



DUT1505 – 500V, 15A

August 2009

Preliminary
Mintech

HIGH EFFICIENCY, TEMPERATURE INDEPENDENT GaAs RECTIFIER DIODE

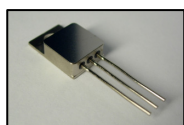
General Description

The DUT1505 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.

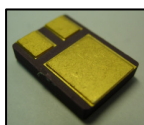
Features

- 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

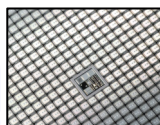
Package Types



TO-257



TO-276AB (SMD)



BARE DIE

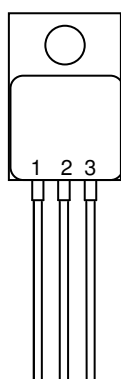
Applications

- High temperature electronics
- Power Modules
- Hybrid circuits

Thermal Characteristics

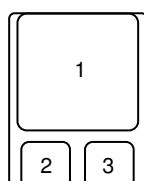
SYMBOL	PARAMETER	PACKAGE	RATINGS	UNITS
$R_{\theta JC}$	MAXIMUM THERMAL RESISTANCE, JUNCTION TO CASE	TO-276AI	3.51	°C/W
$R_{\theta JC}$	MAXIMUM THERMAL RESISTANCE, JUNCTION TO CASE	TO-257AIN	1.45	°C/W
$R_{\theta JC}$	MAXIMUM THERMAL RESISTANCE, JUNCTION TO CASE	TO-276AB	1.24	°C/W

TO-257AI / TO-257AIN



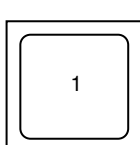
- 1 CATHODE
- 2 ANODE
- 3 CATHODE

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
DUT1505AL	TO-257AI	-65 TO 260 °C
DUT1505ALN	TO-257AIN	-65 TO 260 °C
DUT1505S	TO-276AB	-65 TO 260 °C
DUT1505-AG	BARE DIE	-65 TO 260 °C
DUT1505-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 REPETITIVE REVERSE VOLTAGE	500	V
V_{RWM}	WORKING PEAK REPETITIVE REVERSE VOLTAGE	500	V
V_R	DC BLOCKING VOLTAGE	500	V
$I_{F(AV)}$	AVERAGE RECTIFIED FORWARD CURRENT @ 260°C	15	A
I_{FSM}	NON-REPETITIVE PEAK SURGE CURRENT 60Hz SINGLE HALF-SINE WAVE	150	A
T_J, T_{STG}	OPERATING AND STORAGE TEMPERATURE RANGE	-65 to +260	°C

