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A Product Line of Diodes Incorporated | LITE-ON SEMICONDUCTOR

S12M15600B(LS)

SENSITIVE GATE SILICON CONTROLLED RECTIFIERS REVERSE BLOCKING THYRISTORS

SCRs 12 AMPERES RMA 600 VOLTS

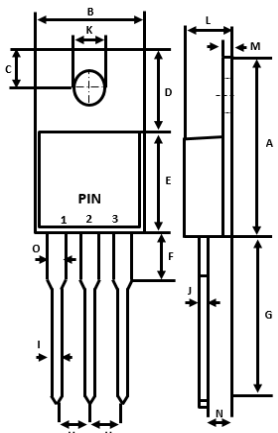
FEATURES

- Blocking Voltage to 600 Volts
- On-State Current Rating of 12 Amperes RMS at 80°C
- Rugged, Economical TO-220AB Package
- Glass Passivated Junctions for Reliability and Uniformity
- Minimum and Maximum Values of IGT, VGT and IH Specified for Ease of Design
- High Immunity to dv/dt – 100V/ms Minimum at 125°C
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

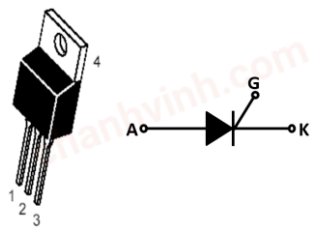
MECHANICAL DATA

- Package: TO-220AB
- Package Material: Molded Plastic
- Weight: 0.07 ounces, 2.0 grams

TO-220AB



TO-220AB		
Dim.	Min.	Max.
A	14.22	15.88
B	9.65	10.67
C	2.54	3.43
D	5.84	6.86
E	8.26	9.28
F	-	6.35
G	12.70	14.73
H	2.29	2.79
I	0.51	1.14
J	0.40	0.67
K	3.35 ϕ	4.09 ϕ
L	3.56	4.83
M	1.14	1.40
N	2.03	2.92
O	1.17	1.37
All Dimensions in millimeter		



PIN ASSIGNMENT	
1	Cathode
2	Anode
3	Gate
4	Anode

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

CHARACTERISTICS		SYMBOL	VALUE	UNIT
Peak Repetitive Off-State Voltage (T_J = -40°C to 125°C, Sine Wave, 50Hz to 60Hz; Gate Open)		V_{DRM} V_{RRM}	600	V
On-State RMS Current (180° Conduction Angles, T_C = 80°C)		$I_{T(RMS)}$	12	A
Peak Non-Repetitive Surge Current	(1/2 Cycle, Sine Wave, 60Hz, T_J = 25°C) (1/2 Cycle, Sine Wave, 50Hz, T_J = 25°C)	I_{TSM}	125 120	A
Circuit Fusing Consideration	(t = 8.3ms) (t = 10ms)	I^2t	64 72	A^2s
Forward Peak Gate Power (Pulse Width ≤ 1.0us, T_J = 80°C)		P_{GM}	5.0	W
Forward Average Gate Power (t = 8.3ms, T_C = 80°C)		$P_{G(AV)}$	0.5	W
Forward Peak Gate Current (Pulse Width ≤ 1.0us, T_C = 80°C)		I_{GM}	2.0	A
Operating Temperature Range		T_J	-40 to +125	°C
Storage Temperature Range		T_{STG}	-40 to +150	°C

Notes:

1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

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THERMAL CHARACTERISTICS

CHARACTERISTICS	SYMBOL	VALUE	UNIT
Thermal Resistance - Junction to Case - Junction to Ambient	RthJC RthJA	2.2 62.5	°C/W
Maximum Lead Temperature for Soldering Purposes 1/16" from Case for 10 Seconds	T_L	260	°C

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

OFF CHARACTERISTICS

CHARACTERISTICS		SYMBOL	MAX	UNIT
Peak Repetitive Forward or Reverse Blocking Current (V_D = Rated V_{DRM} and V_{RRM}; Gate Open)	T_J = 25° T_J = 125°C	I_{DRM} I_{RRM}	10 2.0	µA mA

