T12M50T800HD(LS)

TRIACS
SILICON BIDIRECTIONAL THYRISTORS

TRIACS
12 AMPERES RMS
800V VOLTS

FEATURES

- Very high commutation performance
- Three-quadrants triggering triac
- Over 800V V_{DRM}/V_{RRM}
- Isolated mounting base
- High operating junction temperature
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

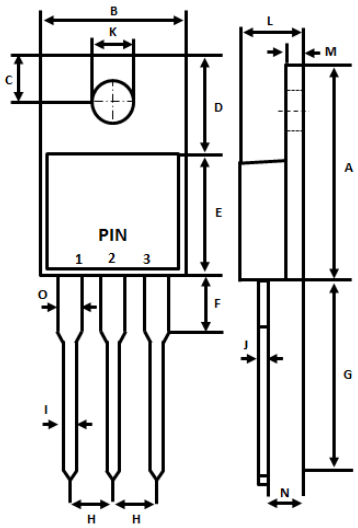
APPLICATIONS

- Solid state relays
- Non-linear rectifier-fed motor loads
- Electronic thermostats (heating and cooling)

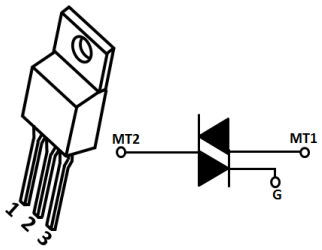
MECHANICAL DATA

- Package: TO-220AB Insulated
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 2.15 grams (Approximate)

TO-220AB Insulated



TO-220AB Insulated		
DIM.	MIN.	MAX
A	14.40	15.20
B	9.65	10.67
C	2.54	3.43
D	5.84	6.86
E	8.26	9.28
F	--	6.35
G	12.7	14.73
H	2.29	2.79
I	0.51	1.14
J	0.30	0.64
K	3.53Ø	4.09Ø
L	3.56	4.83
M	1.14	1.40
N	2.03	2.92
O	1.14	1.37
All dimensions in millimeter		



PIN ASSIGNMENT	
1	Main terminal 1
2	Main terminal 2
3	Gate

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at +25°C ambient temperature unless otherwise specified.

PARAMETER	SYMBOL	VALUE	UNIT
Peak repetitive off-state voltage (T_J = -40 to +150°C, full sine wave, 50 to 60Hz, gate open	V_{DRM} V_{RRM}	800 800	V
On-stage RMS current (full sine wave, T_C = +125°C)	$I_{T(RMS)}$	12	A
Peak non-repetitive surge current (full sine wave @ 50Hz, T_J = +25°C)	I_{TSM}	120	A
Circuit fusing consideration (t = 10ms)	I^2t	72	A^2s
Operating junction temperature range	T_J	-40 to +150	°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.

RATING AND CHARACTERISTIC CURVES
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OFF CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Peak repetitive forward or reverse blocking current @ T_J = +25°C (V_{AK} = rated V_{DRM} and V_{RRM}, gate open) @ T_J = +150°C	I_{DRM} I_{RRM}	5 2	µA mA

ON CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Peak forward on-state voltage (I_{TM} = 12A @ T_J = +25°C)	V_{TM}	1.5	V
Gate trigger current (V_{AK} = 12V, R_L = 100Ω)	$I_{GT}1$ $I_{GT}2$ $I_{GT}3$	50	mA
Gate trigger voltage (V_{AK} = 12V, R_L = 100Ω)	$V_{GT}1$ $V_{GT}2$ $V_{GT}3$	1.0	V
Holding current (V_{AK} = 12V, R_L = 100Ω)	I_H1 I_H3	60	mA
Latching current (V_{AK} = 12V, R_L = 100Ω)	I_L1 I_L2 I_L3	60 90 60	mA

DYNAMIC CHARACTERISTICS

PARAMETER		SYMBOL	MIN.	UNIT
Critical rate of rise of off-stage voltage (V_{AK} = 67% rated V_{DRM}, exponential waveform, gate open)	@ T_J = +125°C	dv/dt	2000	V/µs
	@ T_J = +150°C		1000	
Critical rate of rise of on-state current (V_{DRM} = maximum V_{DRM}, T_J = +25°C)		di/dt(s)	100	A/µs
Rate of change of commutating current (V_D = 400V, 20V/µs, T_J = +150°C)		di/dt(c)	8	A/ms

