

T812 2300-44-52

Key Parameters

V_{DSM}	4400~5200	V
$I_{T(AV)}$	2360	A
I_{TSM}	42	kA
V_{TO}	1.01	V
r_T	0.23	mΩ

Applications

High power drive
High voltage supplies
Motor control

Features

Double-side cooling
High mean current
High surge current

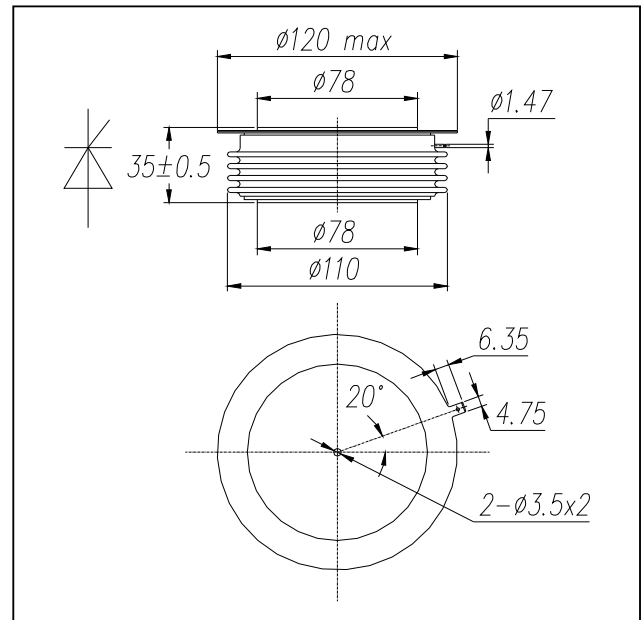
Thermal & Mechanical Data

Symb.	Parameter	Min	Type	Max	Unit
R_{jc}	Thermal Resistance Junction to Case	-	-	0.009	K / W
R_{cs}	Thermal Resistance Case to Heatsink	-	-	0.002	K / W
T_{vj}	Junction Temperature	-40	-	125	°C
T_{stg}	Storage Temperature	-40	-	140	°C
F	Mounting Force	-	70	-	kN
m	Weight	-	1.67	-	kg

Voltage Ratings

Device Type	V_{DSM}/V_{RSM} (V)	Test Conditions
T812 2300-44	4400	$T_C = 25, 125\text{ °C}$
T812 2300-46	4600	$I_{DRM} = I_{RRM} = 600\text{ mA}$
T812 2300-48	4800	
T812 2300-50	5000	$V_{DM} = V_{DRM}$
T812 2300-52	5200	$V_{RM} = V_{RRM}$ $t_p = 10\text{ ms}$
		$V_{DRM} = V_{DSM} - 600$ $V_{RRM} = V_{RSM} - 600$

Outline



Current Ratings

Symb.	Parameter	Test Conditions	Min	Type	Max	Unit
$I_{T(AV)}$	Mean On-State Current	Half Sine Wave, $T_C = 70\text{ °C}$	-	-	2360	A
$I_{T(RMS)}$	RMS On-State Current	$T_C = 70\text{ °C}$	-	-	3710	A
I_{TSM}	Surge (non-repetitive) On-State Current	10ms, Half Sine Wave, $T_C = 125\text{ °C}$, $V_R = 0$	-	-	42.0	kA
I^2t	Limiting load integral	Sine Wave, 10ms	-	-	882	$10^4 A^2s$

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Characteristics

Symb.	Parameter	Test Conditions	Min	Type	Max	Unit
V_{TM}	Peak on-state voltage	$T_C = 25\text{ }^{\circ}\text{C}$, $I_{TM} = 3000\text{ A}$	-	-	1.70	V
I_{DRM}	Forward leakage current	$T_C = 25\text{ }^{\circ}\text{C}$, $125\text{ }^{\circ}\text{C}$, V_{DRM}/V_{RRM}	-	-	600	mA
I_{RRM}	Reverse leakage current		-	-		
V_{TO}	Threshold voltage	$T_{vj} = 125\text{ }^{\circ}\text{C}$	-	-	1.01	V
r_T	Slope resistance	$T_{vj} = 125\text{ }^{\circ}\text{C}$	-	-	0.23	m Ω
I_H	Holding current	$T_{vj} = 25\text{ }^{\circ}\text{C}$	-	-	200	mA
I_L	Latching current	$T_{vj} = 25\text{ }^{\circ}\text{C}$	-	-	1000	mA

