

# Gallium Arsenide Schottky Rectifier

 $I_{FAV} = 5.4 \text{ A}$   
 $V_{RRM} = 250 \text{ V}$   
 $C_{Junction} = 6.4 \text{ pF}$ 

Type	Marking on product		Circuit	Package
A = Anode, C = Cathode, TAB = Cathode				
DGS 3-025AS	3A250AS	Single		TO-252 AA
DGS 4-025A	DGS 4-025A	Single		TO-220 AC
DGSK 8-025A	DGSK 8-025A	Common cathode		TO-220 AB

Symbol	Conditions	Maximum Ratings	
$V_{RRM/RSM}$		250	V
$I_{FAV}$	$T_C = 25^\circ\text{C}; \text{DC}$	5.4	A
$I_{FAV}$	$T_C = 90^\circ\text{C}; \text{DC}$	3.9	A
$I_{FSM}$	$T_{VJ} = 45^\circ\text{C}; t_p = 10 \text{ ms (50 Hz), sine}$	10	A
$T_{VJ}$		-55...+175	$^\circ\text{C}$
$T_{stg}$		-55...+150	$^\circ\text{C}$
$P_{tot}$	$T_C = 25^\circ\text{C}$	18	W
$M_d$	mounting torque (TO-220)	0.4...0.6	Nm

## Features

- Low forward voltage
- Very high switching speed
- Low junction capacity of GaAs  
- low reverse current peak at turn off
- Soft turn off
- Temperature independent switching behaviour
- High temperature operation capability
- Epoxy meets UL 94V-0

## Applications

- MHz switched mode power supplies (SMPs)
- Small size SMPs
- High frequency converters
- Resonant converters

Symbol	Conditions	Characteristic Values	
		typ.	max.
$I_R$ ①	$T_{VJ} = 25^\circ\text{C} \quad V_R = V_{RRM}$ $T_{VJ} = 125^\circ\text{C} \quad V_R = V_{RRM}$	0.7	0.7 mA mA
$V_F$	$I_F = 2 \text{ A}; \quad T_{VJ} = 125^\circ\text{C}$	1.3	V
	$I_F = 2 \text{ A}; \quad T_{VJ} = 25^\circ\text{C}$	1.3	1.6 V
$C_J$	$V_R = 100 \text{ V}; \quad T_{VJ} = 125^\circ\text{C}$	6.4	pF
$R_{thJC}$		8.5	K/W
$R_{thCH}$	TO-220	0.5	K/W
Weight	TO-252	0.3	g
	TO-220	2	g