ON CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN	TYP	MAX	UNIT
Peak Forward On-State Voltage (I_{TM} = 24A Peak, Pulse Width ≤ 2.0ms, Duty Cycle ≤ 2%)	V_{TM}	--	--	2.2	V
Gate Trigger Current (V_D = 12 V, R_L = 100 Ohms)	I_{GT}	2.0	8.0	15	mA
Holding Current (V_D = 12 V, Gate Open, Initiating Current = 200mA)	I_H	4.0	20	40	mA
Gate Trigger Voltage (V_D = 12V, R_L = 100 Ohms)	V_{GT}	0.5	0.65	1.0	V
Latch Current (V_D = 12V, I_G = 20mA)	I_L	6.0	25	60	mA

DANAMIC CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX	UNIT
Critical Rate of Rise of Off-State Voltage (V_D = Rated V_{DRM}, Exponential Waveform, Gate open, T_J = 125°C)	dv/dt	100	250	--	V/us
Repetitive Critical Rate of Rise of On-State Current (I_{PK} = 50A, P_W = 40us, di/dt = 1A/us, I_{GT} = 50mA)	di/dt	--	--	50	A/us

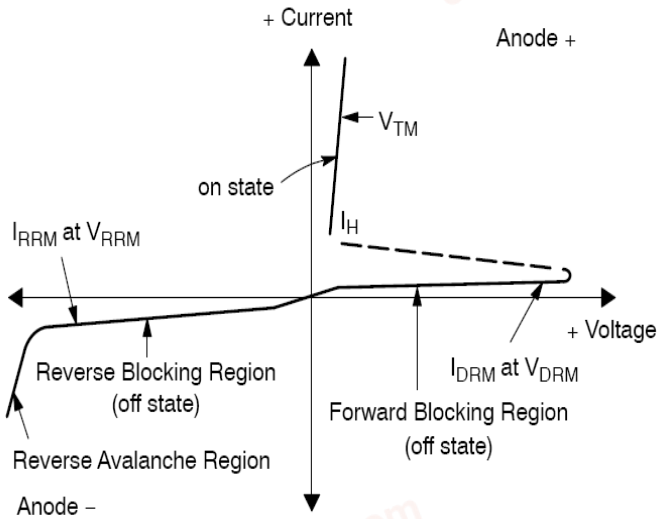
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RATING AND CHARACTERISTIC CURVES
S12M15600B

Voltage Current Characteristic of SCR

Symbol	Parameter
V_{DRM}	Peak Repetitive Off State Forward Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Off State Reverse Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Peak on State Voltage
I_H	Holding Current



