

**DESCRIPTION**

The UPGA301Ae3 is 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  $\mu$ 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**

- Very low thermal resistance package
- Efficient heat path with integral locking bottom metal tab
- Full metallic bottom eliminates flux entrapment
- RoHS Compliant with e3 suffix
- High speed switching capability
- Compatible with high-speed insertion
- Low profile height of 1 mm

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

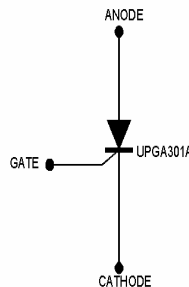
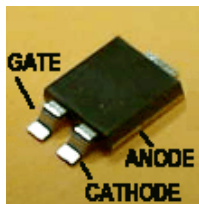
**ABSOLUTE MAXIMUM RATINGS AT 25° C  
(UNLESS OTHERWISE SPECIFIED)**

Rating	Symbol	Value	Unit
Repetative peak Off-State Voltage	$V_{DRM}$	100	V
Peak On-State Current for 50 ns (max)	$I_{TSM}$	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	$T_J$	0 to 125	°C


**THERMAL CHARACTERISTICS  
(UNLESS OTHERWISE SPECIFIED)**

Thermal Resistance			
Junction-to-Case (Anode Bottom)	$R_{\theta JC}$	4.0	°C/Watt
Junction-to-Ambient (1)	$R_{\theta JA}$	65	°C/Watt

(1)When mounted on 0.06" thick FR4 board with 2 oz copper FR4 board with recommended footprint



Small foot print

 .190 X .270 inches

1:1 Actual size

See mounting pad details on pg 3

**APPLICATIONS/BENEFITS**

- Reference Microsemi MicroNote 601 and 602
- Nanosecond SCR switch for reliable high current pulse generators, modulators and photo-flash quenching
- Logic drive capability (0.8V, 200 $\mu$ A)
- Ideal for Laser Range finder and Camera Applications
- Ideal for Automotive Collision Avoidance Applications

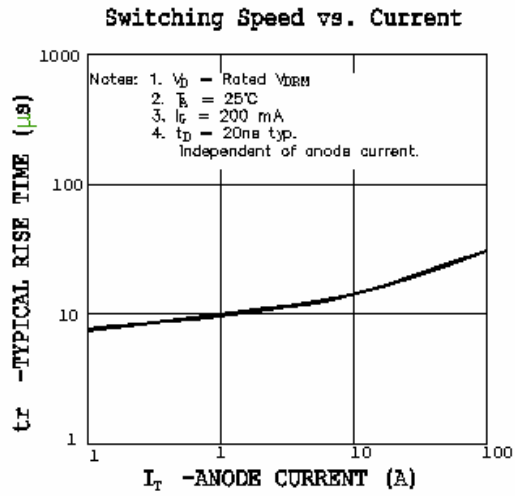
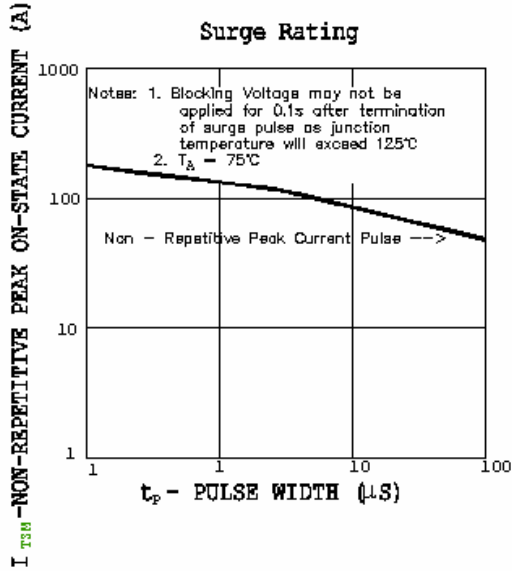
**MECHANICAL & PACKAGING**

- CASE: Void-free transfer molded thermosetting epoxy compound meeting UL94V-0
- FINISH: Annealed matte-Tin plating over copper and readily solderable per MIL-STD-750 method 2026 (consult factory for Tin-Lead plating)
- POLARITY: See figure (left)
- MARKING: 301A•
- WEIGHT: 0.072 gram (approx.)
- Package dimensions on last page
- Tape & Reel option: 16 mm tape per Standard EIA-481-B, 5000 on 13" reel

