DUT1508 – 800V, 15A

August 2009

Preliminary

Mintech

HIGH EFFICIENCY, TEMPERATURE INDEPENDENT GaAs RECTIFIER DIODE

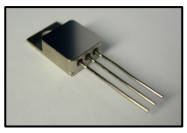
General Description

The DUT1508 is a GaAs P-I-N Rectifier. It uses a patented liquid phase epitaxy (LPE) construction to provide temperature performance above current Silicon, Silicon Carbide and Gallium Nitride products of a similar specification. The device is able to function stably well above the maximum T_J of more traditional diodes of this type while maintaining parity of performance in terms of key parameters such as recovery time and forward voltage.

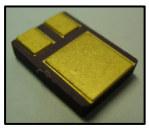
Features

- High maximum junction temperature; up to +260°C vs. +175°C for silicon diodes
- Lower and **temperature independent** dynamic recovery characteristics over the full specified temperature range
- Lower leakage current at all operating temperatures
- Very low capacitance

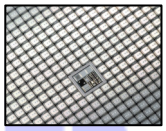
Package Types



TO-257



TO-276AB (SMD)



BARE DIE

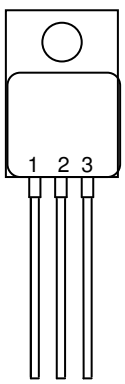
Applications

- High temperature electronics
- Power Modules
- Hybrid circuits

Thermal Characteristics

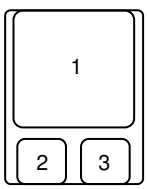
SYMBOL	PARAMETER	PACKAGE	RATINGS	UNITS
$R_{\theta JC}$	MAXIMUM THERMAL RESISTANCE, JUNCTION TO CASE	TO-276AI	3.51	°C/W
$R_{\theta JC}$	MAXIMUM THERMAL RESISTANCE, JUNCTION TO CASE	TO-257AIN	1.45	°C/W
$R_{\theta JC}$	MAXIMUM THERMAL RESISTANCE, JUNCTION TO CASE	TO-276AB	1.24	°C/W

TO-257AI / TO-257AIN



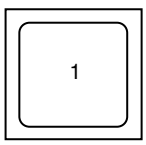
1 CATHODE
2 ANODE
3 CATHODE

TO-276AB



1. ANODE
2. COMMON CATHODE
3. COMMON CATHODE

BARE DIE (3.1mm²)



1. CATHODE
2. ANODE (DIE BACKSIDE)

ORDERING PART #	PACKAGE	TEMP RANGE
DUT1508AL	TO-257AI	-65 TO 260°C
DUT1508ALN	TO-257AIN	-65 TO 260°C
DUT1508S	TO-276AB	-65 TO 260°C
DUT1508-AG	BARE DIE	-65 TO 260°C
DUT1508-GG	BARE DIE	-65 TO 260°C

Europe: sales@mintech.co.uk
USA : ussales@mintech.co.uk
China: chinasales@mintech.co.uk

Absolute Maximum Ratings

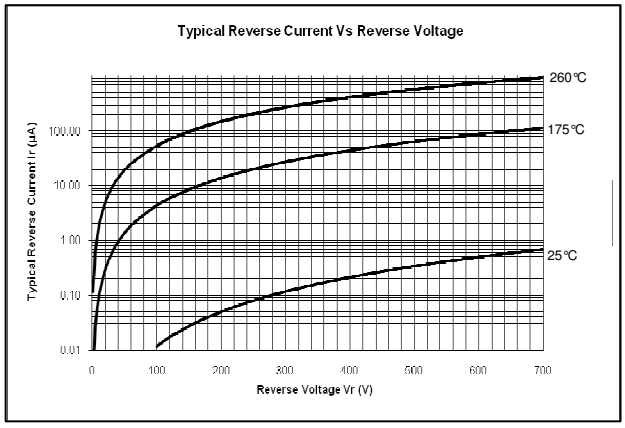
SYMBOL	PARAMETER	RATINGS	UNITS
V_{RRM}	PEAK REPETETIVE REVERSE VOLTAGE	800	V
V_{RWM}	WORKING PEAK REPETETIVE REVERSE VOLTAGE	800	V
V_R	DC BLOCKING VOLTAGE	800	V
$I_{F(AV)}$	AVERAGE RECTIFIED FORWARD CURRENT @ 260℃	15	A
I_{FSM}	NON-REPETETIVE PEAK SURGE CURRENT 60Hz SINGLE HALF-SINE WAVE	150	A
T_J ,T_{STG}	OPERATING AND STORAGE TEMPERATURE RANGE	-65 to +260	℃