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

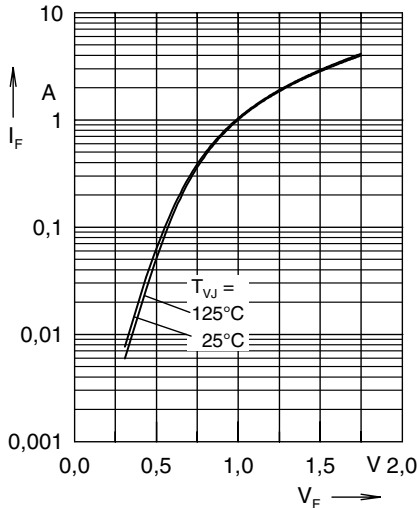


Fig. 1 typ. forward characteristics

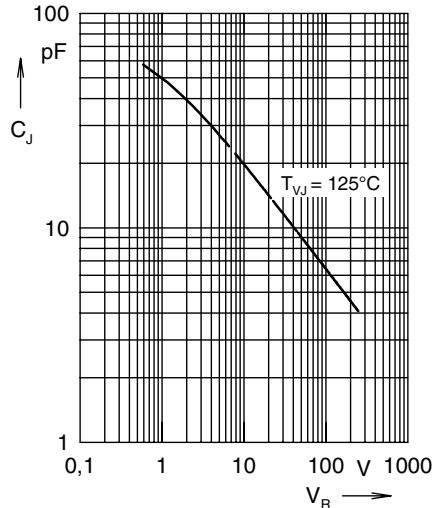


Fig. 2 typ. junction capacity versus blocking voltage

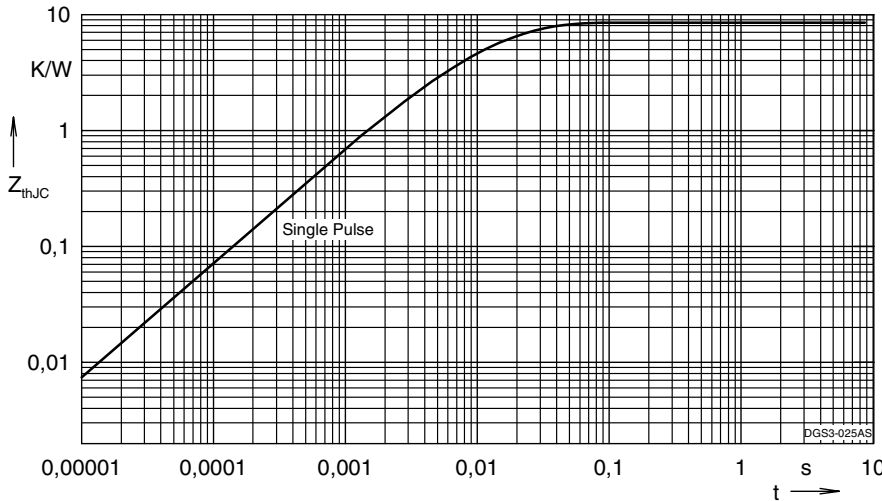
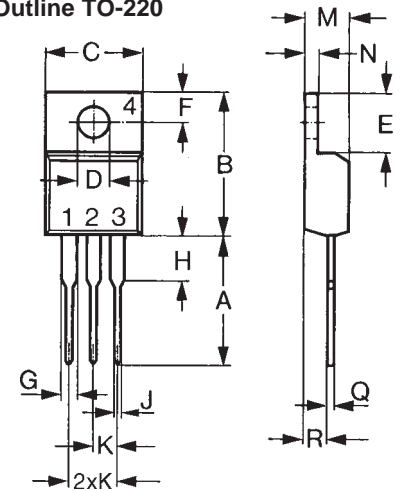


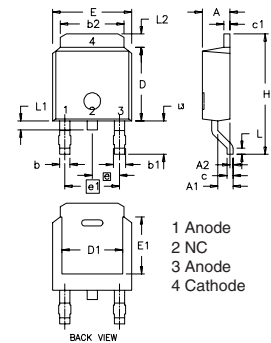
Fig. 3 typ. thermal impedance junction to case

Outline TO-220



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.70	13.97	0.500	0.550
B	14.73	16.00	0.580	0.630
C	9.91	10.66	0.390	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.270
F	2.54	3.18	0.100	0.125
G	1.15	1.65	0.045	0.065
H	2.79	5.84	0.110	0.230
J	0.64	1.01	0.025	0.040
K	2.54	BSC	0.100	BSC
M	4.32	4.82	0.170	0.190
N	1.14	1.39	0.045	0.055
Q	0.38	0.56	0.015	0.022
R	2.29	2.79	0.090	0.110

Outlines TO-252



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
A2	0	0.13	0	0.005
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.32	5.21	0.170	0.205
E	6.35	6.73	0.250	0.265
E1	4.32	5.21	0.170	0.205
e	2.28	BSC	0.090	BSC
e1	4.57	BSC	0.180	BSC
H	9.40	10.42	0.370	0.410
L	0.51	1.02	0.020	0.040
L1	0.64	1.02	0.025	0.040
L2	0.89	1.27	0.035	0.050
L3	2.54	2.92	0.100	0.115

Note:  
explanatory comparison of the basic operational behaviour of rectifier diodes and Gallium Arsenide Schottky diodes:

	Rectifier Diode	GaAs Schottky Diode
conduction	by majority + minority carriers	by majority carriers only
forward characteristics	$V_F(I_F)$	$V_F(I_F)$ , see Fig. 1
turn off characteristics	extraction of excess carriers causes temperature dependant reverse recovery ( $t_{rr}$ , $I_{RM}$ , $Q_{rr}$ )	reverse current charges junction capacity $C_J$ , see Fig. 2; not temperature dependant
turn on characteristics	delayed saturation leads to $V_{FR}$	no turn on overvoltage peak

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