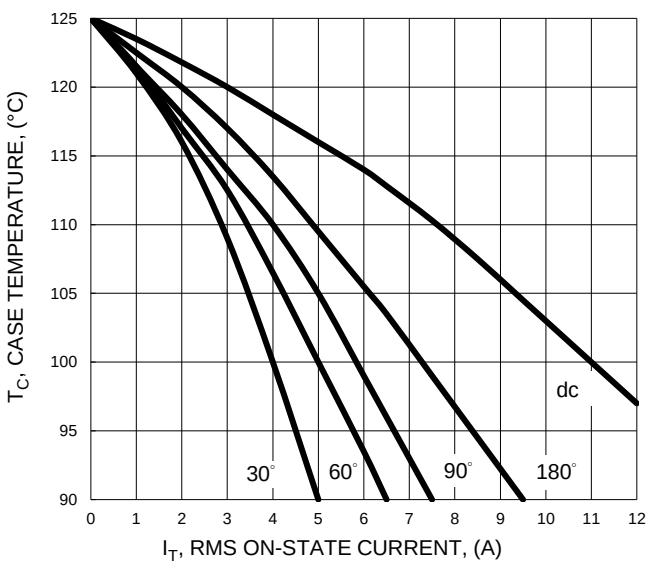


Figure 1. Typical RMS Current Dearting

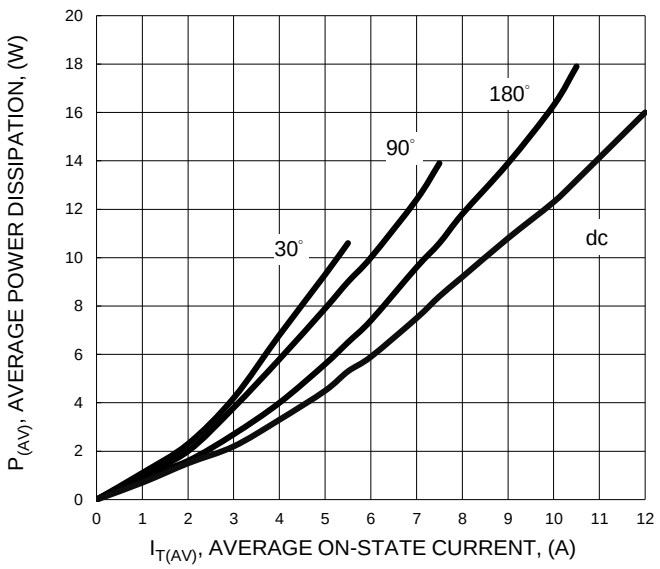


Figure 2. On-State Power Dissipation

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RATING AND CHARACTERISTIC CURVES
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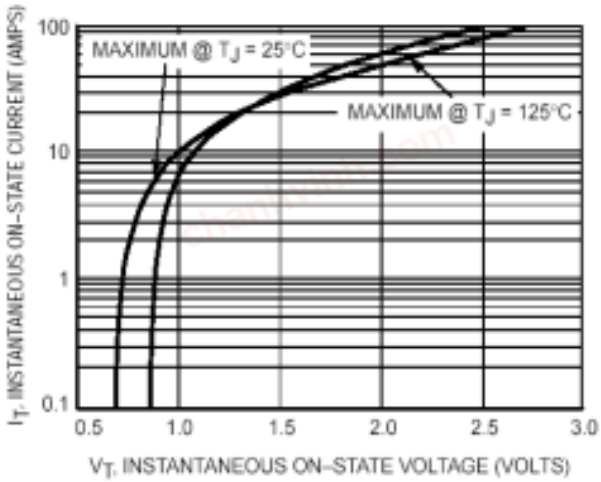