RATING AND CHARACTERISTIC CURVES
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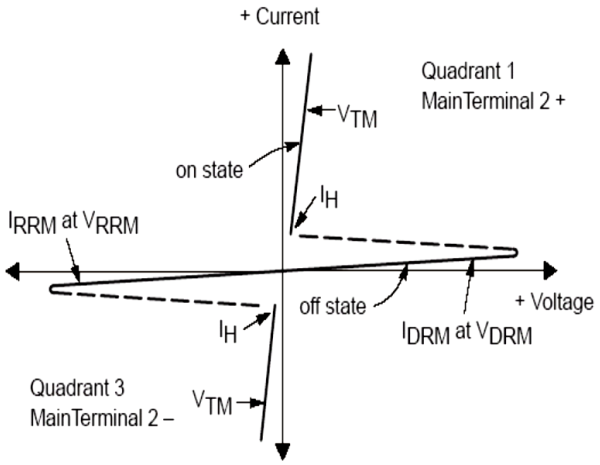
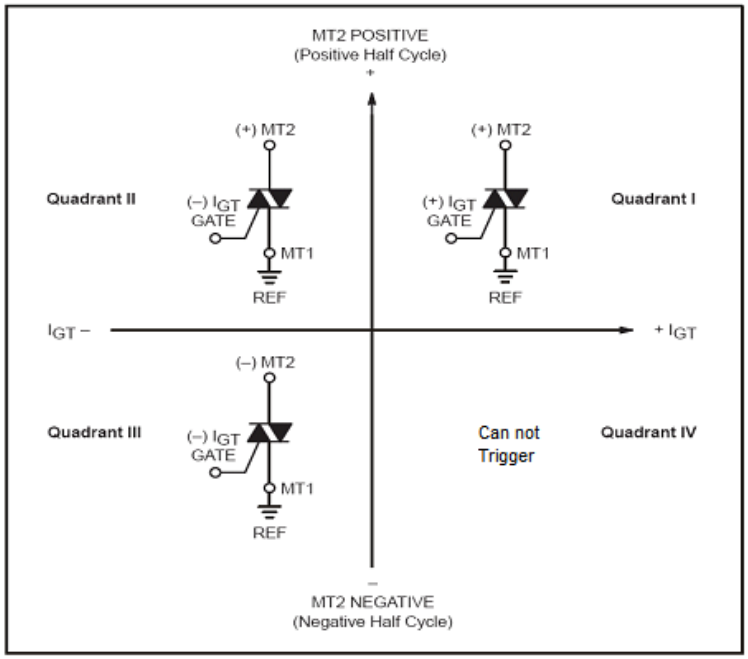
Symbol	Parameter
V_{DRM}	Peak Repetitive Forward Off State Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Reverse Off State Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Maximum On State Voltage
I_H	Holding Current





All polarities are reference to MT1,
with in-phase signal (using standard AC lines) quadrants I and III are used.

RATING AND CHARACTERISTIC CURVES
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FIG.1- Holding current variation

