New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

T6401, T6411, T6421 Series

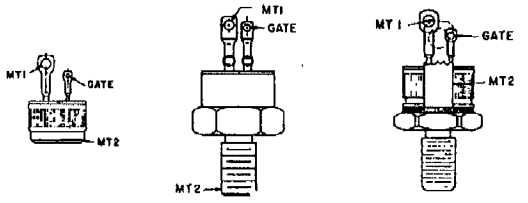
30-A Silicon Triacs

For Power-Switching and Power Control

Features:

- *800V, 125 Deg. C T_J Operating*
- *High dv/dt and di/dt Capability*
- *Low Switching Losses*
- *High Pulse Current Capability*
- *Low Forward and Reverse Leakage*
- *Sipos Oxide Glass Multilayer Passivation System*
- *Advanced Unisurface Construction*
- *Precise Ion Implanted Diffusion Source*

TERMINAL DESIGNATIONS



PRESS-FIT TYPES T6401 SERIES	STUD TYPES T6411 SERIES	ISOLATED-STUD TYPES T6421 SERIES

MAXIMUM RATINGS, *Absolute-Maximum Values:*

		T6401B T6411B T6421B	T6401D T6411D T6421D	T6401M T6411M T6421M	T6401N T6411N —	
REPETITIVE PEAK OFF-STATE VOLTAGE:*						
Gate open, T_J = -50 to 125° C	V_{DROM}	200	400	600	800	V
RMS ON-STATE CURRENT (Conduction angle = 360°):	$I_{T(RMS)}$					
Case temperature						
T_C = 90° C (Press-fit types)		30				A
= 85° C (Stud types)		30				A
= 80° C (Isolated-stud types)		30				A
For other conditions		See Fig. 3				
PEAK SURGE (NON-REPETITIVE) ON-STATE CURRENT:	I_{TSM}					
For one cycle of applied principal voltage						
60 Hz (sinusoidal)		300				A
50 Hz (sinusoidal)		265				A
For more than one cycle of applied principal voltage		See Fig. 4				
RATE-OF-CHANGE OF ON-STATE CURRENT:	di/dt					
$V_{DM} = V_{DROM}$, I_{GT} = 200 mA, t_r = 0.1 μs (See Fig. 13)		100				A/μs
FUSING CURRENT (for triac protection):	I^2t					
T_J = -40 to 100° C, t = 1.25 to 10 ms		450				A^2s
PEAK GATE-TRIGGER CURRENT:■	I_{GTM}					
For 1 μs max., See Fig. 7		12				A
GATE POWER DISSIPATION:						
PEAK (For 1 μs max., $I_{GTM} \leq$ 4 A, See Fig. 7)	P_{GM}	40				W
AVERAGE	$P_{G(AV)}$	0.75				W
TEMPERATURE RANGE:▲						
Storage	T_{stg}	-65 to 150				°C
Operating (Case)	T_C	-65 to 100				°C
TERMINAL TEMPERATURE (During soldering):	T_T					
For 10 s max. (terminals and case)		225				°C
STUD TORQUE:						
Recommended		35				in-lb
Maximum (DO NOT EXCEED)		50				in-lb

*For either polarity of main terminal 2 voltage (V_{MT2}) with reference to main terminal 1.
■For either polarity to gate voltage (V_G) with reference to main terminal 1.
▲For temperature measurement reference point, see Dimensional Outline.

ELECTRICAL CHARACTERISTICS, *At Maximum Ratings Unless Otherwise Specified, and at Indicated Temperature*

CHARACTERISTIC	SYMBOL	LIMITS For All Types Unless Otherwise Specified			UNITS
		Min.	Typ.	Max.	
Peak Off-State Current:•					
Gate open, T_J = 125°C, V_{DROM} = Max. rated value	I_{DROM}	—	0.2	4	mA
Maximum On-State Voltage:•					
For I_T = 100 A (peak), T_C = 25°C	V_{TM}	—	2.1	2.5	V
DC Holding Current:•					
Gate open, Initial principal current = 150 mA (DC), v_D = 12V:					
T_C = 25°C	I_{HO}	—	25	60	mA
For other case temperatures			See Fig. 6		
Critical Rate-of-Rise of Commutation Voltage:•					
For $v_D = V_{DROM}$, $I_{T(RMS)}$ = 30 A, commutating					
di/dt = 16 A/ms, gate unenergized (See Fig. 14):					
T_C = 90°C (Press-fit types)		3	20	—	
= 85°C (Stud types)	dv/dt	3	20	—	V/μs
= 80°C (Isolated-stud types)		3	20	—	
Critical Rate-of-Rise of Off-State Voltage:•					
For $v_D = V_{DROM}$, exponential voltage rise, gate open,					
T_C = 125°C:					
T6401B, T6411B, T6421B		40	200	—	
T6401D, T6411D, T6421D	dv/dt	25	150	—	V/μs
T6401M, T6411M, T6421M		20	100	—	
T6401N, T6411N		10	50		
DC Gate-Trigger Current:•■ Mode V_{MT2} V_G					
For v_D = 12 V (DC), I+ positive positive		—	15	50	
R_L = 30 Ω, III− negative negative		—	20	50	
T_C = 25°C I− positive negative	I_{GT}	—	30	80	mA
III+ negative positive		—	40	80	
For other case temperatures			See Figs. 8 & 9		
DC Gate-Trigger Voltage:•■					
For v_D = 12 V(DC), R_L = 30 Ω,					
T_C = 25°C	V_{GT}	—	1.35	2.5	V
For other case temperatures			See Fig. 10		
For $v_D = V_{DROM}$, R_L = 125 Ω, T_C = 100°C		0.2	—	—	
Gate-Controlled Turn-On Time:					
(Delay Time + Rise Time)					
For $v_D = V_{DROM}$, I_{GT} = 200 mA, t_r = 0.1 μs,					
i_T = 45 A (peak), T_C = 25°C (See Figs. 7 & 12)	t_{gt}	—	1.7	3	μs
Thermal Resistance, Junction-to-Case:					
Steady-State					
Press-fit types		—	—	0.8	
Stud	$R_{\theta JC}$	—	—	0.9	°C/W
Transient (Press-fit & stud types)			See Fig. 2		
Thermal Resistance, Junction-to-Hex (Stud, See Dim. Outline):					
Steady-State (Isolated-stud types)	$R_{\theta JH}$	—	—	1	

•For either polarity of main terminal 2 voltage (V_{MT2}) with reference to main terminal 1.
■For either polarity of gate voltage (V_G) with reference to main terminal 1.