

# TOSHIBA SM16(G,J)48,USM16(G,J)48,SM16(G,J)48A,USM16(G,J)48A

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

## SM16G48,USM16G48,SM16J48,USM16J48 SM16G48A,USM16G48A,SM16J48A,USM16J48A

### AC POWER CONTROL APPLICATIONS

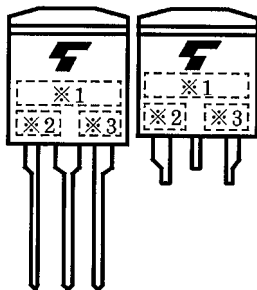
- Repetitive Peak Off-State Voltage :V<sub>DRM</sub>=400, 600V
- R.M.S On-State Current :I<sub>T</sub> (RMS)=16A
- Gate Trigger Current :I<sub>GT</sub>=30mA Max.  
:I<sub>GT</sub>=20mA Max. ("A"Type)

Unit in mm

SM16G48, SM16J48, SM16G48A, SM16J48A	USM16G48, USM16J48, USM16G48A, USM16J48A
JEDEC —	JEDEC —
JEITA —	JEITA —
TOSHIBA 13-10J1A	TOSHIBA 13-10J2A

Weight : 1.7g

### MARKING



NUMBER	SYMBOL	MARK
*1	SM16G48, SM16G48A, USM16G48, USM16G48A	M16G48
	SM16J48, SM16J48A, USM16J48, USM16J48A	M16J48
*2	SM16G48A, SM16J48A, USM16G48A, USM16J48A	A
*3	Lot Number  Month (Starting from Alphabet A) Year (Last Decimal Digit of the Year of Manufacture)	Example 8A : January 1998 8B : February 1998 8L : December 1998