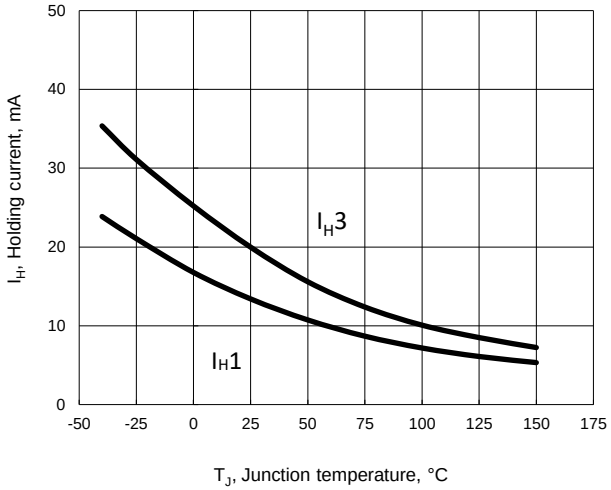

FIG.2- Gate trigger current variation

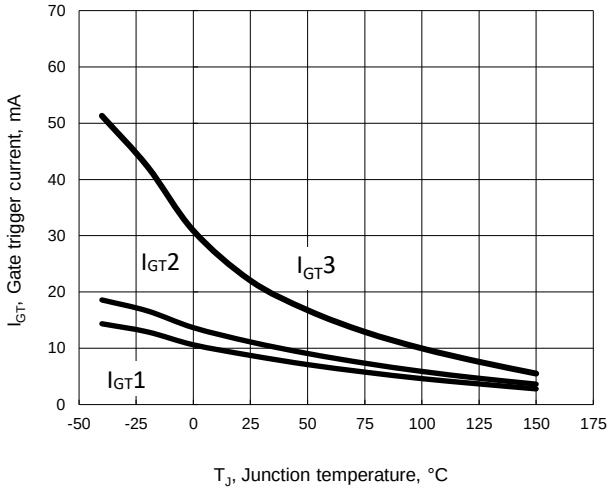

FIG.3- Gate trigger voltage variation

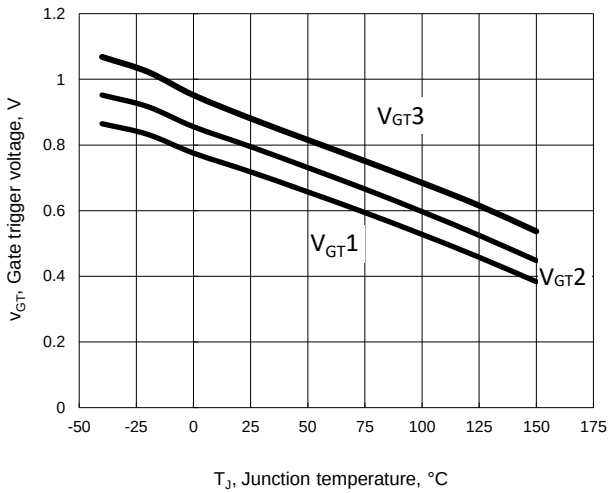

FIG.4- Typical latching current versus junction temperature

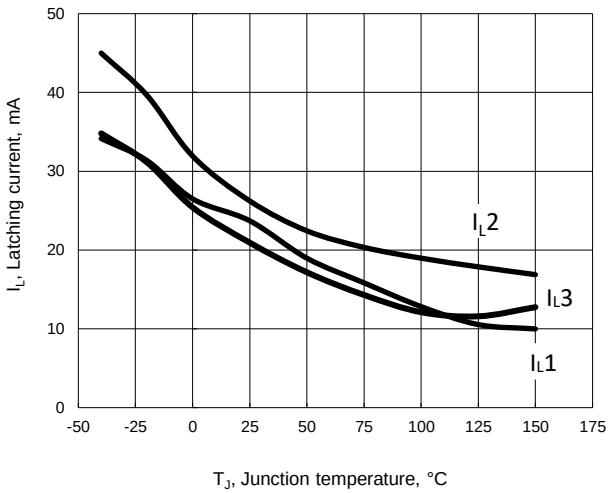

FIG.5- On-state characteristics

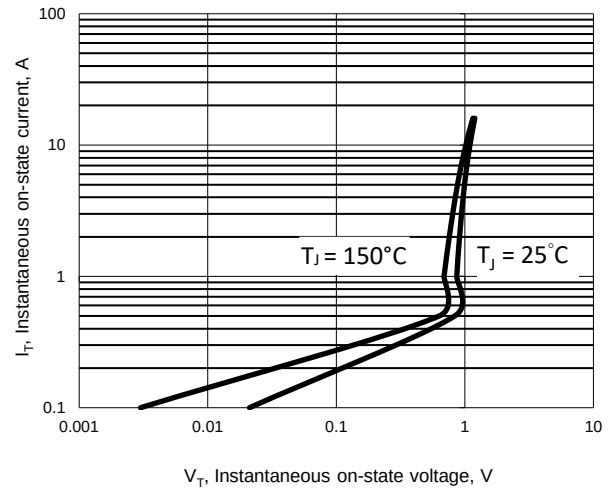

FIG.6- Power dissipation versus I_T

