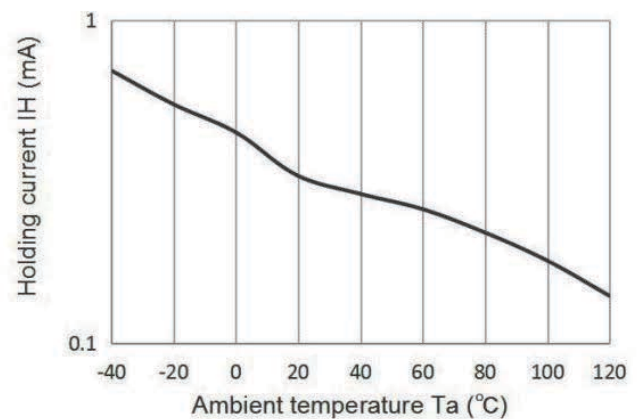




Fig.7 Repetitive peak off-state current vs Temperature

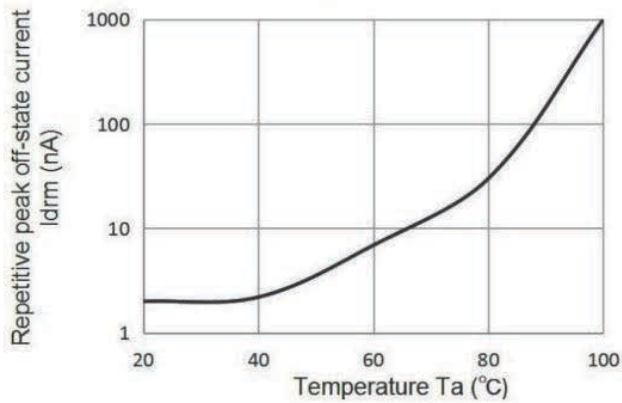


Fig.8 On-state current vs On-state voltage

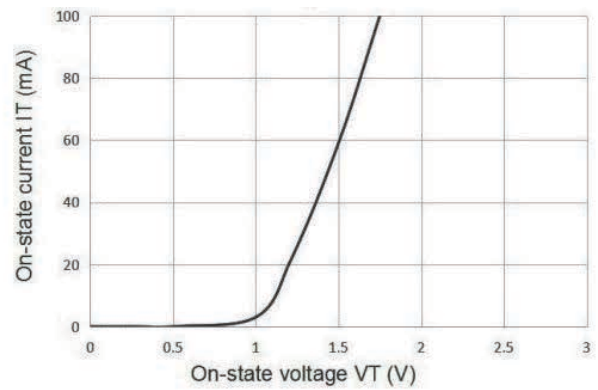