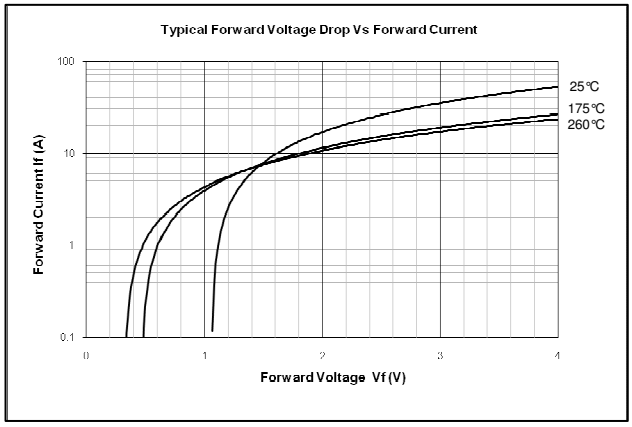
Electrical Characteristics

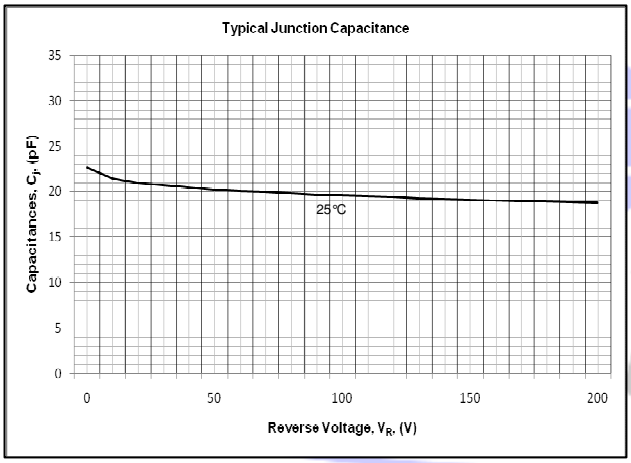
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS
$V_{FM}1$	I_F=15A	T_C = 25℃ T_C = 175℃ T_C = 260℃	- - -	1.8 2.1 2.3	1.9 2.2 2.5	V
$I_{RM}1$	V_R=800V	T_C = 25℃ T_C = 175℃ T_C = 260℃	- - -	0.40 125 1000	1 130 1100	µA
t_{RR}	I_F=1A, di/dt = 200 A/µs, V_R=30V	T_C = 25℃ T_C = 175℃ T_C = 260℃	- - -	30 30 30	35 35 35	ns
t_{RR} I_{RR} Q_{RR}	I_F=15A, di/dt = 200 A/µs, V_R=200V	T_C = 25℃	- - -	65 9 300	75 10 370	ns A nC
t_{RR} I_{RR} Q_{RR}	I_F=15A, di/dt = 200 A/µA, V_R=200V	T_C = 175℃	- - -	65 9 300	75 10 370	ns A nC
t_{RR} I_{RR} Q_{RR}	I_F=15A, di/dt = 200 A/µA, V_R=200V	T_C = 260℃	- - -	65 9 300	75 10 370	ns A nC
C_J	T_J= 25℃, f = 1MHz, V_R = 200V	-	-	18	22	pF
W_{AVL}	AVALANCHE ENERGY (L=2Mh)	-	10	-	-	mJ

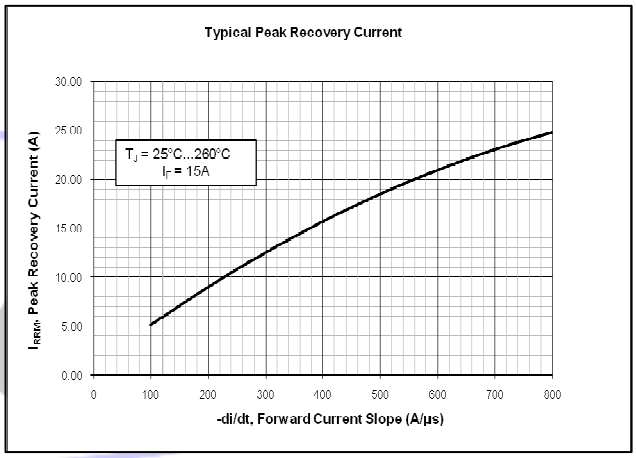
Notes:
1: Pulse: Test Pulse width = 300µs, Duty Cycle = 2%

