

Product Summary

V_{DRM} V_{RRM}	$I_{T(RMS)}$	I_{GT}	T_J
800V	12A	10mA 35mA	+125°C

Mechanical Data

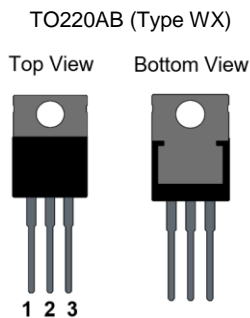
- Package: TO220AB
- Package Material: Molded Plastic, "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208
- Weight: 2.08 grams (Approximate)

Features

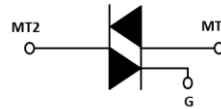
- Glass Passivated for Voltage Ruggedness and Reliability
- High Voltage Capability
- High Junction Operating Temperature Capability
- Triggering in Three Quadrants Only
- Internally Insulated Package
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**

Applications

- General-purpose motor controls
- Power control tools, electric drills, heating systems
- Home applications, fan controls, light dimmers, food processors, coffee machines



PIN ASSIGNMENT	
1	Main Terminal 1
2	Main Terminal 2
3	Gate



Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
T12M10T800UD	TO220AB (Type WX)	50pcs	Tube
T12M35T800UD	TO220AB (Type WX)	50pcs	Tube

- 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



T12MxxT800UD = Product Type Marking Code (xx = 10 or 35)
 J:: = Manufacturer's Code Marking
 Y = Last Digit of Year (ex: 3 = 2023)
 WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Test Conditions	Symbol	Value	Unit
Repetitive Peak Off-State Voltage	I _{DRM} , I _{RRM} = 5μA	V _{DRM} V _{RRM}	800	V
RMS On-State Current	T _J = +125°C	I _{T(RMS)}	12	A
Non-Repetitive Surge Peak On-State Current	Full cycle, t = 20ms, f = 50Hz	I _{TSM}	90	A
	Full cycle, t = 16.7ms, f = 60Hz		90	
I ² t Value for Fusing	t _P = 10ms	I ² t	40.5	A/μs
Rate of Rise of On-State Current	V _{AK} = V _{DRM}	di/dts	100	A/μs
Storage and Operating Junction Temperature		T _{STG} , T _J	-40 to +125	°C

ON Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Test Condition	Symbol	T12M10T800UD	T12M35T800UD	Unit
			Max	Max	
On-State Voltage	I _T = 12A, I _{GT} = 70mA	V _T	1.6	1.6	V
Gate Trigger Current	V _{AK} = 12V, R _L = 100Ω	I _{GT1} I _{GT2} I _{GT3}	10	35	mA
Holding Current	V _{AK} = 12V, R _L = 100Ω, I _{GT} = 70mA I _T = 100mA	I _{H1} I _{H3}	15	50	mA
Latching Current	V _{AK} = 12V, R _L = 100Ω, I _{GT} = 70mA	I _{L1}	25	50	mA
		I _{L1}	40	80	
		I _{L3}	25	50	
Gate Trigger Voltage	V _{AK} = 12V, R _L = 100Ω	V _{GT1} V _{GT2} V _{GT3}	1.5	1.5	V

Dynamic Electrical Characteristics (@T_J = +125°C, unless otherwise specified.)

Characteristic	Test Condition	Symbol	T12M10T800UD		T12M35T800UD		Unit
			Max	Min	Max	Min	
Rate of Rise of Off-State Voltage	V _D = 536V, gate open T _J = +125°C	dV/dt	40	—	2000	—	V/μs
Rate of Change of Commutating Current	Without snubber T _J = +125°C (dV/dt) _c = 10V/μs T _J = +125°C	(di/dt) _c	—	—	—	5	A/ms
			—	2.9	—	—	A/ms

OFF Characteristics

Characteristic	Test Condition	Symbol	Max	Unit
Forward and Reverse Leakage Current	Gate open, rated V _{DRM} and V _{RRM}	T _J = +25°C	5	μA
		T _J = +125°C	2	mA

Thermal Characteristics

Characteristic	Symbol	Typ	Unit
Thermal Resistance (Note 5)	R _{θJA}	6.9	°C/W
	R _{θJC}	2.3	
	R _{θJL}	2.2	

Note: 5. Thermal resistance junction to case, lead and ambient in accordance with JESD-51.
Unit mounted on aluminum pad 100mm x 42mm x 27mm fin type heatsink.