Dynamic Parameters

Symb.	Parameter	Test Conditions	Min	Type	Max	Unit
dv/dt	Critical rate of rise of off-state voltage	$T_C = 125\text{ }^{\circ}\text{C}$, $67\% V_{DRM}$	2000	-	-	V/ μ s
di/dt	Critical rate of rise of on-state current	$T_C = 125\text{ }^{\circ}\text{C}$, $V_{DM} = 2/3 V_{DRM}$, $f = 50\text{ Hz}$, $I_{TM} = 3000\text{ A}$, $I_{FG} = 2\text{ A}$, $t_r = 0.5\text{ }\mu\text{s}$	-	-	200	A/ μ s
t_q	Turn-off time	$T_C = 125\text{ }^{\circ}\text{C}$, $V_{DM} = 67\% V_{DRM}$, $I_T = 2000\text{ A}$, $dv/dt = 20\text{ V}/\mu\text{s}$, $V_R = 200\text{ V}$, $-di/dt = 1.5\text{ A}/\mu\text{s}$	-	700	-	μ s
Q_r	Recovery Charge	$T_{vj} = 125\text{ }^{\circ}\text{C}$, $-di/dt = 1.5\text{ A}/\mu\text{s}$, $I_T = 2000\text{ A}$, $V_R = 200\text{ V}$	-	5000	-	μ C

Gate Parameters

Symb.	Parameter	Test Conditions	Min	Type	Max	Unit
I_{GT}	Gate trigger current	$T_C = 25\text{ }^{\circ}\text{C}$, $V_D = 12\text{ V}$, $R_L = 6\Omega$	-	-	300	mA
V_{GT}	Gate trigger voltage	$T_C = 25\text{ }^{\circ}\text{C}$, $V_D = 12\text{ V}$, $R_L = 6\Omega$	-	-	3	V
V_{GD}	Gate non-trigger voltage	$T_C = 125\text{ }^{\circ}\text{C}$, $V_D = V_{DRM}$	0.3	-	-	V
V_{FGM}	Peak forward gate voltage	$T_C = 125\text{ }^{\circ}\text{C}$, square wave, $t = 3\text{ s}$, open circuit	-	-	12	V
V_{RGM}	Peak reverse gate voltage	$T_C = 125\text{ }^{\circ}\text{C}$, sine wave, $t = 3\text{ s}$, open circuit	-	-	5	V
I_{FGM}	Peak forward gate current	$T_C = 125\text{ }^{\circ}\text{C}$, square wave, $t = 3\text{ s}$, open circuit	-	-	4	A
P_{GM}	Gate power losses	$T_C = 125\text{ }^{\circ}\text{C}$, square wave, $t = 3\text{ s}$, open circuit	-	-	20	W
$P_{G(AV)}$	Gate power losses (mean)	$T_C = 125\text{ }^{\circ}\text{C}$, square wave, $t = 3\text{ s}$, open circuit	-	-	4	W