# TOSHIBA SM16(G,J)48,USM16(G,J)48,SM16(G,J)48A,USM16(G,J)48A

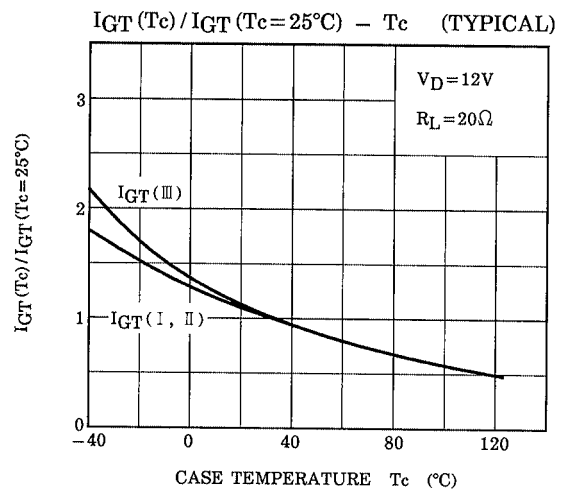
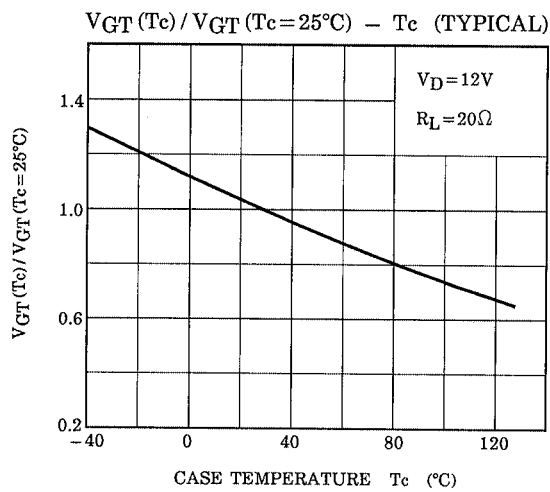
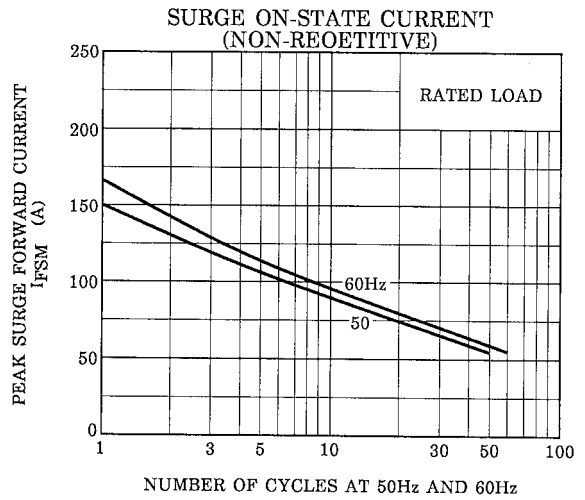
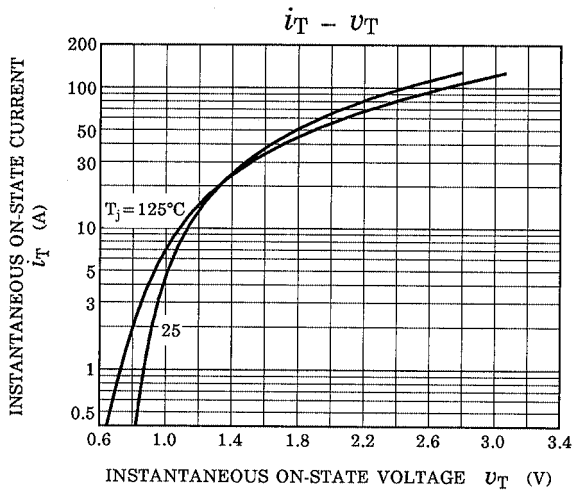
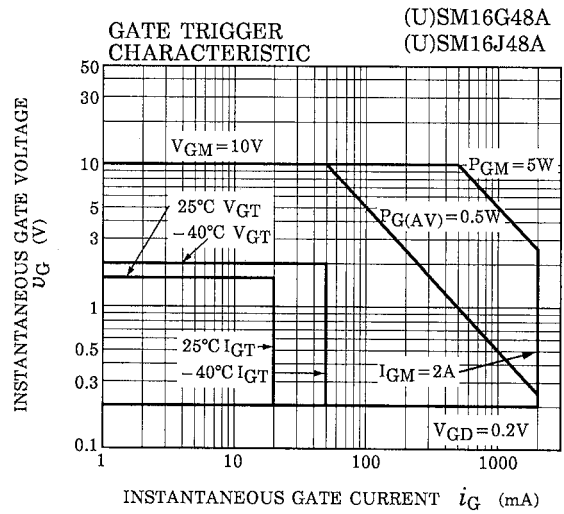
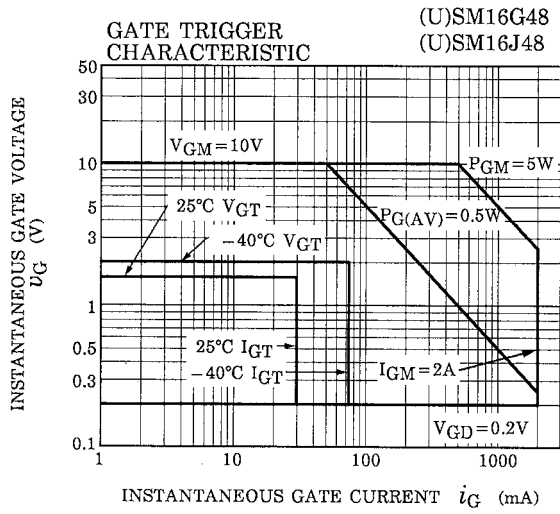
## MAXIMUM RATINGS (Ta=25°C)