Rating and Characteristic Curves – T12M10T800UD

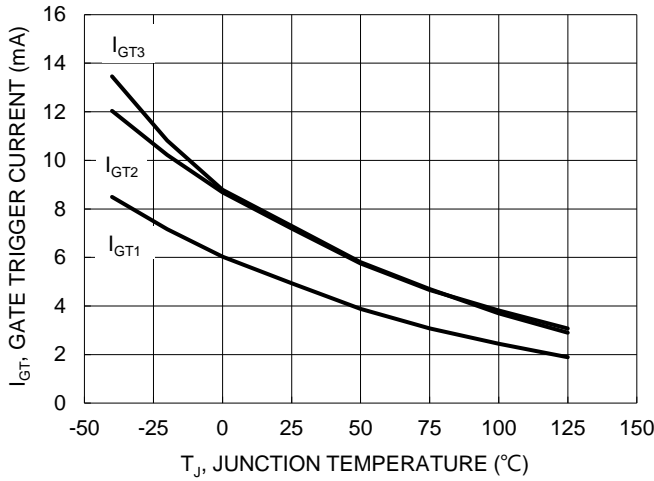


Figure 1. Typical Gate Trigger Current vs. Junction Temperature

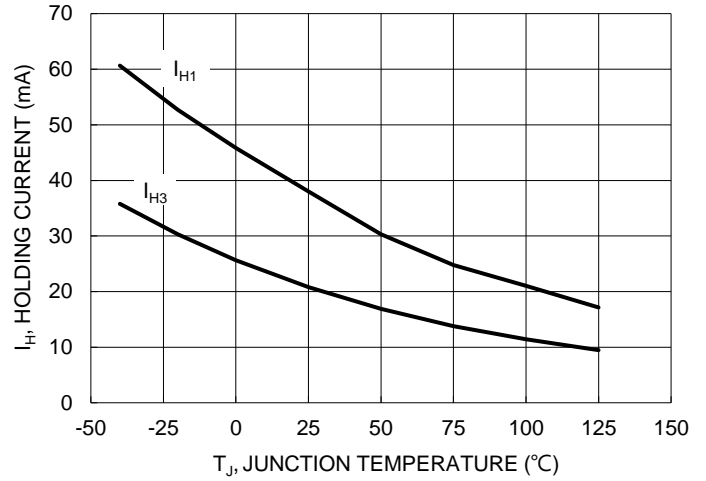


Figure 2. Typical Holding Current vs. Junction Temperature

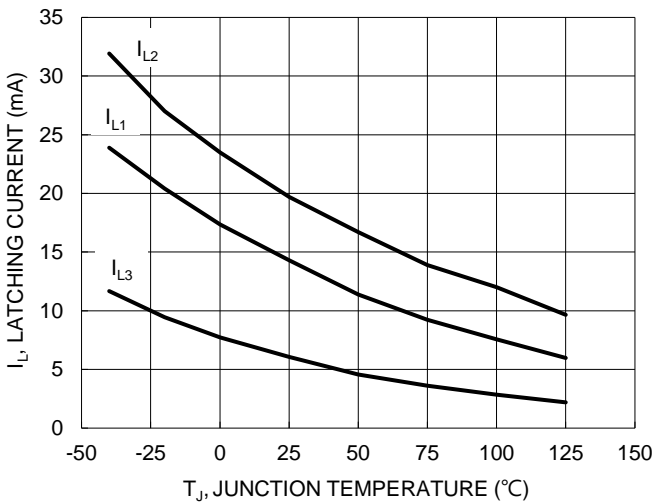


Figure 3. Typical Latching Current vs. Junction Temperature

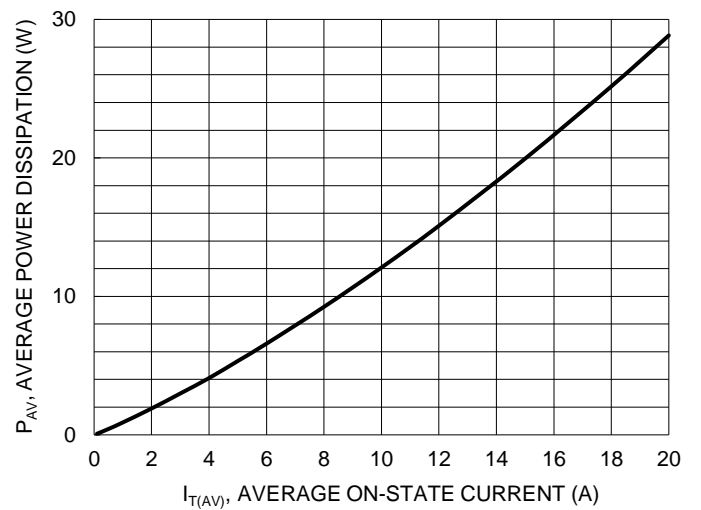