Fig.9 Basic Operation Circuit Medium/High Power Triac Drive Circuit

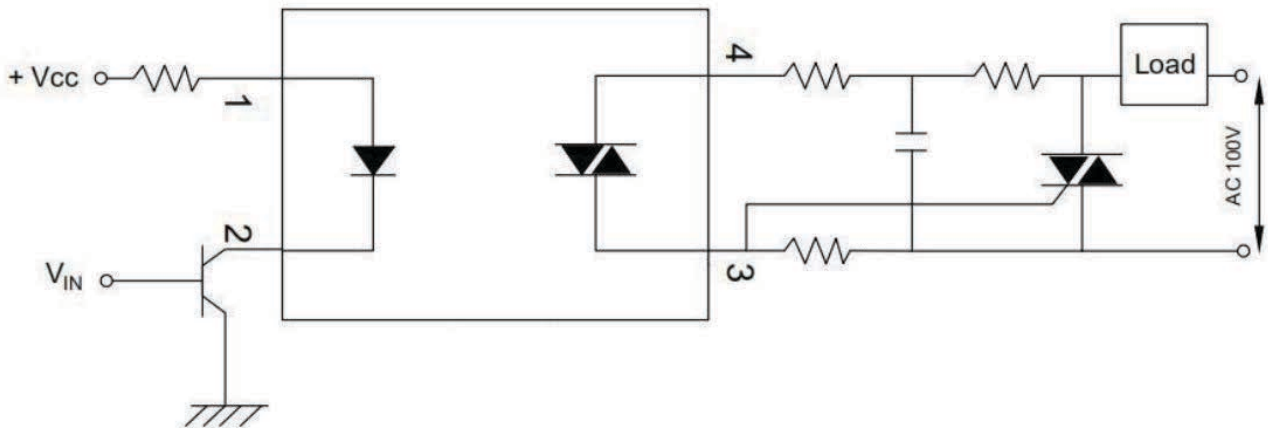
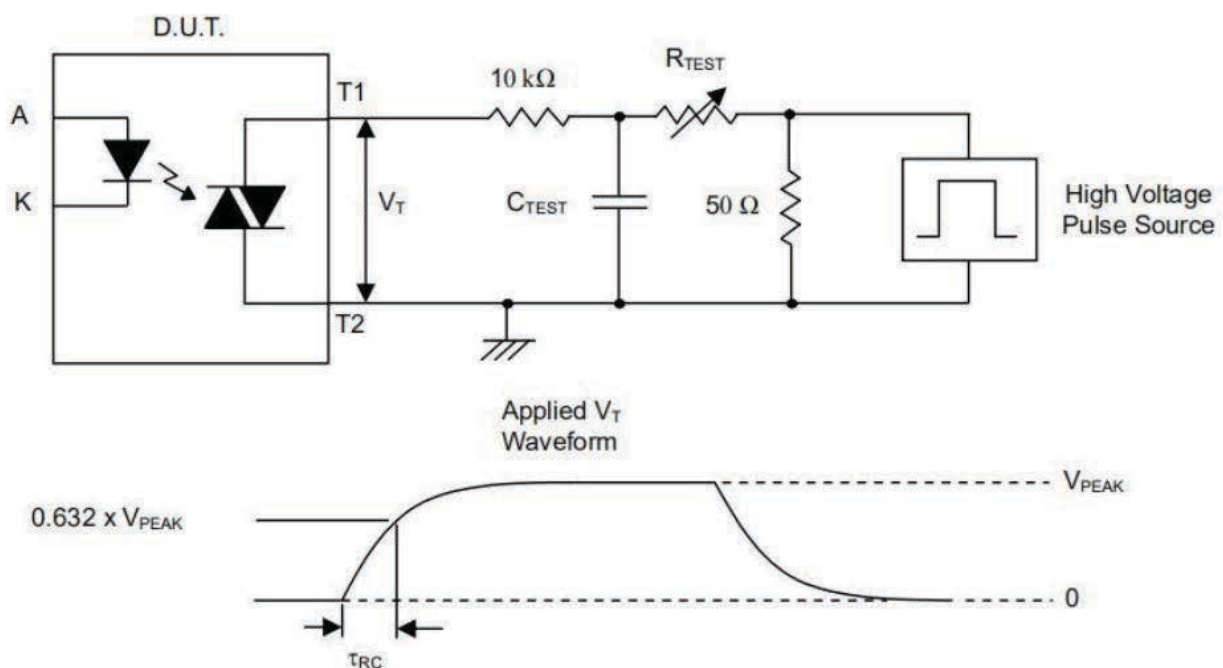
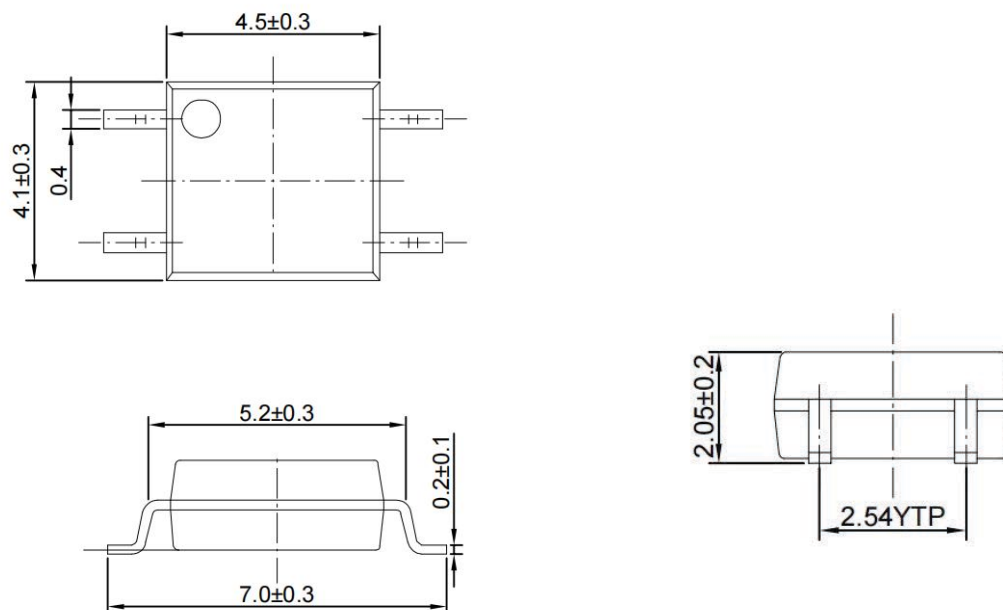


