W0405

SENSITIVE GATE SILICON CONTROLLED RECTIFIERS

MT Semiconductor®

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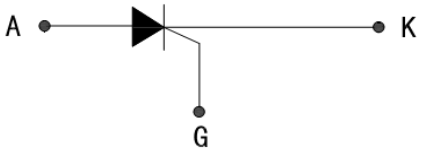
DESCRIPTION

PNPN devices designed for high volume, line-powered consumer applications such as relay and lamp drivers, small motor controls, gate drivers for larger thyristors, and sensing and detection circuits.

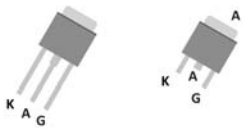
Simplified Schematic



FEATURES

- Sensitive gate allows triggering by micro controllers and other logic circuits
- Blocking voltage to 600V
- On-state current rating of 4.0A RMS at 80°C
- High surge current capability – 20A
- Minimum and maximum values of IGT, VGT and IH specified for ease of design
- Immunity to dV/dt – 10V/µsec minimum at 110°C
- Glass-passivated surface for reliability and uniformity

MARKING DIAGRAM & PIN ASSIGNMENT



TO-251 TO-252

ABSOLUTE MAXIMUM RATINGS (T_J = 25°C UNLESS OTHERWISE SPECIFIED)

Symbol	Parameter	Condition	Ratings	Units
V_{DRM}	Repetitive Peak Off-State Voltage		600	V
$I_{T(AV)}$	Average On-State Current	Half Sine Wave : T_C = 74 °C	2.5	A
$I_{T(RMS)}$	R.M.S On-State Current	All Conduction Angle	4.0	A
I_{TSM}	Surge On-State Current	1/2 Cycle,60Hz,Sine Wave Non-Repetitive	10	A
I^2t	I^2t for Fusing	t = 10.0ms	4.5	A^2S
P_{GM}	Forward Peak Gate Power Dissipation		1.0	W
$P_{G(AV)}$	Forward Average Gate Power Dissipation		0.2	W
I_{FGM}	Forward Peak Gate Current		1.2	A
T_J	Operating Junction Temperature		-40 ~ 110	°C
T_{STG}	Storage Temperature		-40 ~ 150	°C

THERMAL RESISTANCES

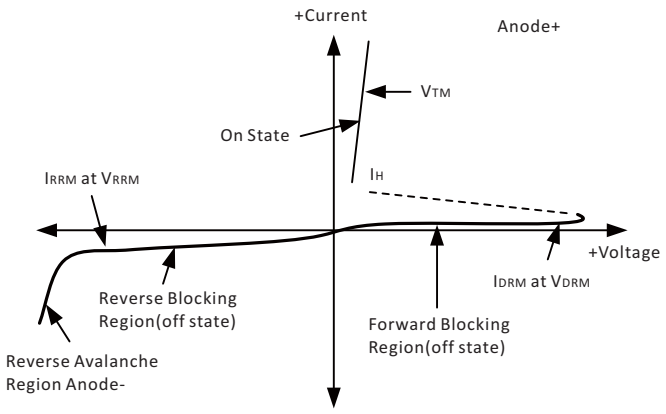
Symbol	Parameter		Value	Unit
Rth(j-c)	Junction to Case	TO-251	10	°C/W
		TO-252	15	°C/W
Rth(j-a)	Junction to Ambient	TO-251	100	°C/W
		TO-252	100	°C/W

ELECTRICAL CHARACTERISTICS (TC = 25 °C UNLESS OTHERWISE NOTED)