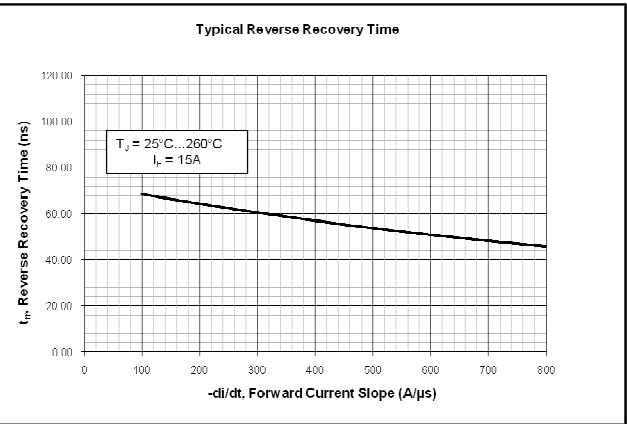
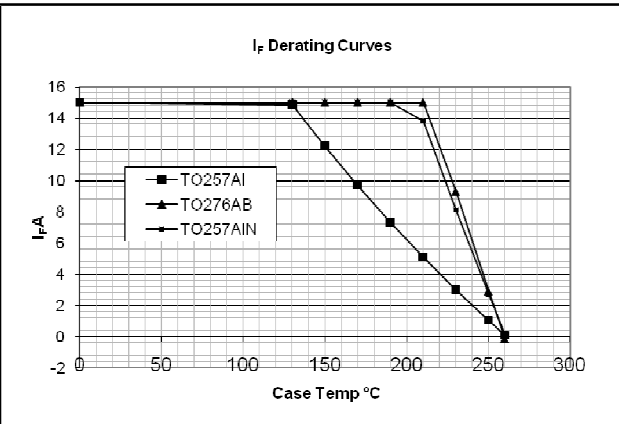
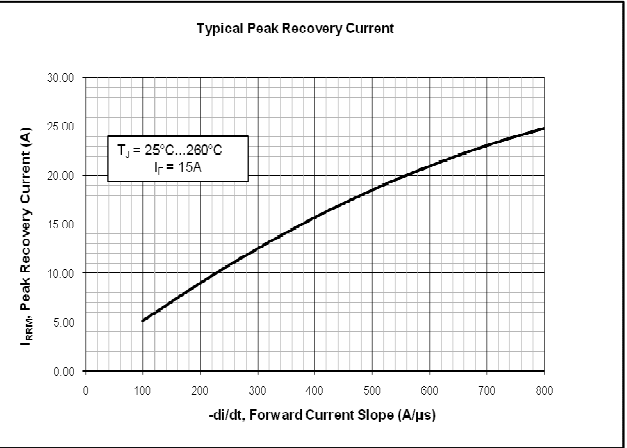
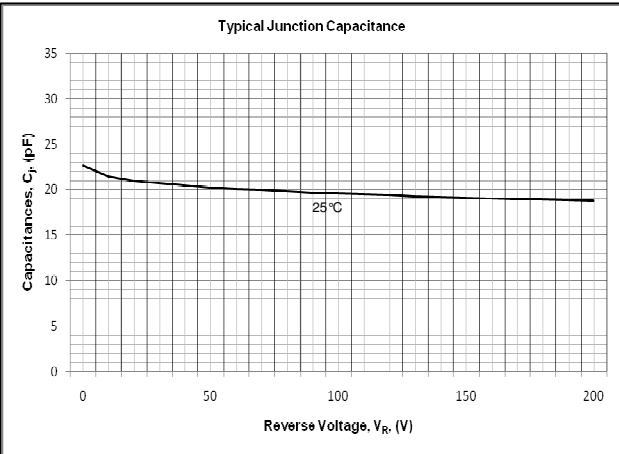
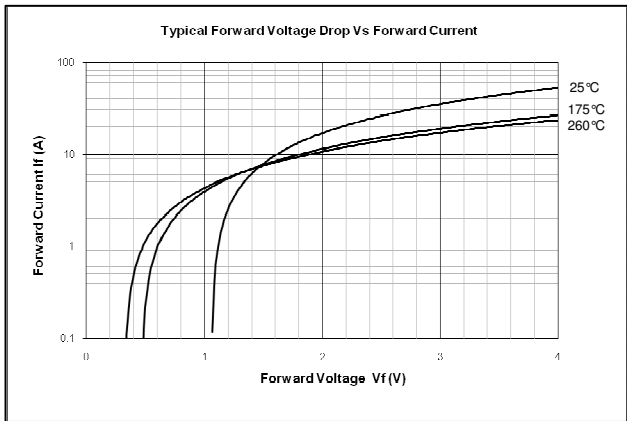
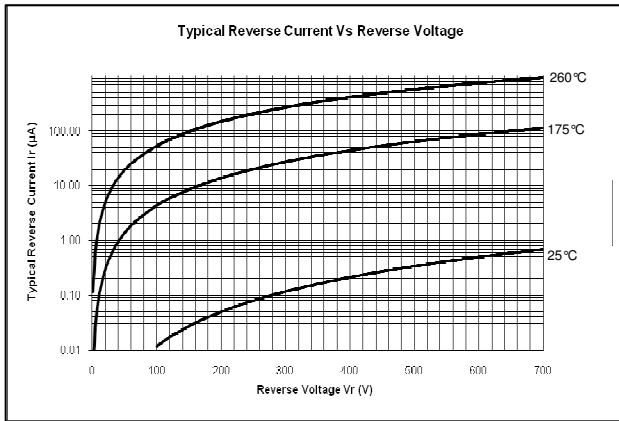
Electrical Characteristics

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS
V_{FM1}	$I_F=15A$ $T_C = 25^\circ C$ $T_C = 175^\circ C$ $T_C = 260^\circ C$	- - -	1.8 2.1 2.3	1.9 2.2 2.5	V
I_{RM1}	$V_R=500V$ $T_C = 25^\circ C$ $T_C = 175^\circ C$ $T_C = 260^\circ C$	- - -	0.40 125 1000	1 130 1100	μA
t_{RR}	$I_F=1A, di/dt = 200 A/\mu s, V_R=30V$ $T_C = 25^\circ C$ $T_C = 175^\circ C$ $T_C = 260^\circ C$	- - -	30 30 30	35 35 35	ns
t_{RR} I_{RR} Q_{RR}	$I_F=15A, di/dt = 200 A/\mu s, V_R=200V$ $T_C = 25^\circ C$	- - -	65 9 300	75 10 370	ns A nC
t_{RR} I_{RR} Q_{RR}	$I_F=15A, di/dt = 200 A/\mu A, V_R=200V$ $T_C = 175^\circ C$	- - -	65 9 300	75 10 370	ns A nC
t_{RR} I_{RR} Q_{RR}	$I_F=15A, di/dt = 200 A/\mu A, V_R=200V$ $T_C = 260^\circ C$	- - -	65 9 300	75 10 370	ns A nC
C_J	$T_J = 25^\circ C, f = 1MHz, V_R = 200V$	-	18	22	pF
W_{AVL}	AVALANCHE ENERGY ($L=2Mh$)	-	10	-	mJ