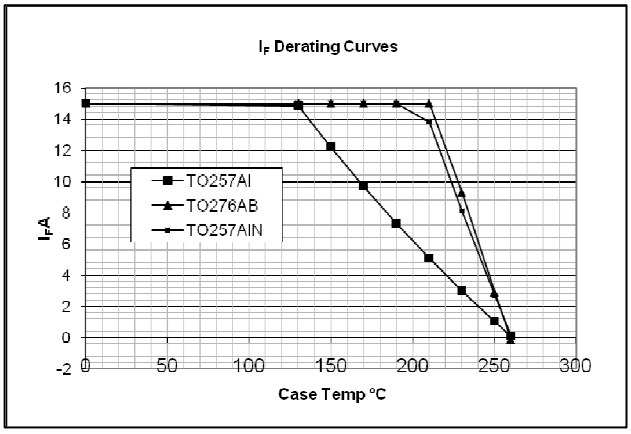
Typical Performance Characteristics

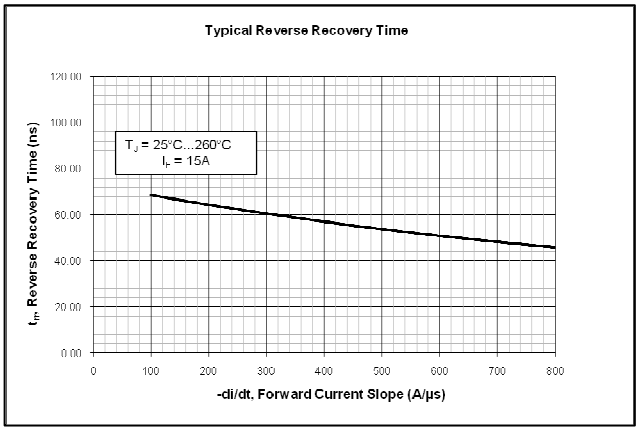






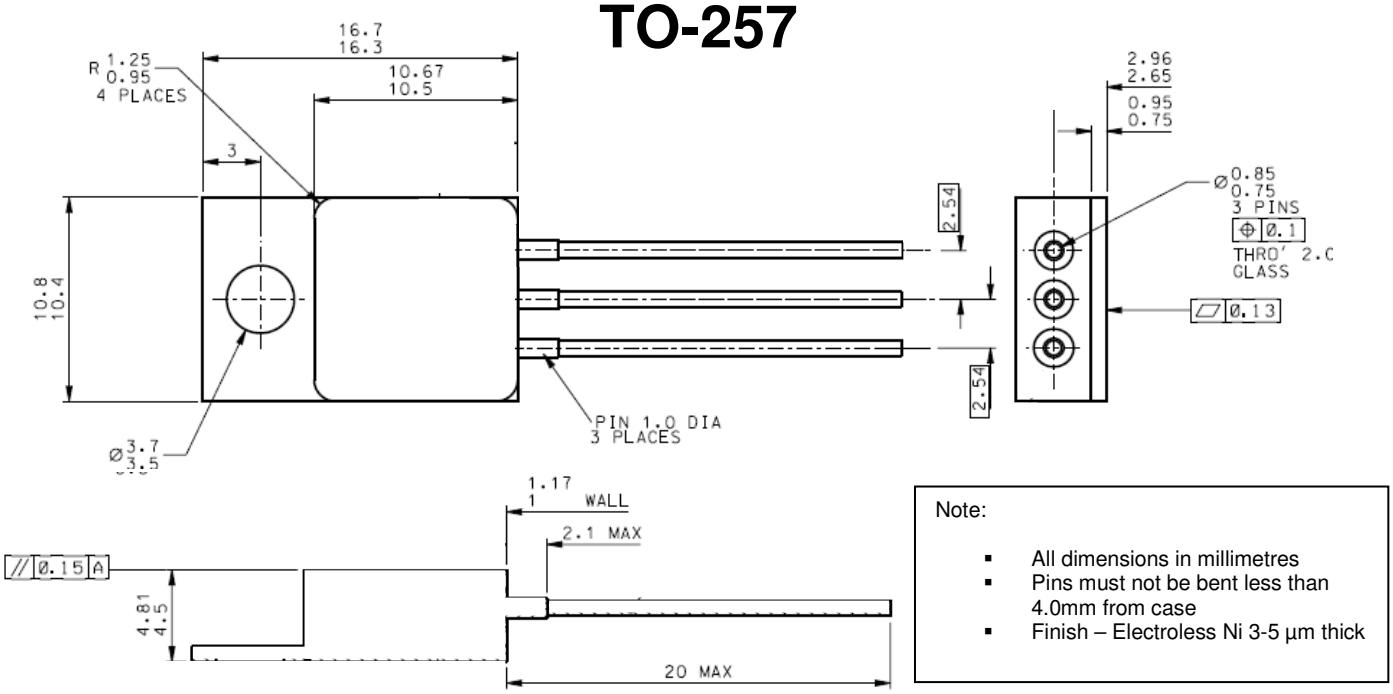






Mechanical Dimensions

