

# Gallium Arsenide Schottky Rectifier

$I_{FAV} = 18 \text{ A}$   
 $V_{RRM} = 220/250 \text{ V}$   
 $C_{Junction} = 26 \text{ pF}$

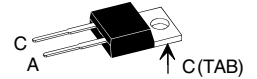
## Preliminary Data

$V_{RSM}$ V	$V_{RRM}$ V	Type
220	220	DGS 20-022A
250	250	DGS 20-025A

} Single



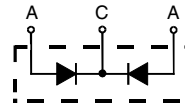
TO-220 AC



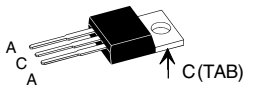
A = Anode, C = Cathode, TAB = Cathode

$V_{RSM}$ V	$V_{RRM}$ V	Type
220	220	DGSK 40-022A
250	250	DGSK 40-025A

} Common cathode



TO-220 AB



Symbol	Conditions	Maximum Ratings	
$I_{FAV}$	$T_C = 25^\circ\text{C}$ ; DC	18	A
$I_{FAV}$	$T_C = 90^\circ\text{C}$ ; DC	13	A
$I_{FSM}$	$T_{VJ} = 45^\circ\text{C}$ ; $t_p = 10 \text{ ms}$ (50 Hz), sine	30	A
$T_{VJ}$		-55...+175	$^\circ\text{C}$
$T_{stg}$		-55...+150	$^\circ\text{C}$
$P_{tot}$	$T_C = 25^\circ\text{C}$	48	W
$M_d$	mounting torque	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	$T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$		2.0	mA
	$T_{VJ} = 125^\circ\text{C}$ $V_R = V_{RRM}$	2.0		mA
$V_F$	$I_F = 7.5 \text{ A}$ ; $T_{VJ} = 125^\circ\text{C}$	1.3		V
	$I_F = 7.5 \text{ A}$ ; $T_{VJ} = 25^\circ\text{C}$	1.2	1.5	V
$C_J$	$V_R = 100 \text{ V}$ ; $T_{VJ} = 125^\circ\text{C}$	26		pF
$R_{thJC}$			3.1	KW
$R_{thCH}$		0.5		KW
Weight		2		g

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %  
 Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, Conditions and dimensions.

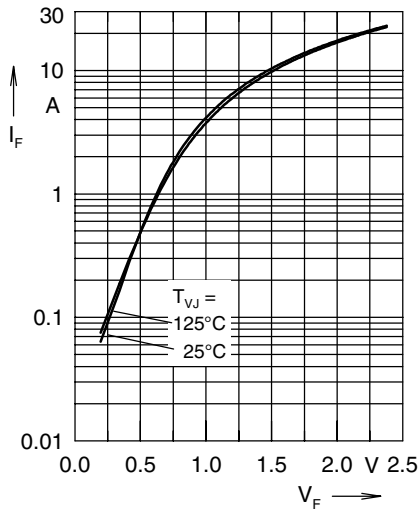


Fig. 1 typ. forward characteristics

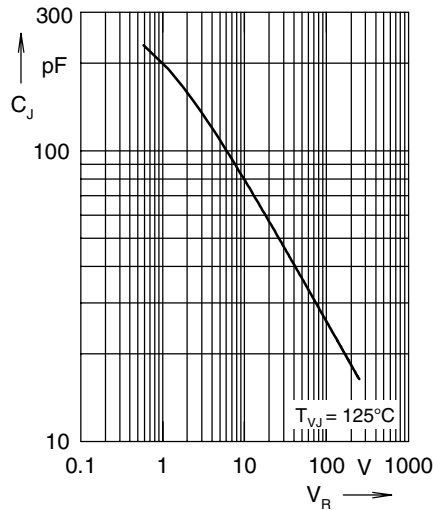


Fig. 2 typ. junction capacity versus blocking voltage

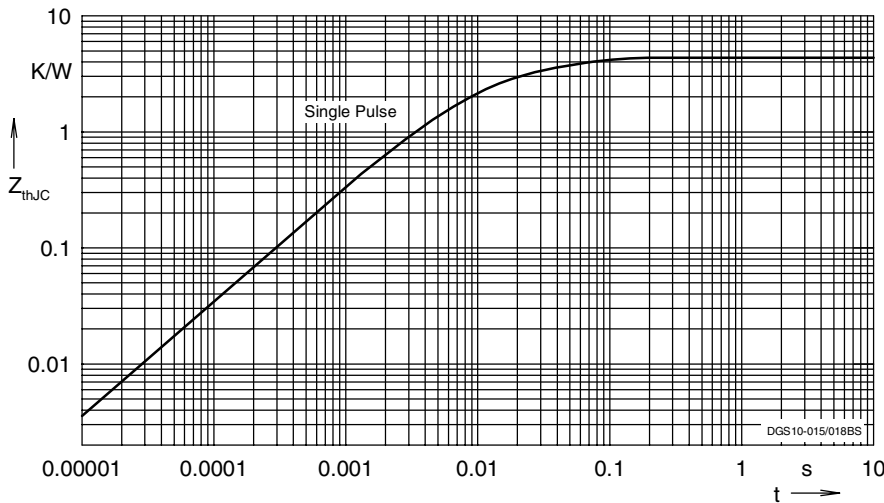
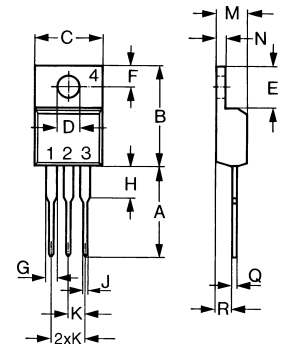


Fig. 3 typ. thermal impedance junction to case

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 causes temperature dependant reverse recovery ( $t_{rr}$ , $I_{RM}$ , $Q_{rr}$ )	reverse current charges junction capacity $C_J$ , see Fig. 2;
turn on characteristics	delayed saturation leads to $V_{FR}$	not temperature dependant no turn on overvoltage peak

Outline (center pin only for DGSK types)



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