

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

# SM2G54, SM2L54

## AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage :  $V_{DRM} = 800V$
- R.M.S. On-State Current :  $I_T (RMS) = 2A$
- High Commutation ( $dv / dt$ ) :  $(dv / dt) c = 5V / \mu s$  (Min.)

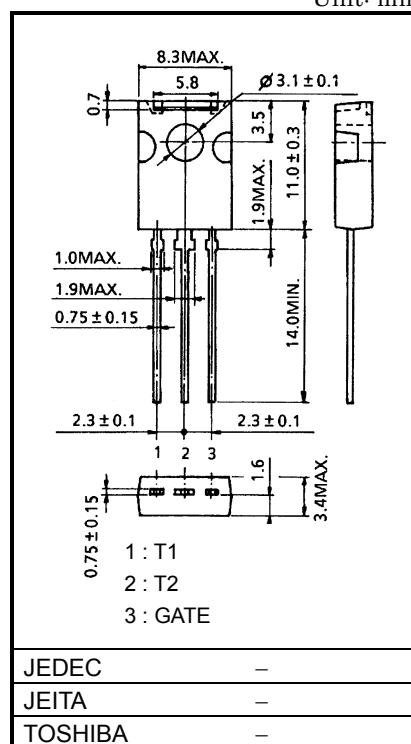
## MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	$V_{DRM}$	800	V
R.M.S. On-State Current (Full Sine Waveform)	$I_T (RMS)$	2	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	$I_{TSM}$	8 (50Hz) 8.8 (60Hz)	A
$I^2t$ Limit Value	$I^2t$	0.32	$A^2s$
Critical Rate of Rise of On-State Current (Note)	$di / dt$	50	A / $\mu s$
Peak Gate Power Dissipation	$P_{GM}$	3	W
Average Gate Power Dissipation	$P_G (AV)$	0.3	W
Peak Gate Voltage	$V_{FGM}$	10	V
Peak Gate Current	$I_{GM}$	1.6	A
Junction Temperature	$T_j$	-40~125	°C
Storage Temperature Range	$T_{stg}$	-40~125	°C

Note:  $di / dt$  test condition

$V_{DRM} = 400V$ ,  $I_{TM} \leq 3A$ ,  $t_{gw} \geq 10\mu s$ ,  $t_{gr} \leq 250ns$ ,  $i_{gp} = I_{GT} \times 2.0$