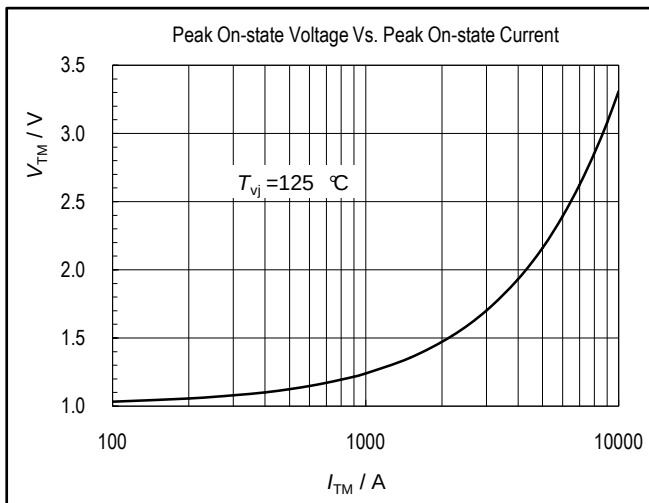


Fig1. Peak On-state Voltage Vs. Peak On-state Current

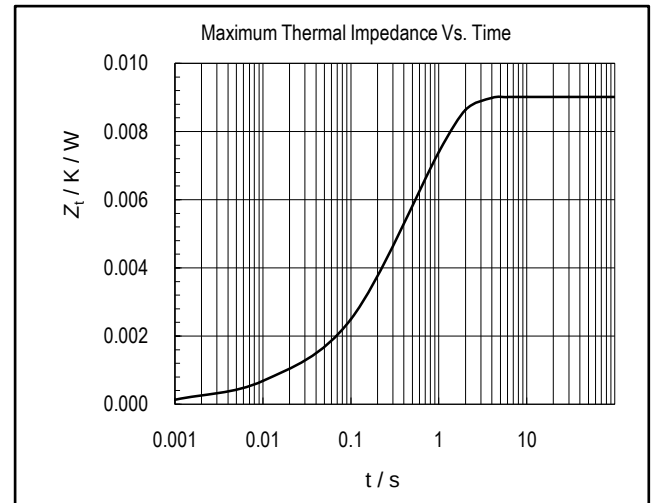


Fig2. Maximum Thermal Impedance Vs. Time

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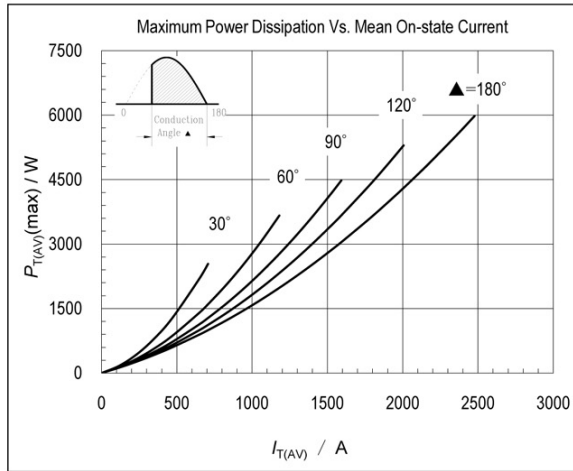