Figure 4. On-State Power Dissipation

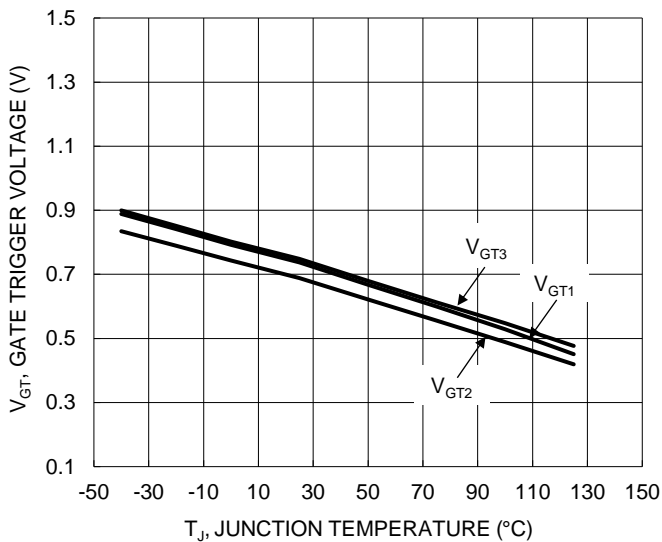


Figure 5. Typical Gate Trigger Voltage vs. Junction Temperature

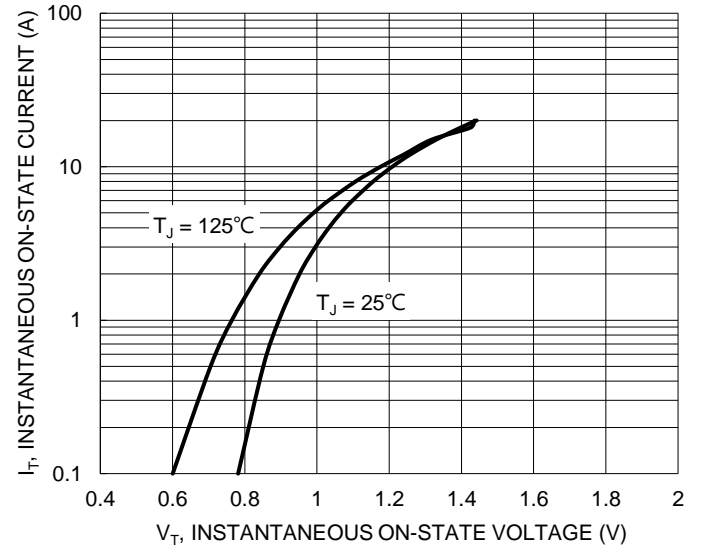


Figure 6. On-State Characteristics

Rating and Characteristic Curves – T12M35T800UD

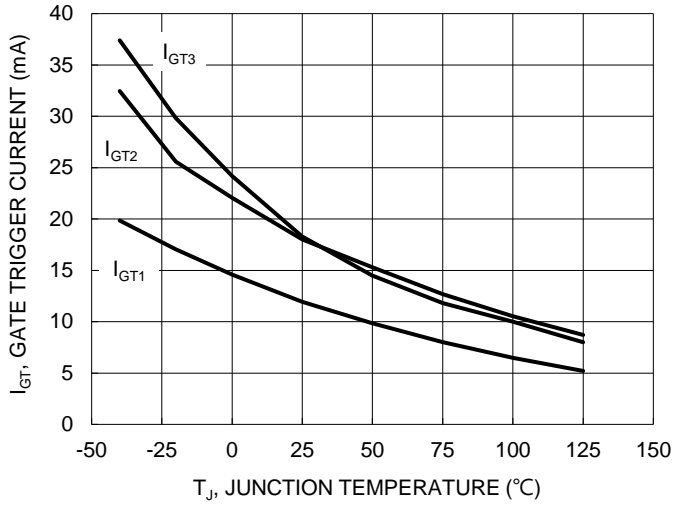


Figure 7. Typical Gate Trigger Current vs. Junction Temperature

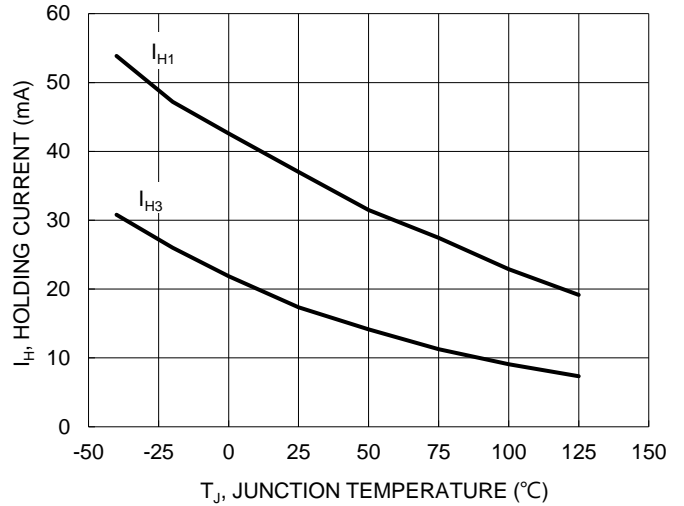