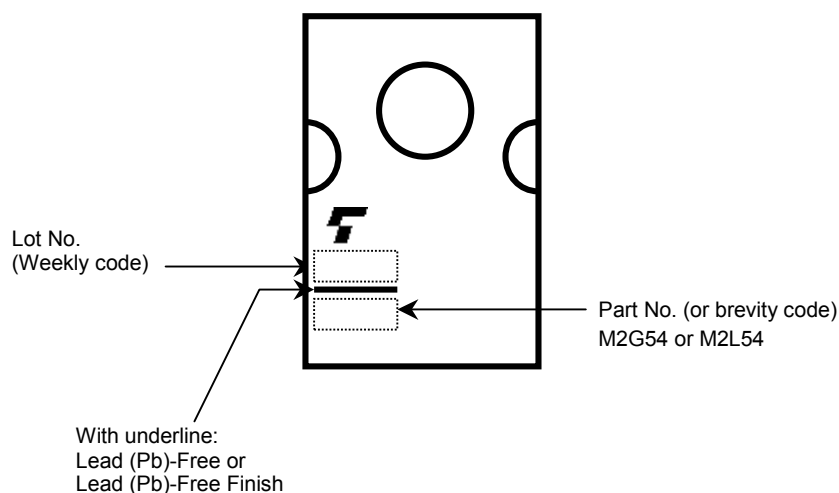
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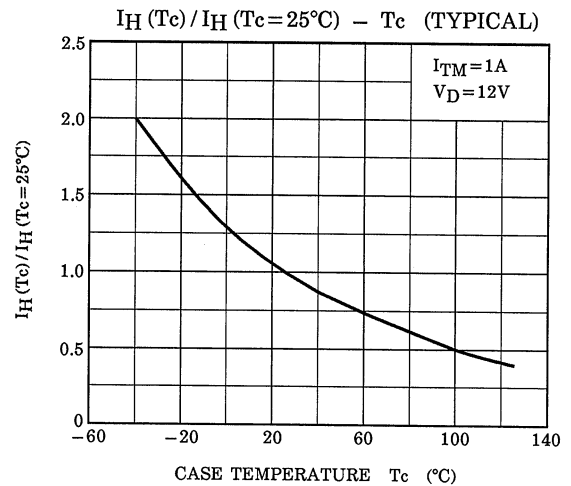
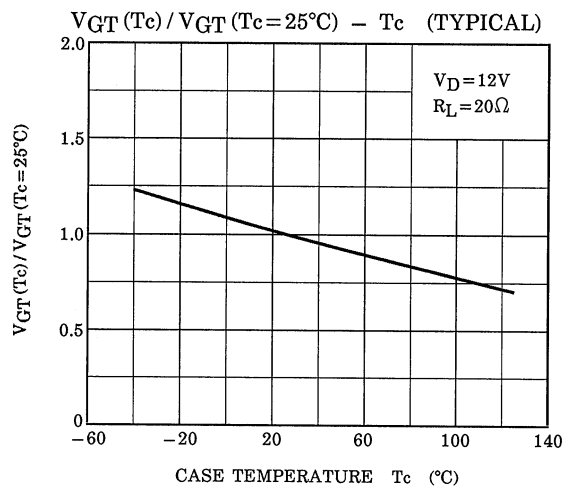
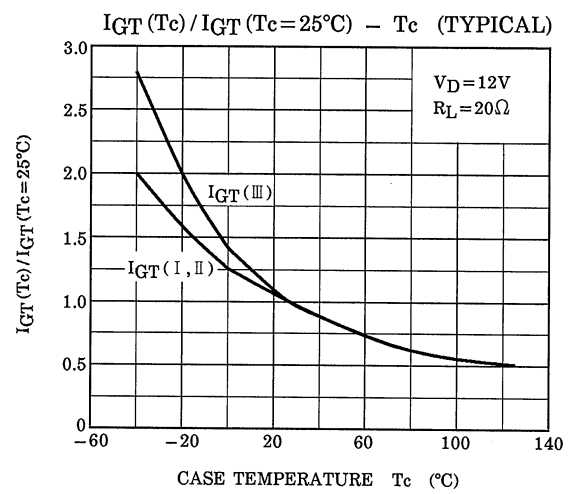
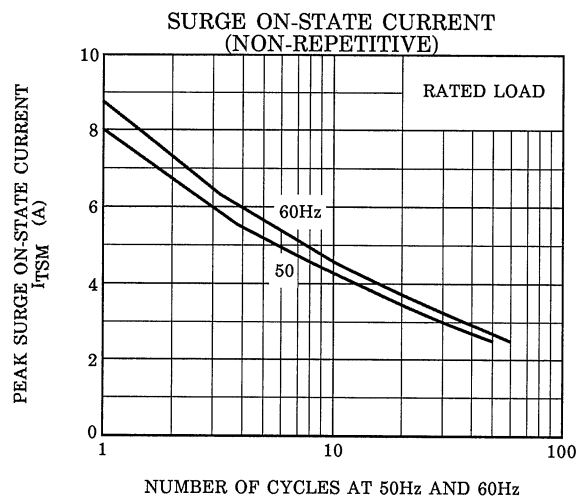
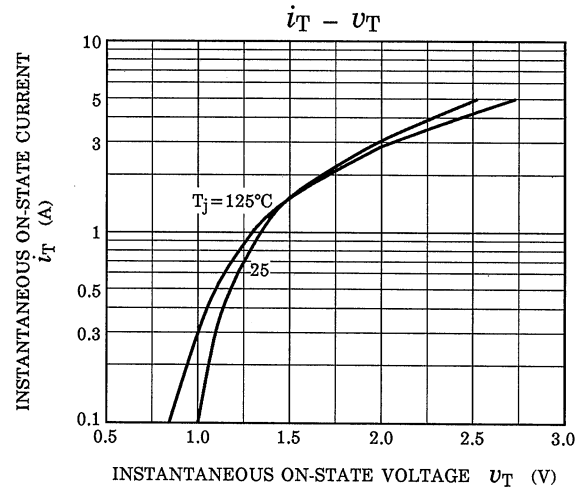
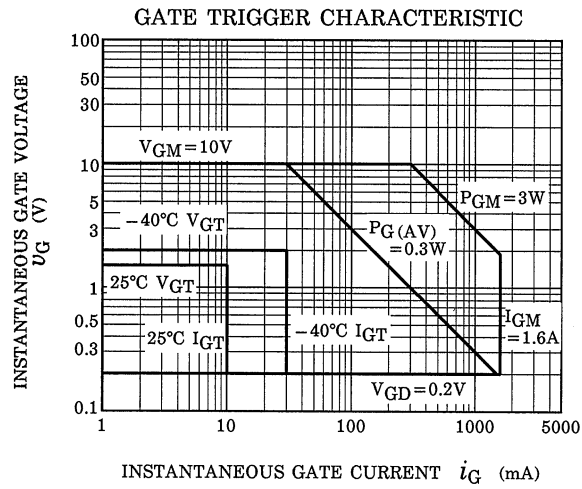