Fig10.Static dv/dt Test Circuit & Waveform





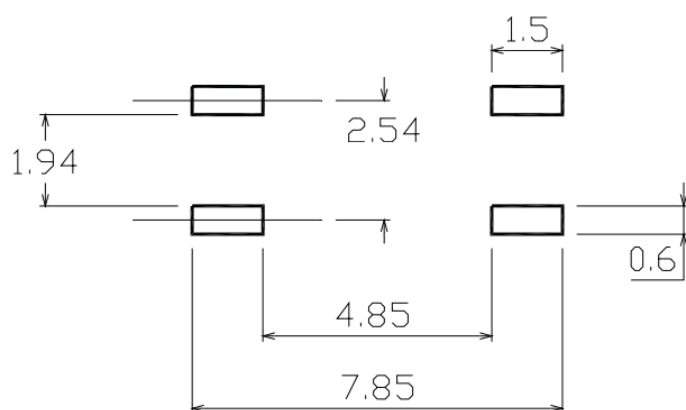
Outline Dimension



Unit: mm

Tolerance: ± 0.1 mm

Recommended solder pad Design



Unit: mm

Tolerance: ± 0.1 mm

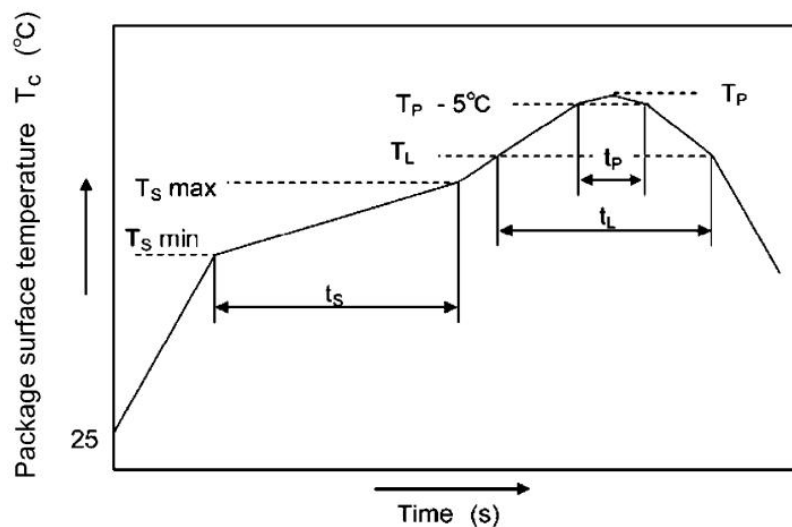


Temperature Profile Of Soldering

1. IR Reflow soldering

(JEDEC-STD-020D compliant)

Profile item	Conditon
Preheat	
-Temperature Min (TSmin)	150°C
-Temperature Max (TSmax)	200°C
-Time (min to max) (ts)	90±30 sec
Soldering zone	
-Temperature (TL)	217°C
-Time (tL)	60-150 sec
Peak Temperature (TP)	260°C
-Time (TP-5°C to TP) (ts)	30sec
Ramp-up rate	3°C / sec max
Ramp-down rate	3~6°C/ sec



Notes:

One time soldering reflow is recommended within the condition of temperature and time profile shown below.
Do not solder more than three times.



2. Wave soldering (JEDEC22A111 compliant)

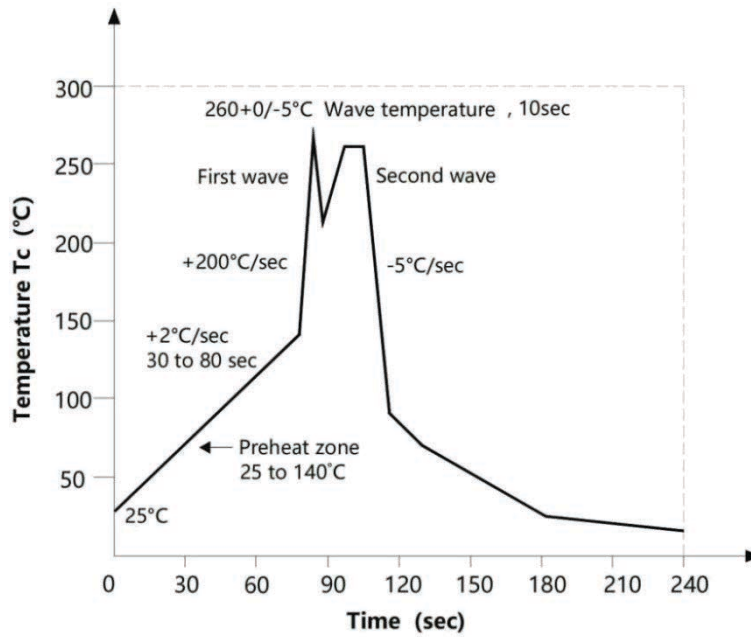
One time soldering is recommended within the condition.

Temperature: $260 \pm 0/-5^\circ\text{C}$.

Time: 10 sec.

Preheat temperature: 25 to 140°C .

Preheat time: 30 to 80 sec.



3. Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

Temperature: $380 \pm 0/-5^\circ\text{C}$

Time: 3 sec max.



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