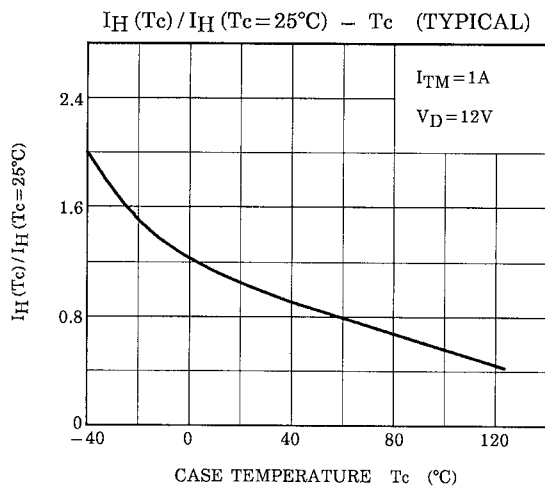
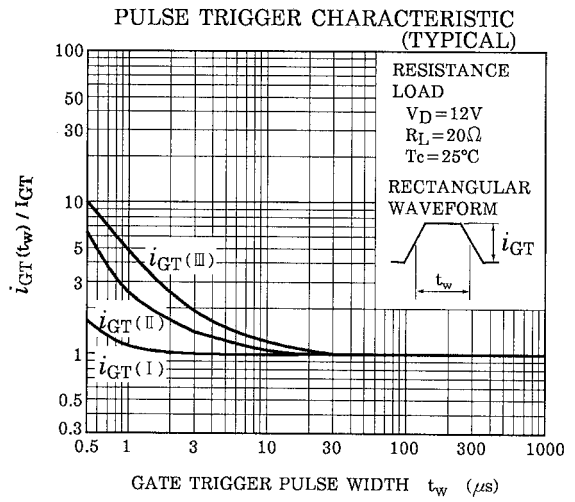
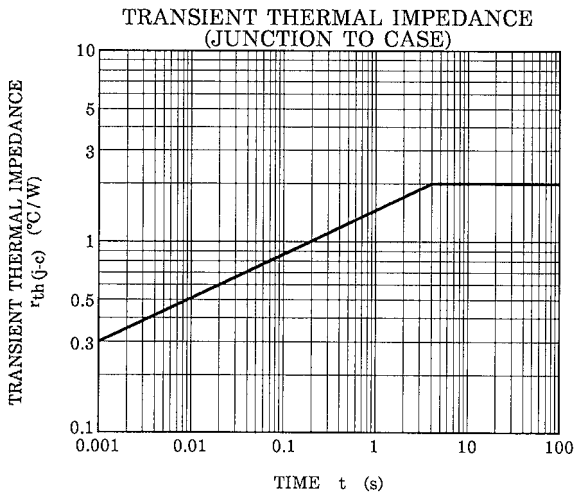
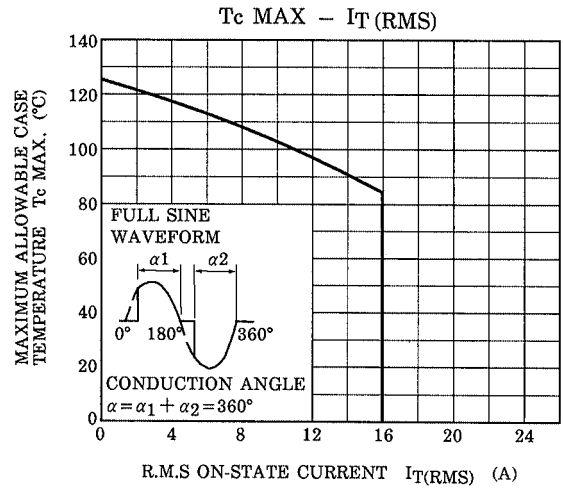
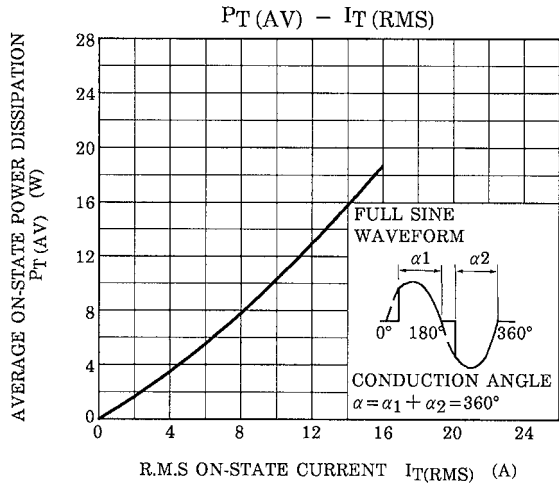
CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	(U)SM12G48 (U)SM12G48A	V <sub>DRM</sub>	400	V
	(U)SM12J48 (U)SM12J48A		600	
R.M.S On-State Current		I <sub>T (RMS)</sub>	16	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I <sub>TSM</sub>	150 (50Hz)	A
			165 (60Hz)	
I <sup>2</sup> t Limit Value		I <sup>2</sup> <sub>t</sub>	112.5	A <sup>2</sup> s
Critical Rate of Rise of On-State Current (Note 1)		di / dt	50	A / μs
Peak Gate Power Dissipation		P <sub>GM</sub>	5	W
Average Gate Power Dissipation		P <sub>G (AV)</sub>	0.5	W
Peak Forward Gate Voltage		V <sub>GM</sub>	10	V
Peak Forward Gate Current		I <sub>GM</sub>	2	A
Junction Temperature		T <sub>j</sub>	-40~125	°C
Storage Temperature Range		T <sub>stg</sub>	-40~125	°C

