

DESCRIPTION

Designed for high current narrow-pulse switching applications where size and current handling capability are critical. These devices may be triggered on using low power logic drivers from (+0.8 V at 200 μ A).

Epoxy packaged, oxide passivated planar SCR chips with metallurgic bonds on both sides to achieve high reliability. Internal wire bond connection allows high current surge capability for narrow pulse applications.

KEY FEATURES

- Powermite 3[®] Package
- Small Mechanical Outline
- High speed switching capability
- Logic drive capability (0.8V, 200 μ A)
- UIS Rated Available with Lot Acceptance Testing
- Ideal for Laser Range finder and Camera Applications
- Ideal for Automotive Collision Avoidance Applications
- Available in 16mm Tape and Reel—6000 units/reel

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

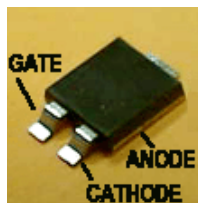
ABSOLUTE MAXIMUM RATINGS AT 25° C (UNLESS OTHERWISE SPECIFIED)

Rating	Symbol	Value	Unit
Repetative peak Off-State Voltage	V_{DRM}	125	V
Peak On-State Current	I_{TSM}	100	A
Peak Gate Current	I_{GM}	250	mA
Reverse Gate Voltage	V_{GR}	5	V
Storage Temperature Range	T_s	-50 to 150	°C
Operating Temperature Range	T_J	-25 to 125	°C

THERMAL CHARACTERISTICS (UNLESS OTHERWISE SPECIFIED)

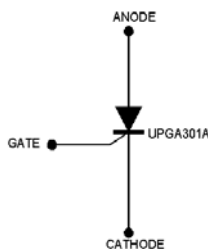
Thermal Resistance			
Junction-to Case (Anode)	R _J	4.0	°C/Watt

- (1) Mounted on 2" square by 0.06" thick FR4 board with a 1" x 1" square 2 ounce copper pattern.
(2) Mounted on 0.06" thick FR4 board, using recommended footprint.



Small foot print

 .100 X .160 inches
Foot print Area 16.51 mm²
1:1 Actual size (anode contact)



APPLICATIONS/BENEFITS

- Microsemi Corp DN14 design note

Nanosecond SCR switch for reliable high current pulse generators, modulators and photo-flash quenching.

Several new applications for nanosecond SCR switches include automotive collision avoidance systems, laser drivers, photo-flash quenching circuits, specially developed circuits for the emerging digital imaging range finders and communication markets.

ELECTRICAL PARAMETERS@25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
▶ On characteristics (up to 100 A w/ 100 ns pulse @ Duty Cycle = 0.0001% or less)						
Forward Blocking Current	I_{DRM}	$V_{DRM} = 100V, R_{GK} = 1k\Omega$			1.0	μA
On - State Voltage	V_T	$I_T = 1A, I_g = 10mA$		1.1	1.5	V
Gate Trigger Voltage	V_{GT}	$V_D = 5V, R_{GS} = 100\Omega$		0.5	0.75	V
Gate Trigger Current	I_{GT}	$V_D = 5V, R_{GS} = 10k\Omega$		2	20	μA
Reverse Gate Current	I_{GR}	$V_{GR} = 5V$		0.01	0.1	mA
Holding Current	I_H	$V_D = 5V, R_{GK} = 1k\Omega$	0.3	1.0	2.5	mA
Reverse Current (note 1)	I_{RRM}	$V_{RRM} = 30V, R_{GK} = 1k\Omega$		1	10	mA
▶ Switching characteristics ($T_c = 25^\circ C$)						
Delay Time	td	$I_g = 20 mA, I_T = 1A$		20	30	ns
Rise Time	tr	$V_D = 100V, I_T = 1A, I_g = 10mA$ DC < 1%		15	25	ns
Circuit Commutated Turn—off Time	tq	$I_T = I_R = 1A, R_{GK} = 1k\Omega$		0.3	0.5	μs
Gate Trigger—on Pulse Width	tpg(on)	$I_g = 10mA, I_T = 1A$		20	50	ns
Critical Rate of Rise Off –State Voltage	dv/dt	$V_D = 30V, R_{GK} = 1k\Omega$	15	30		V/ μs

Note 1: Pulse Test intended to guarantee reverse anode voltage capability for pulse commutation.