Figure 8. Typical Holding Current vs. Junction Temperature

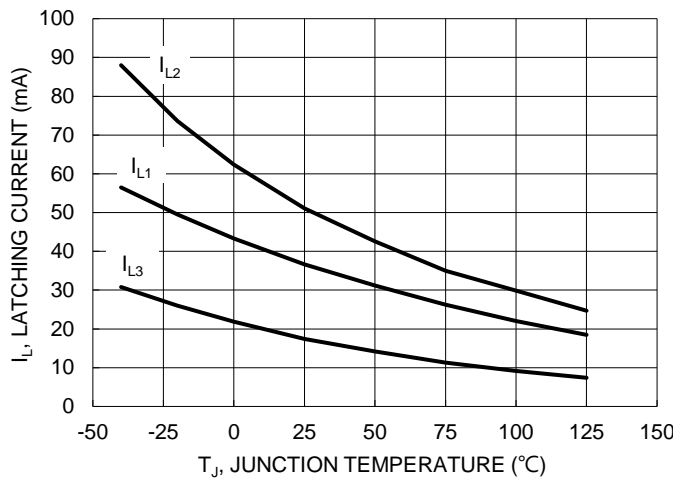


Figure 9. Typical Latching Current vs. Junction Temperature

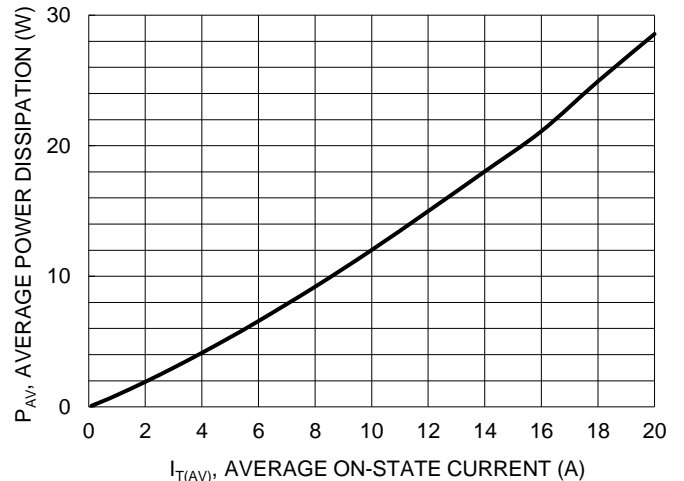


Figure 10. On-State Power Dissipation

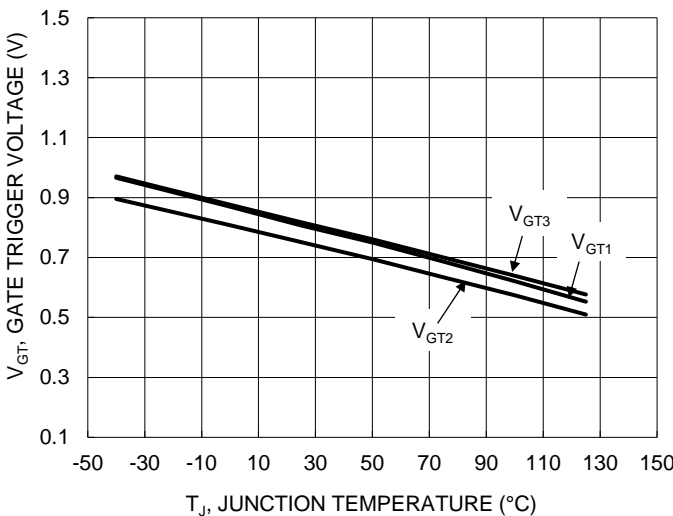


Figure 11. Typical Gate Trigger Voltage vs. Junction Temperature

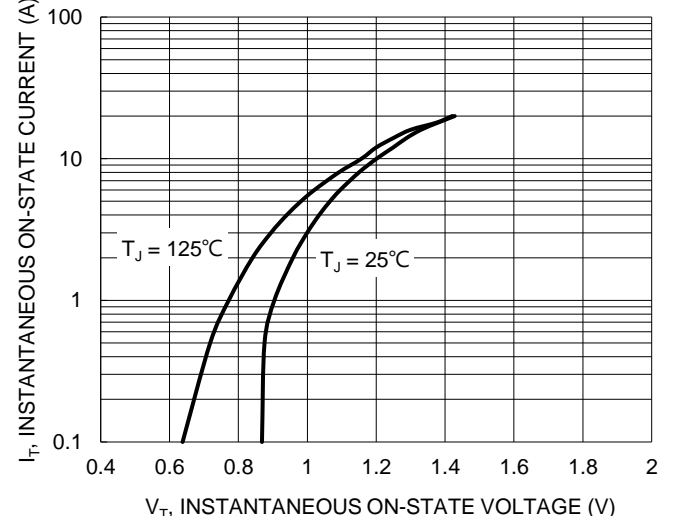
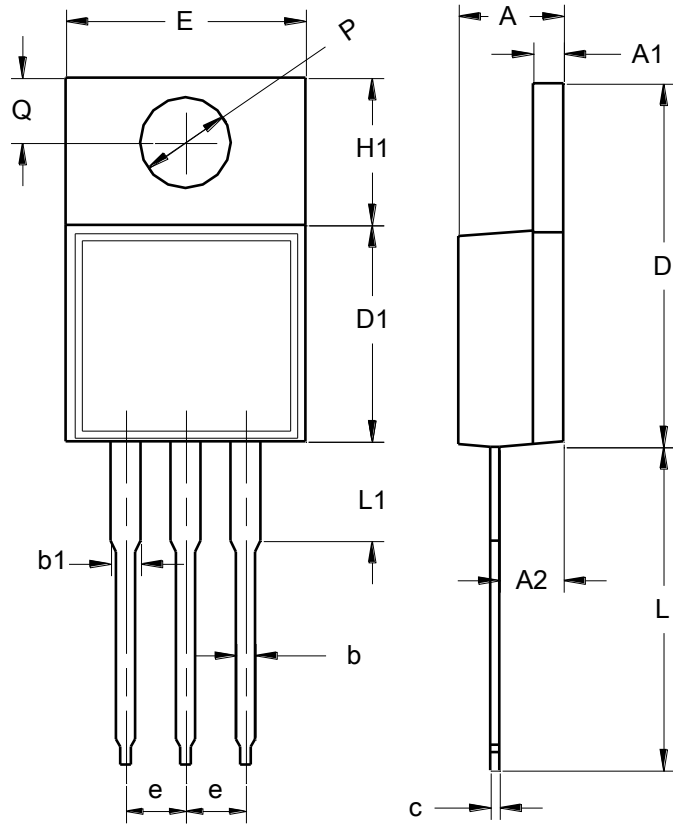


Figure 12. On-State Characteristics

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO220AB (Type WX)



TO220AB (Type WX)		
Dim	Min	Max
A	3.56	4.83
A1	1.14	1.40
A2	2.03	2.92
b	0.51	1.14
b1	1.14	1.70
c	0.30	0.64
D	14.40	15.20
D1	8.26	9.28
E	9.65	10.67
e	2.29	2.79
H1	5.84	6.86
L	12.70	14.73
L1	--	4.20
P \varnothing	3.53	4.09
Q	2.54	3.43
All Dimensions in mm		

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