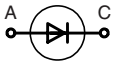
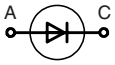
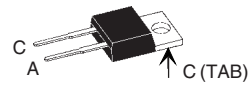
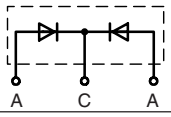
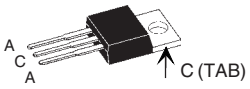
Gallium Arsenide Schottky Rectifier

I_{FAV} = 5.4 A
V_{RRM} = 250 V
$C_{Junction}$ = 6.4 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°C; DC	5.4	A
I_{FAV}	T_C = 90°C; DC	3.9	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	10	A
T_{VJ}		-55...+175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	18	W
M_d	mounting torque (TO-220)	0.4...0.6	Nm

Symbol	Conditions		Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C	$V_R = V_{RRM}$		0.7	mA
	T_{VJ} = 125°C	$V_R = V_{RRM}$	0.7		mA
V_F	I_F = 2 A;	T_{VJ} = 125°C	1.3		V
	I_F = 2 A;	T_{VJ} = 25°C	1.3	1.6	V
C_J	V_R = 100 V;	T_{VJ} = 125°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

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

0435

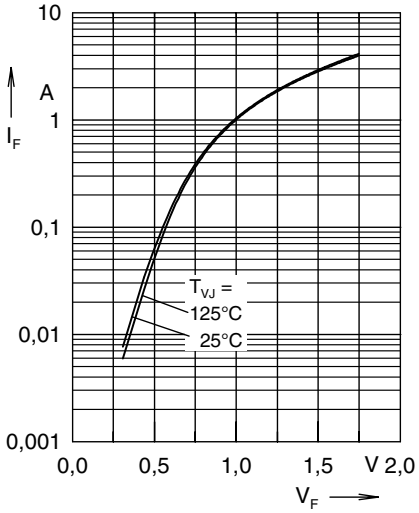


Fig. 1 typ. forward characteristics

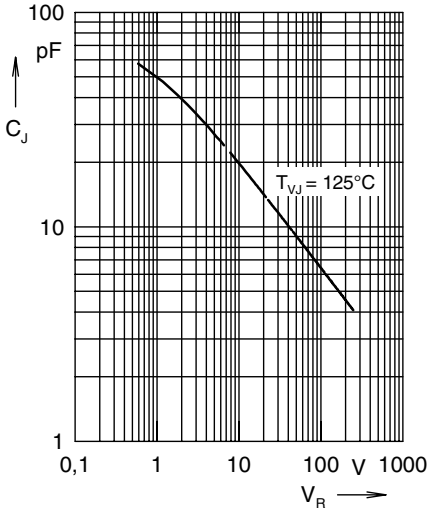


Fig. 2 typ. junction capacity versus blocking voltage

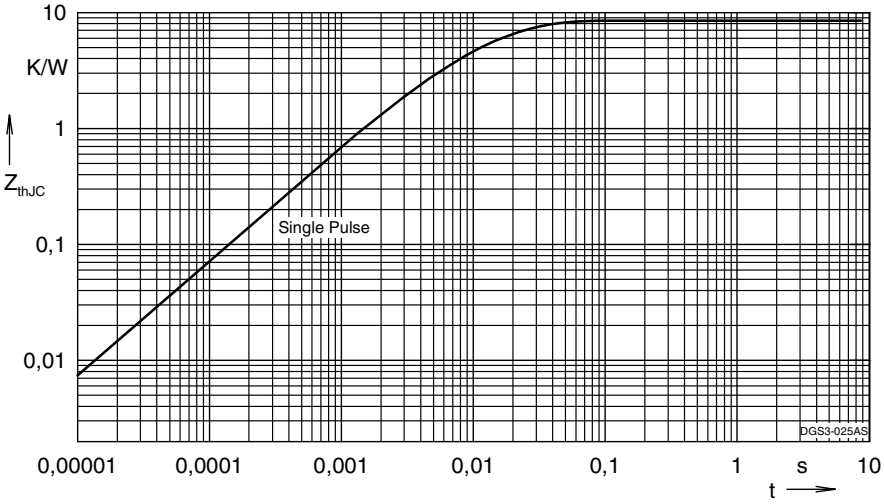
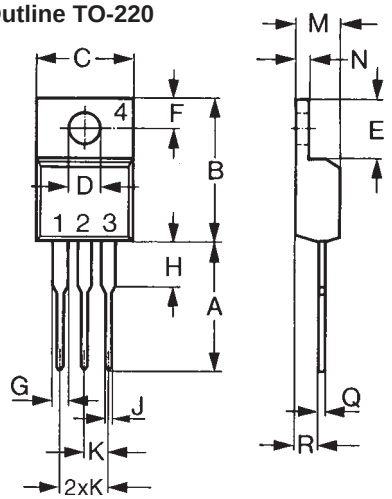


Fig. 3 typ. thermal impedance junction to case

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

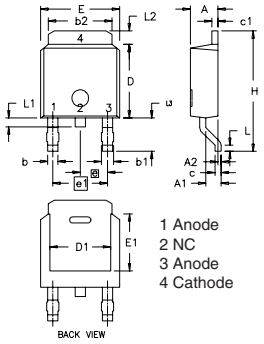
	Rectifier Diode	GaAs Schottky Diode
conduction	by majority + minority carriers	by majority carriers only
forward characteristics	V_F (I_F)	V_F (I_F), see Fig. 1
turn off characteristics	extraction of excess carriers	reverse current charges
	causes temperature dependant	junction capacity C_J, see Fig.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

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

0435

IXYS reserves the right to change limits, test conditions and dimensions