SPICE MODEL

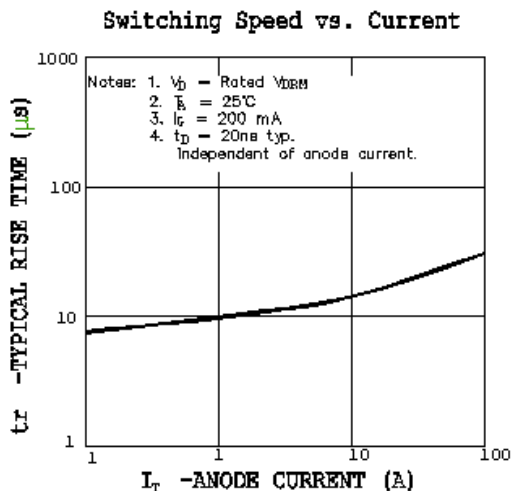
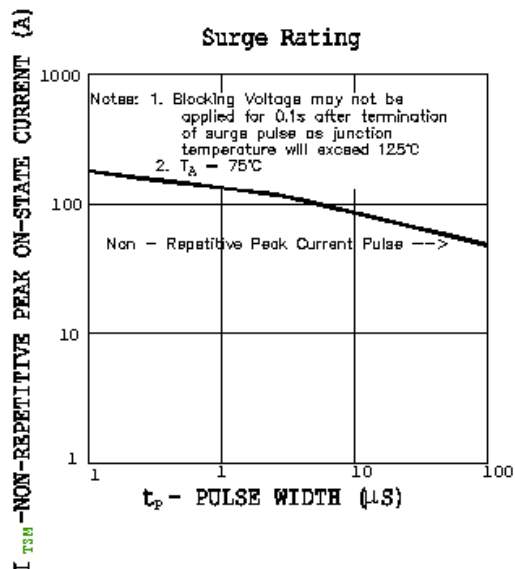
.subckt SCR anode gate cathode PARAMS:

* Powermite 3 UPGA301A high-speed thyristor

+Vdrm=125V Vrrm=30V Idm=1 μA lh=5mA
 +dvdt=7E5V/s lgt=200 μA Vgt=0.75V Vtm=1.5V
 +ltm=2A ton=55ns toff=500ns

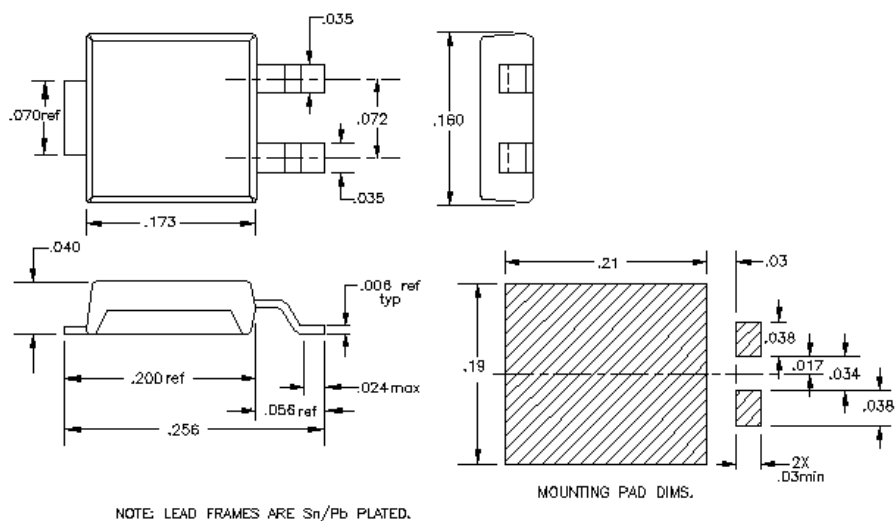
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Case: Molded Epoxy
Meets UL94VO at 1/8 inch
Weight: 72 milligrams
Lead and Mounting Temperature: 260°C max for 10 seconds

NOTE: All dimensions are in inches.



PACKAGE DATA



PRELIMINARY

UPGA301A

Nanosecond SCR SWITCH

PRODUCT PREVIEW

NOTES:

www.Microsemi.com

NOTES