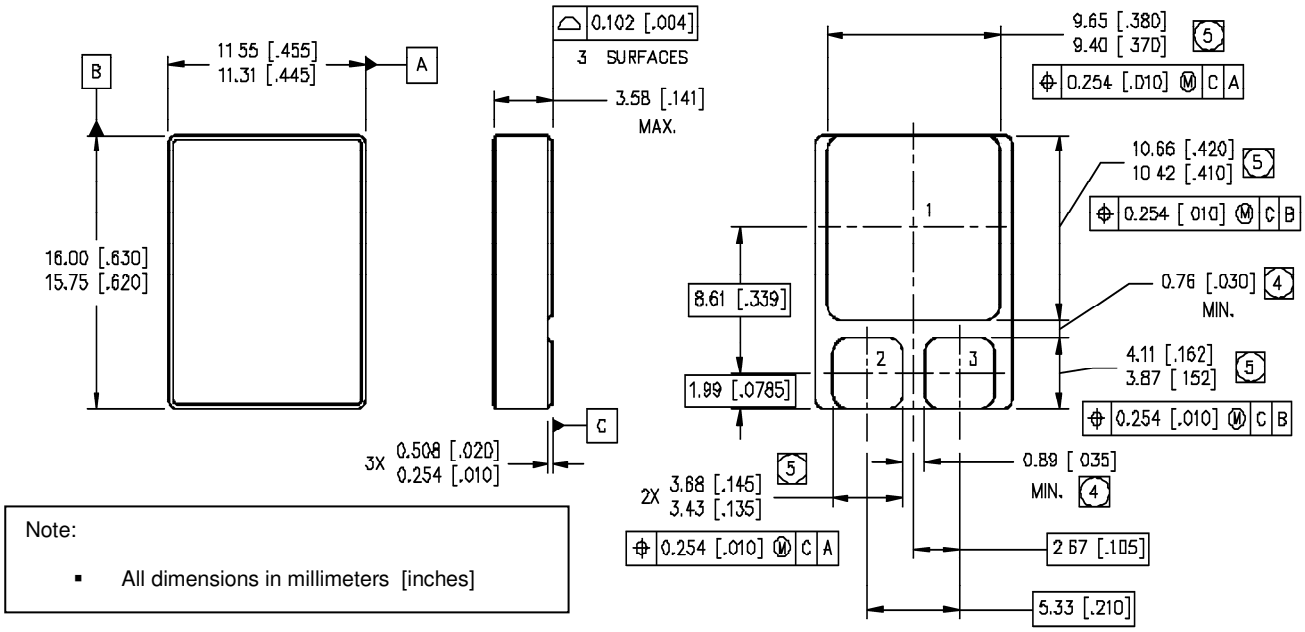
TO-257



Note:

- All dimensions in millimetres
- Pins must not be bent less than 4.0mm from case
- Finish – Electroless Ni 3-5 µm thick

TO-276AB(SMD)