Note 1 : V<sub>DRM</sub>=0.5×Rated  
I<sub>TM</sub>≤25A  
t<sub>gw</sub>≥10μs  
t<sub>gr</sub>≤250ns  
i<sub>gp</sub>=I<sub>GT</sub>×2.0

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current		I <sub>DRM</sub>	V <sub>DRM</sub> =Rated	—	—	20	μA	
Gate Trigger Voltage		I II III IV	V <sub>GT</sub> V <sub>D</sub> =12V R <sub>L</sub> =20Ω	T2 (+), Gate (+)	—	—	1.5	V
				T2 (+), Gate (-)	—	—	1.5	
				T2 (-), Gate (-)	—	—	1.5	
				T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	(U)SM16G48 (U)SM16J48	I II III IV	V <sub>GT</sub> V <sub>D</sub> =12V R <sub>L</sub> =20Ω	T2 (+), Gate (+)	—	—	30	mA
				T2 (+), Gate (-)	—	—	30	
				T2 (-), Gate (-)	—	—	30	
				T2 (-), Gate (+)	—	50	—	
	(U)SM16G48A (U)SM16J48A	I II III IV		T2 (+), Gate (+)	—	—	20	
				T2 (+), Gate (-)	—	—	20	
				T2 (-), Gate (-)	—	—	20	
				T2 (-), Gate (+)	—	—	—	
Peak On-State Voltage		V <sub>TM</sub>	I <sub>TM</sub> =17A	—	—	1.5	—	
Gate Non-Trigger Voltage		V <sub>GD</sub>	V <sub>D</sub> =Rated, T <sub>c</sub> =125°C	0.2	—	—	V	
Holding Current		I <sub>H</sub>	V <sub>D</sub> =12V, I <sub>TM</sub> =1A	—	—	50	mA	
Thermal Resistance		R <sub>th (j-c)</sub>	Junction to Case, AC	—	—	2.0	°C / W	
Critical Rate of Rise of Off-State Voltage	(U)SM16G48 (U)SM16J48	dv / dt	V <sub>DRM</sub> =Rated, T <sub>j</sub> =125°C Exponential Rise	—	300	—	V / μs	
	(U)SM16G48A (U)SM16J48A			—	200	—		
Critical Rate of Rise of Off-State Voltage at Commutation	(U)SM16G48 (U)SM16J48	(dv / dt) <sub>c</sub>	V <sub>DRM</sub> =400V, T <sub>j</sub> =125°C (di / dt) <sub>c</sub> =-8.7A / ms	10	—	—	V / μs	
	(U)SM16G48A (U)SM16J48A			4	—	—		





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