Symbol	Items	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I_{DRM}	Repetitive Peak Off-State Current	V_{AK} = V_{DRM} or V_{RRM} ; T_C = 25 °C T_C = 125 °C	— —	— —	5 100	uA
V_{TM}	Peak On-State Voltage	(I_T = 8 A, tp=380uS)	—	—	1.7	V
I_{GT}	Gate Trigger Current	V_D = 12V	—	—	200	uA
V_{GT}	Gate Trigger Voltage	V_D = 12V	—	—	0.8	V
V_{GD}	Non-Trigger Gate Voltage	V_D=V_{DRM}, R_{GK}=1000ohm,R_L=3.3Kohm, T_J = 110 °C	0.2	—	—	V
dv/dt	Critical Rate of Rise Off-State Voltage	V_D = 2/3 V_{DRM}, R_{GK} = 1000ohm, T_J = 110°C	10	—	—	V/uS
I_H	Holding Current	I_T = 0.05A	—	—	5.0	mA

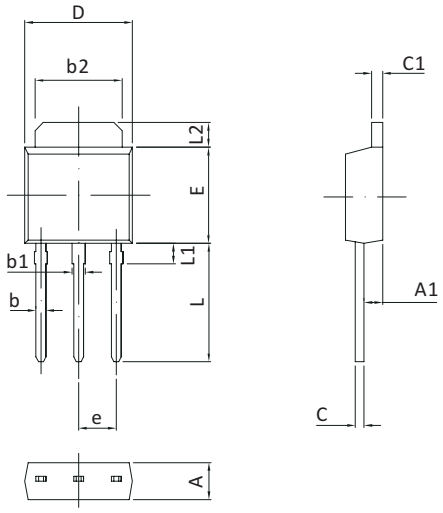
VOLTAGE CURRENT CHARACTERISTIC OF SCR

PARAMETER	SYMBOL
Peak Repetitive Off Stat Forward Voltage	V_{DRM}
Peak Forward Blocking Current	I_{DRM}
Peak Repetitive Off State Reverse Voltage	V_{RRM}
Peak Reverse Blocking Current	I_{RRM}
Peak On State Voltage	V_{TM}
Holding Current	I_H



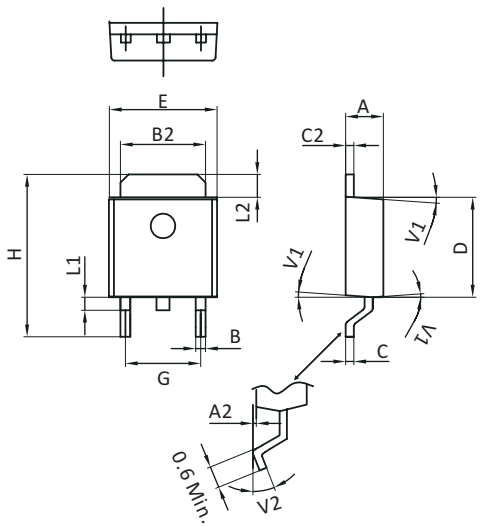
PACKAGE MECHANICAL DATA

TO-251(IPAK)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.10	2.40	0.083	0.094
A1	0.89	1.50	0.035	0.059
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
b2	5.20	5.40	0.205	0.213
C	0.46	0.61	0.018	0.024
C1	0.46	0.89	0.018	0.035
D	6.35	6.73	0.250	0.265
E	5.33	6.30	0.210	0.248
e	2.29TYP		0.09TYP	
L	6.50	7.90	0.256	0.311
L1	1.42	1.82	0.056	0.072
L2	1.35	1.65	0.053	0.065

TO-252(DPAK)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.40	0.086	0.095
A2	0.03	0.23	0.001	0.009
B	0.55	0.65	0.021	0.026
B2	5.10	5.40	0.200	0.212
C	0.45	0.62	0.017	0.024
C2	0.48	0.62	0.019	0.024
D	6.00	6.20	0.236	0.244
E	6.40	6.70	0.252	0.264
G	4.40	4.70	0.173	0.185
H	9.35	10.10	0.368	0.397
L1	0.80TYP		0.031TYP	
L2	1.37	1.50	0.05	0.06
V1	4° TYP		4° TYP	
V2	0°	8°	0°	8°

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