**ELECTRICAL PARAMETERS@25°C (unless otherwise specified)**

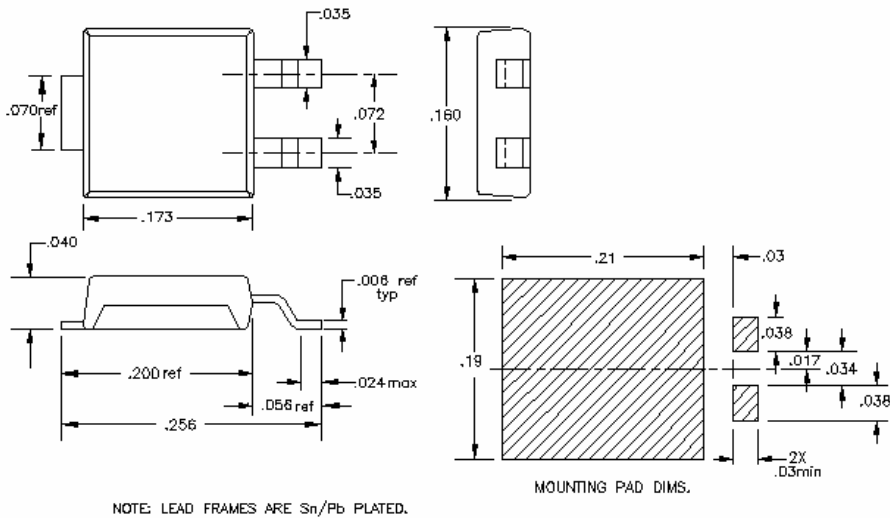
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
<b>► On characteristics (up to 100 A w/ 100 ns pulse @ Duty Cycle = 0.0001% or less)</b>						
Forward Blocking Current	$I_{DRM}$	$V_{DRM} = 100\text{ V}, R_{GK} = 1\text{ k}\Omega$			1.0	$\mu\text{A}$
On - State Voltage	$V_T$	$I_T = 1\text{ A}, I_g = 10\text{ mA}$		1.1	1.5	V
Gate Trigger Voltage	$V_{GT}$	$V_D = 5\text{ V}, R_{GS} = 100\ \Omega$		0.5	0.75	V
Gate Trigger Current	$I_{GT}$	$V_D = 5\text{ V}, R_{GS} = 10\text{ k}\Omega$		10	200	$\mu\text{A}$
Reverse Gate Current	$I_{GR}$	$V_{GR} = 5\text{ V}$		0.01	0.1	mA
Holding Current	$I_H$	$V_D = 5\text{ V}, R_{GK} = 1\text{ k}\Omega$	1.0	3.0	5.0	mA
Reverse Current (Note 1)	$I_{RRM}$	$V_{RRM} = 30\text{ V}, R_{GK} = 1\text{ k}\Omega$		1	10	mA
<b>► Switching characteristics (<math>T_c = 25\text{ }^\circ\text{C}</math>)</b>						
Delay Time	td	$I_g = 20\text{ mA}, I_T = 1\text{ A}$		20	30	ns
Rise Time	tr	$V_D = 60\text{ V}, I_T = 1\text{ A}, I_g = 10\text{ mA}$ dc < 1%		15	25	ns
Circuit Commutated Turn—off Time	tq	$I_T = 1.0\text{ A}, I_R = 1.0\text{ A max},$ $R_{GK} = 1\text{ k}\Omega$		0.3	0.5	$\mu\text{s}$
Gate Trigger—on Pulse Width	tpg(on)	$I_g = 10\text{ mA}, I_T = 1\text{ A}$		20	50	ns
Critical Rate of Rise Off –State Voltage	dv/dt	$V_D = 30\text{ V}, R_{GK} = 1\text{ k}\Omega$	15	30		V/ $\mu\text{s}$

Note 1: Pulse Test intended to guarantee reverse anode voltage capability for pulse commutation. The device should not be operated in the reverse blocking mode on a continuous basis



Case: Molded Epoxy  
Meets UL94V-O 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**



**UPGA301Ae3**

**Nanosecond SCR SWITCH**

NOTES:

www.Microsemi.com

NOTES