Notes:

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

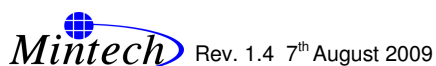
Typical Performance Characteristics



TO-257

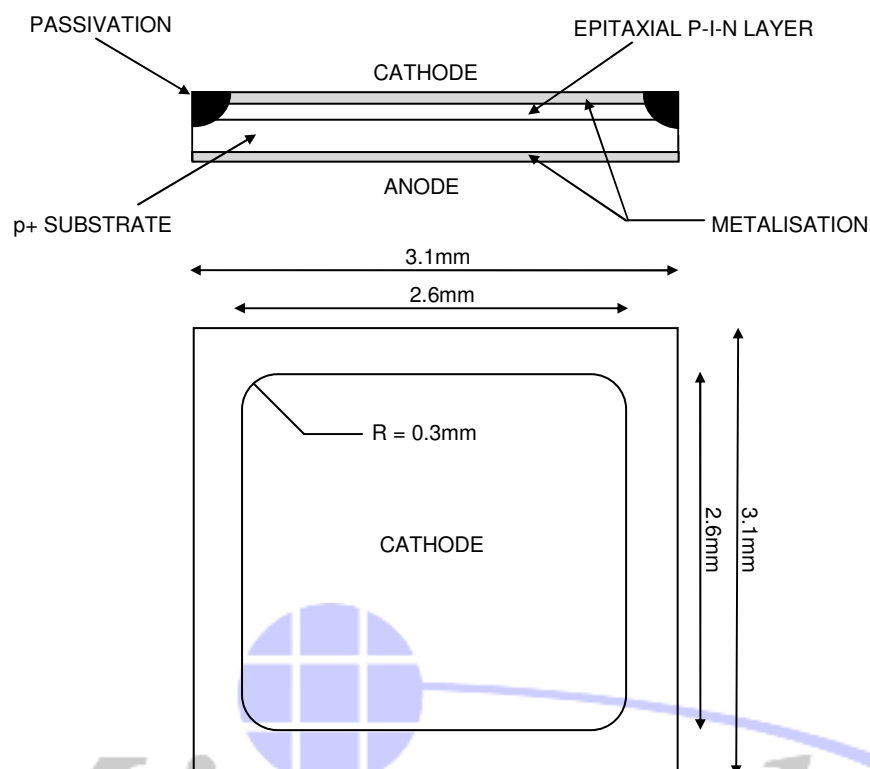


TO-276AB(SMD)



Mechanical Dimensions

Bare Die



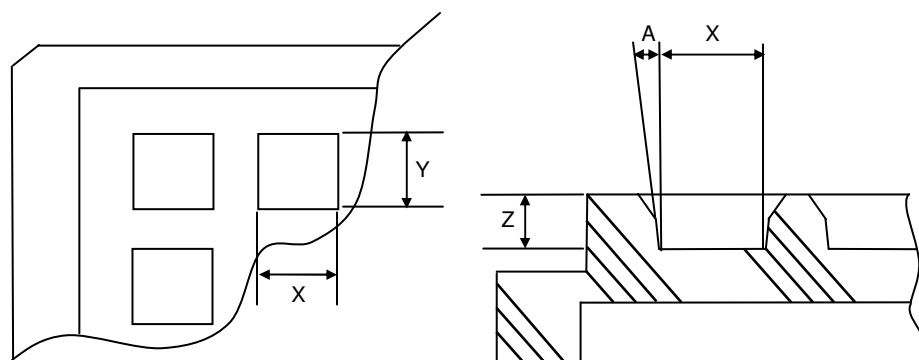
DIMENSIONS	3.1mm x 3.1mm	THICKNESS 400µm ± 20µm
Note: For custom thicknesses please contact us		

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

DUT1505-AG	Al TOPSIDE Au BACKSIDE
DUT1505-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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