Figure 3. Typical On-State Characteristics

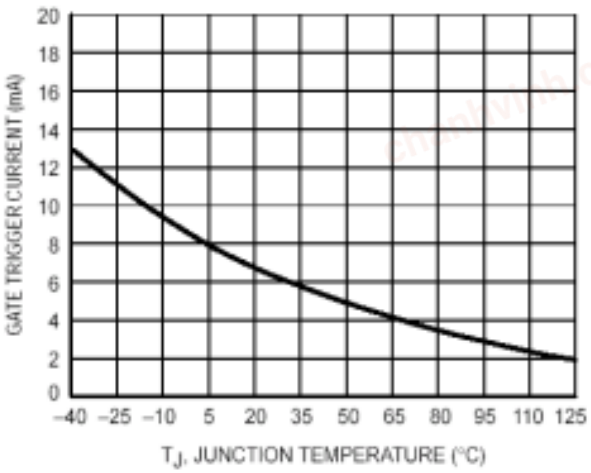


Figure 4. Typical Gate Trigger Current versus Junction Temperature

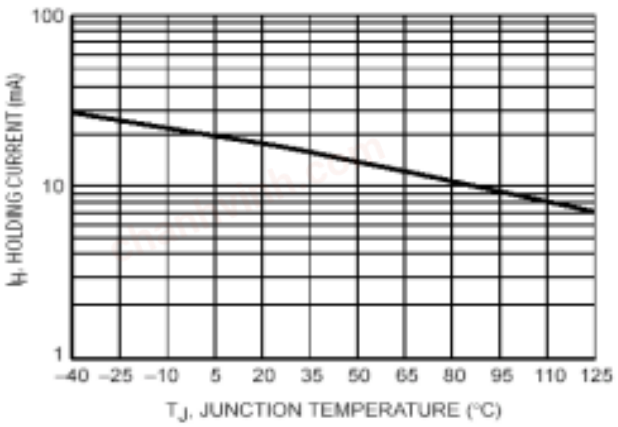


Figure 5. Typical Holding Current versus Junction Temperature

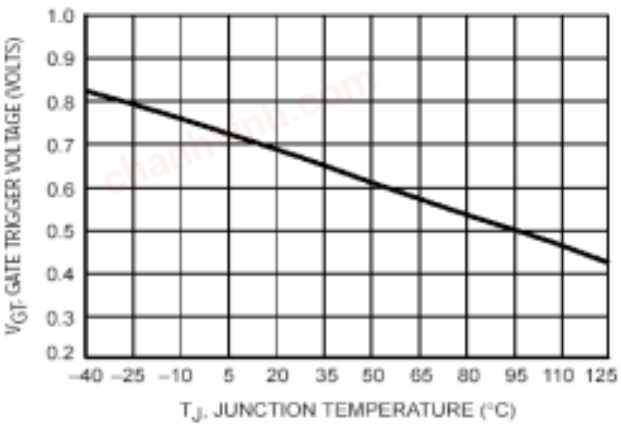


Figure 6. Typical Gate Trigger Voltage versus Junction Temperature

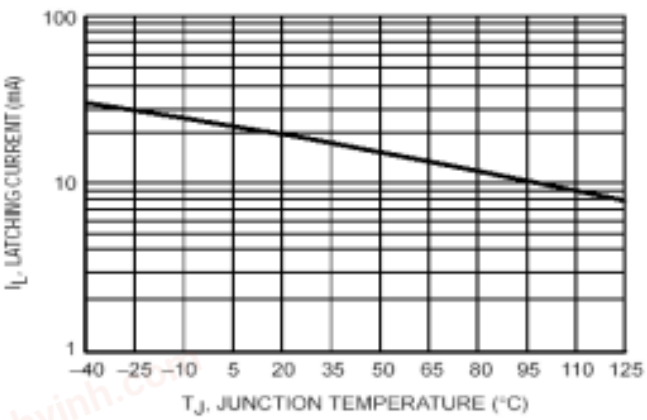


Figure 7. Typical Latching Current versus Junction Temperature

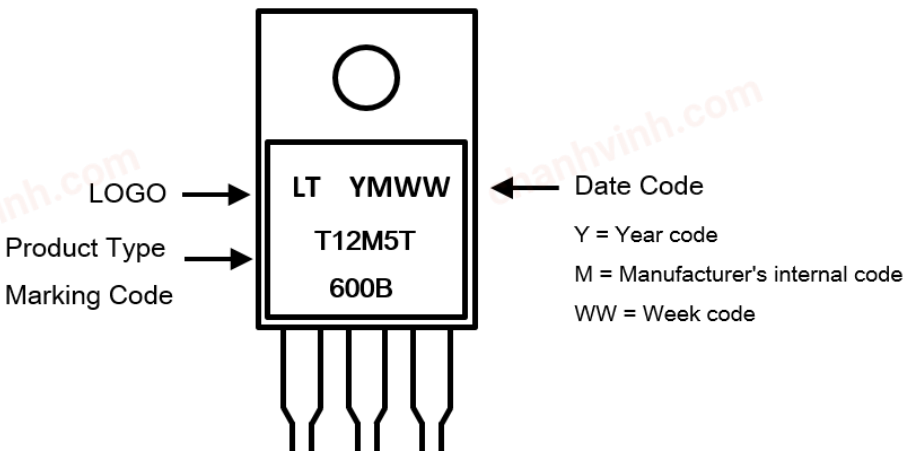
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Ordering Information:

Part Number	Package	Packing	
		Qty.	Carrier
S12M15600B	TO-220AB	50pcs	Tube

Marking Information:



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