Fig3. Maximum Power Dissipation Vs. Mean On-state Current

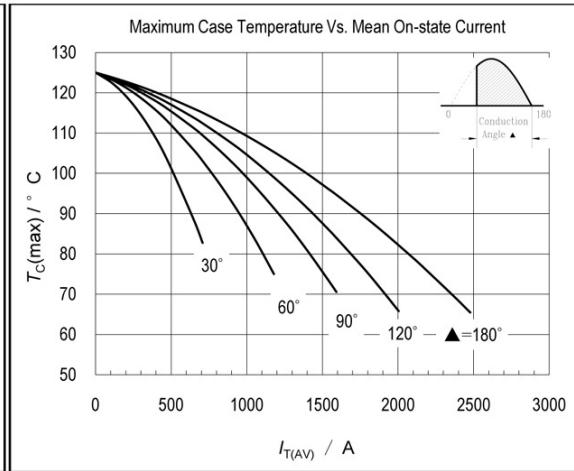


Fig4. Maximum Case Temperature Vs. Mean On-state Current

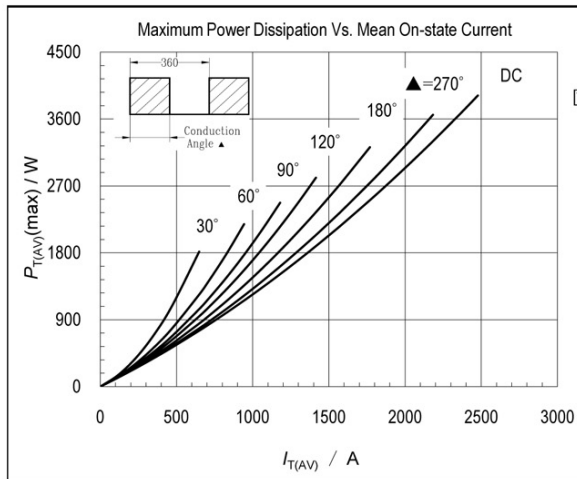


Fig5. Maximum Power Dissipation Vs. Mean On-state Current

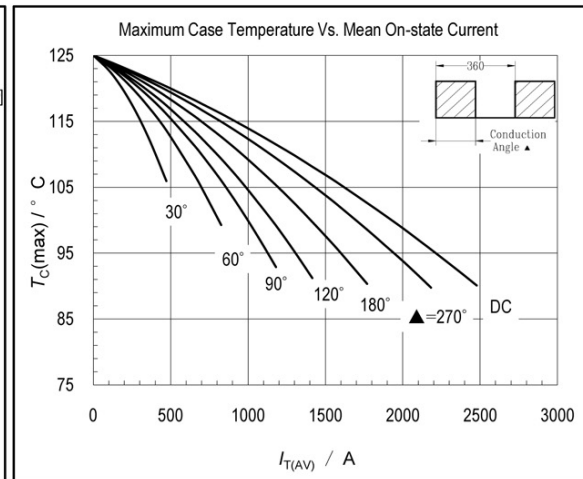


Fig6. Maximum Case Temperature Vs. Mean On-state Current

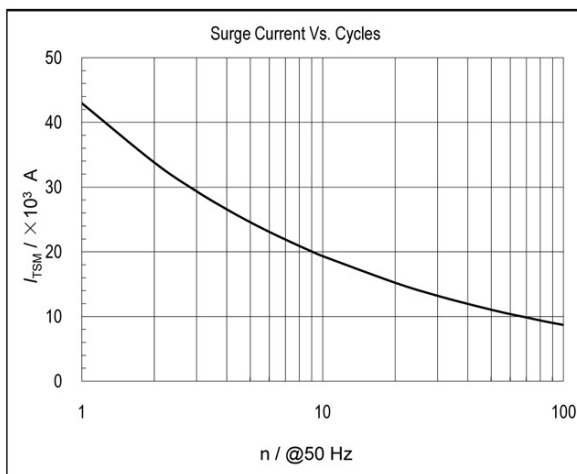


Fig7. Surge Current Vs. Cycles

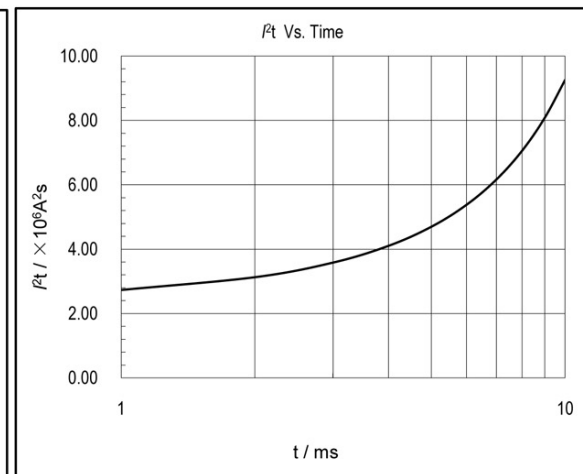
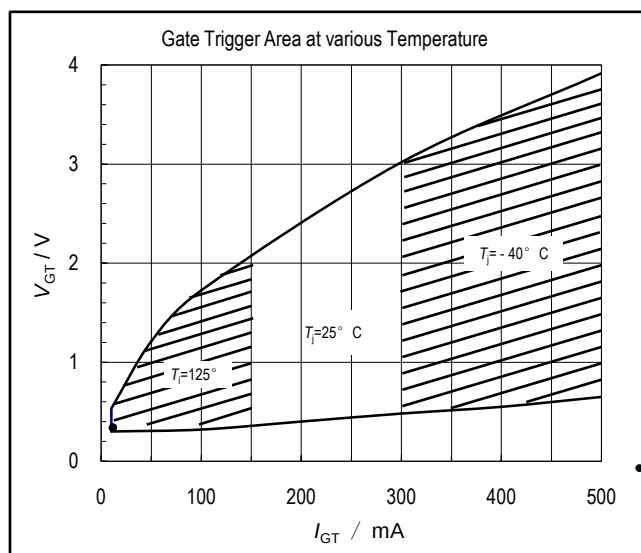
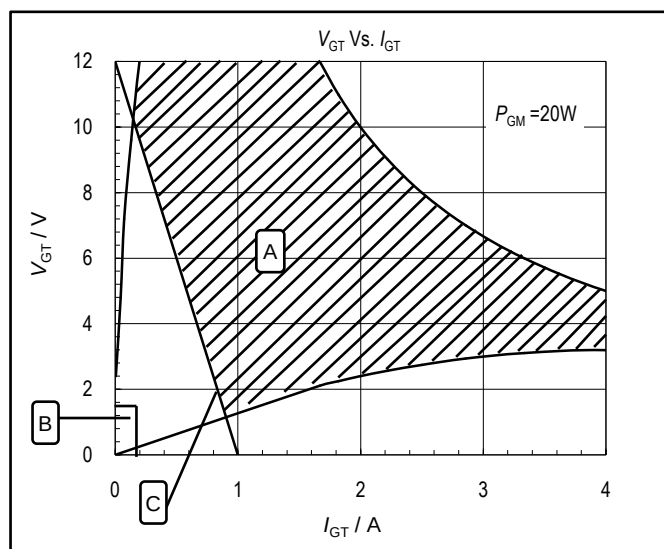


Fig8. I^2t Vs. Time

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A is Recommended Triggering Area.
B is Unreliable Triggering Area.
C is Recommended Gate Load Line.