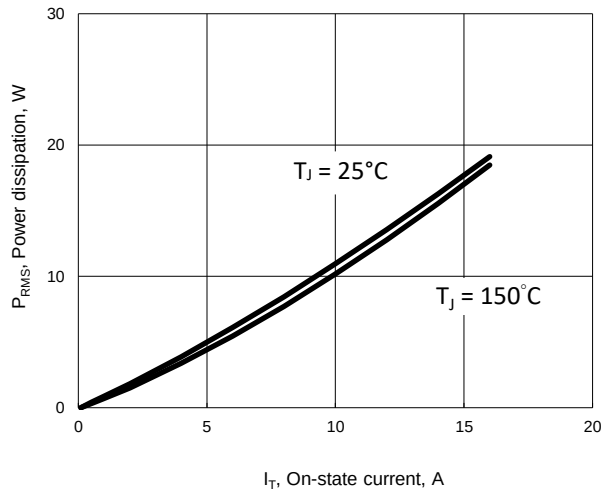

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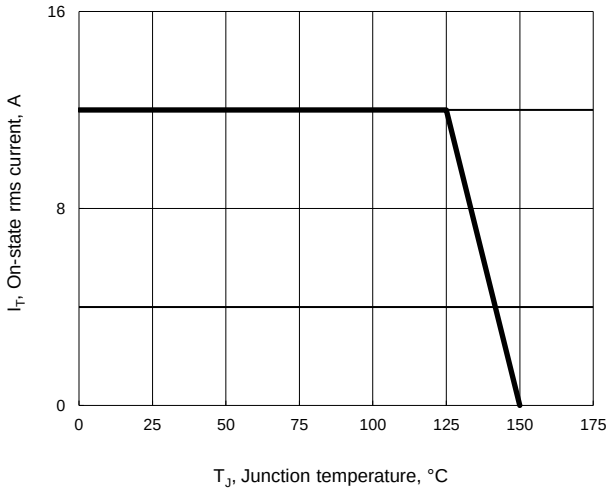
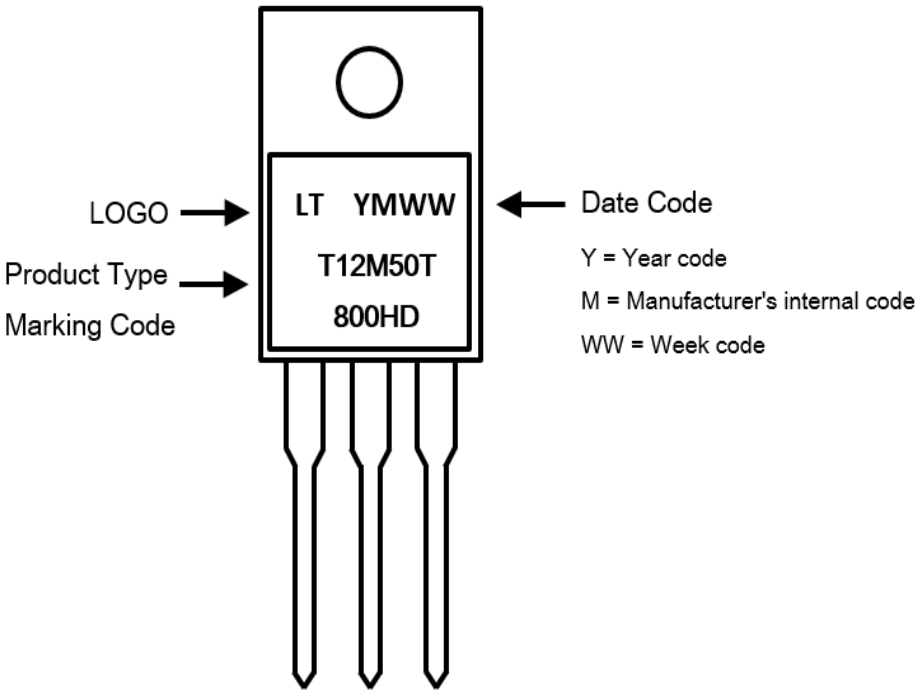
FIG.7- On-state current derating curve



Ordering Information:

Part Number	Package	Packing	
		Qty.	Carrier
T12M50T800HD	TO-220AB Insulated	50pcs	Tube

Marking Information:



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