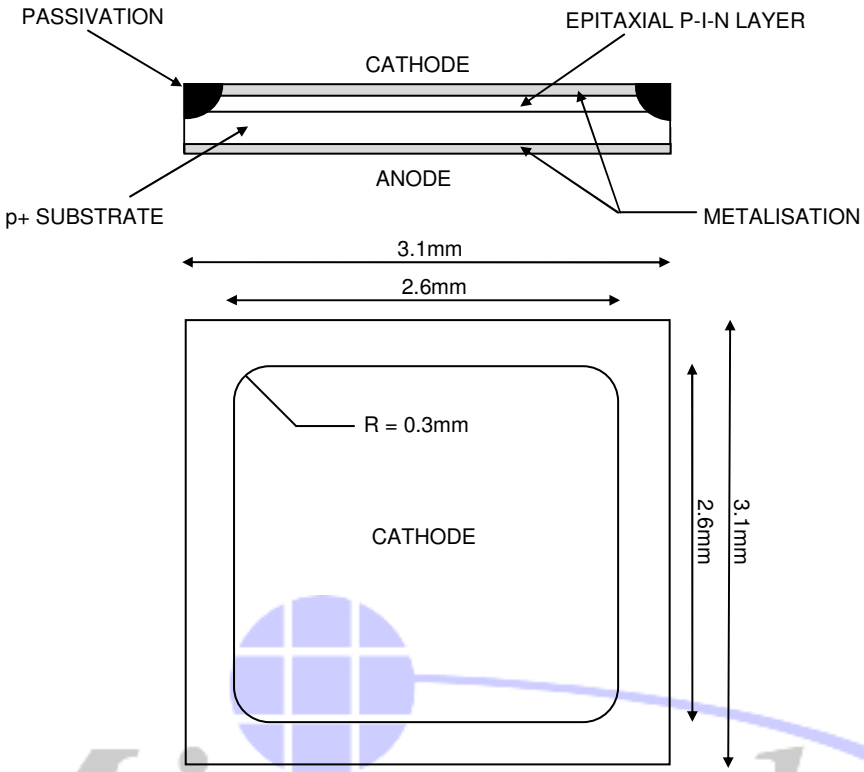


Note:

- All dimensions in millimeters [inches]

Mechanical Dimensions

Bare Die



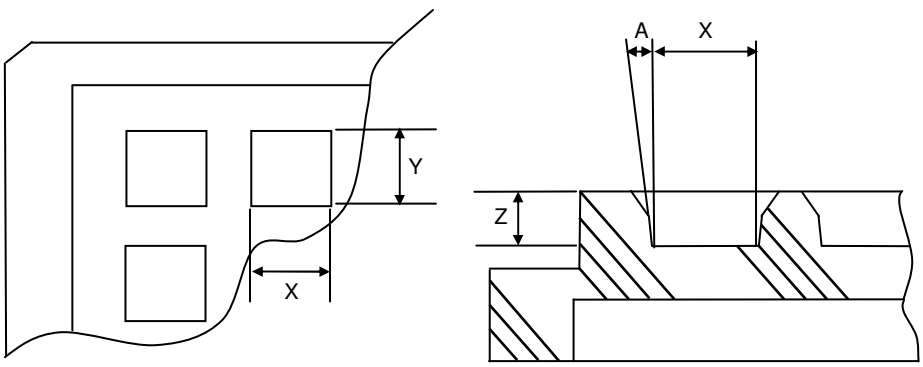
DIMENSIONS	3.1mm x 3.1mm	THICKNESS 400µm ± 20µm
Note: For custom thicknesses please contact us		

TOP METAL	Al OR Au (See order code below)
BACK METAL	Au

DUT1508-AG	Al TOPSIDE Au BACKSIDE
DUT1508-GG	Au TOPSIDE Au BACKSIDE

Waffle Pack Dimensions

Note: For other supply formats please contact us



POCKET DETAILS

X = 3.20mm ±0.05mm pocket size
Y = 3.20mm ±0.05mm pocket size
Z = 1.19mm ±0.08mm pocket depth
A = 5° ±1/2° pocket draft angle
No Cross Slots
Array = 10 X 10 (100)

OVERALL TRAY SIZE

Size = 50.80mm ±0.10mm
Height = 3.96mm +0.05mm -0.08mm
Flatness = 0.10mm

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