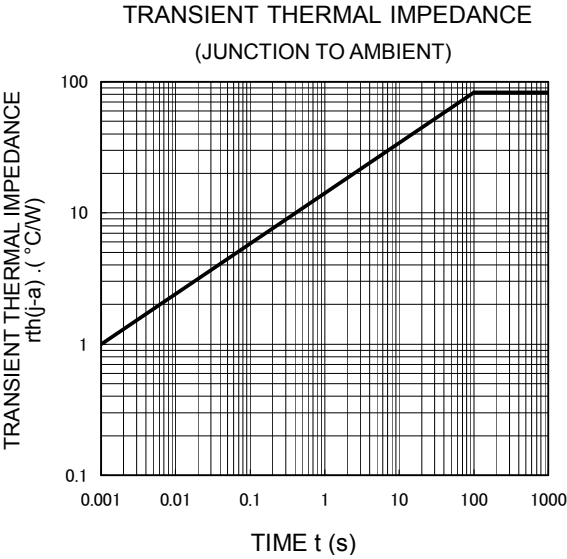
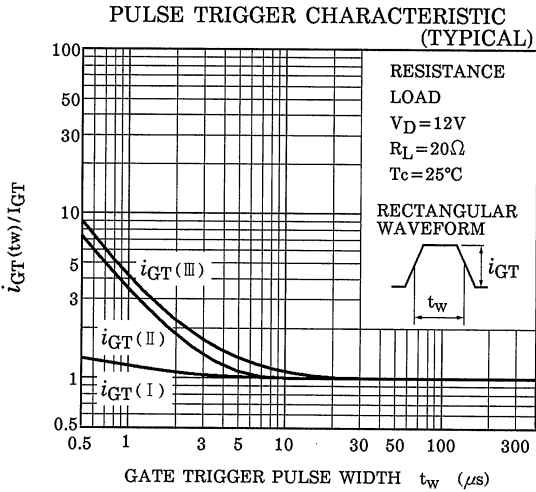
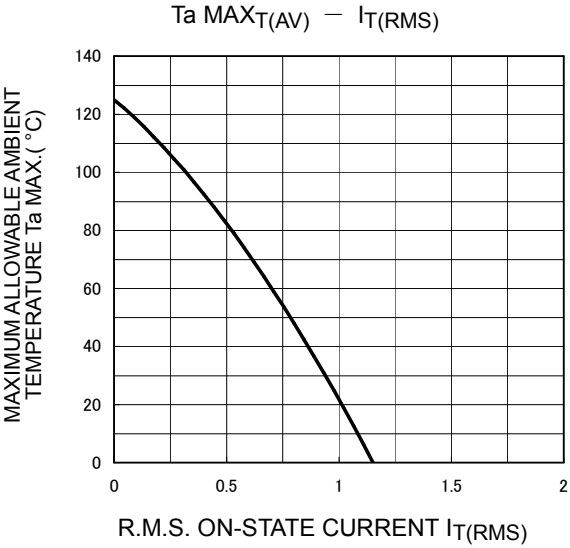
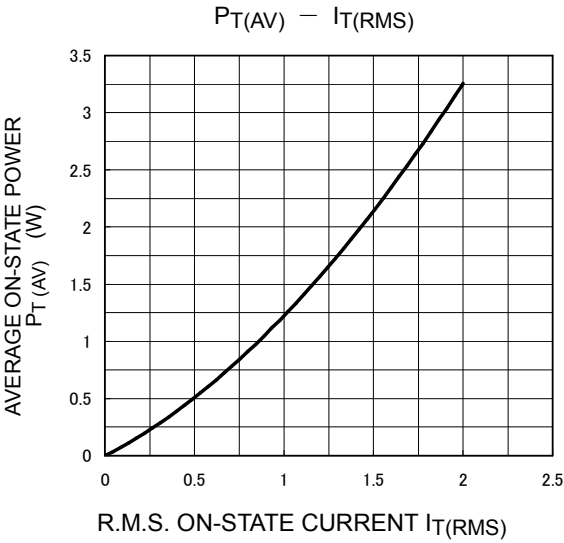
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Repetitive Peak Off-State Current		$I_{DRM}$	$V_{DRM} = 800V$		–	–	20	$\mu A$
Gate Trigger Voltage	I	$V_{GT}$	$V_D = 12V$ , $R_L = 20\Omega$	T2 (+) , Gate (+)	–	–	1.5	V
	II			T2 (+) , Gate (–)	–	–	1.5	
	III			T2 (–) , Gate (–)	–	–	1.5	
Gate Trigger Current	I	$I_{GT}$	$V_D = 12V$ , $R_L = 20\Omega$	T2 (+) , Gate (+)	–	–	10	mA
	II			T2 (+) , Gate (–)	–	–	10	
	III			T2 (–) , Gate (–)	–	–	10	
Peak On-State Voltage		$V_{TM}$	$I_{TM} = 3A$		–	–	2.0	V
Gate Non-Trigger Voltage		$V_{GD}$	$V_D = 800V$ , $T_c = 125^\circ C$		0.2	–	–	V
Holding Current		$I_H$	$V_D = 12V$ , $I_{TM} = 1A$		–	–	10	mA
Thermal Resistance		$R_{th(j-a)}$	Junction to Ambient, AC		–	–	83	$^\circ C / W$
Critical Rate of Rise of Off-State Voltage		$dv / dt$	$V_{DRM} = 800V$ , $T_j = 125^\circ C$ Exponential Rise		50	–	–	V / $\mu s$
Critical Rate of Rise of Off-State Voltage at Communication		$(dv / dt)_c$	$V_{DRM} = 400V$ , $T_j = 80^\circ C$ $(di / dt)_c = -0.5A / ms$		5	–	–	V / $\mu s$

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