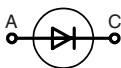
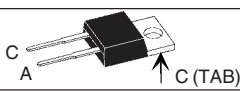
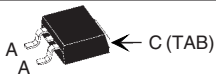
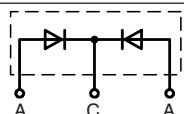
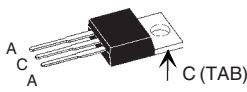


# Gallium Arsenide Schottky Rectifier

$I_{FAV} = 15 \text{ A}$   
 $V_{RRM} = 180 \text{ V}$   
 $C_{Junction} = 22 \text{ pF}$

| Type                                  | Marking on product |                | Circuit                                                                            | Package                                                                                       |
|---------------------------------------|--------------------|----------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| A = Anode, C = Cathode, TAB = Cathode |                    |                |                                                                                    |                                                                                               |
| DGS 10-018A                           | DGS 10-018A        | Single         |  | TO-220 AC  |
| DGS 10-018AS                          | DGS 10-018AS       | Single         |  | TO-263 AB  |
| DGSK 20-018A                          | DGSK 20-018A       | Common cathode |  | TO-220 AB  |

| Symbol        | Conditions                                                        | Maximum Ratings             |
|---------------|-------------------------------------------------------------------|-----------------------------|
| $V_{RRM/RSM}$ |                                                                   | 180 V                       |
| $I_{FAV}$     | $T_C = 25^\circ\text{C}$ ; DC                                     | 15 A                        |
| $I_{FAV}$     | $T_C = 90^\circ\text{C}$ ; DC                                     | 11 A                        |
| $I_{FSM}$     | $T_{VJ} = 45^\circ\text{C}$ ; $t_p = 10 \text{ ms}$ (50 Hz), sine | 20 A                        |
| $T_{VJ}$      |                                                                   | -55...+175 $^\circ\text{C}$ |
| $T_{stg}$     |                                                                   | -55...+150 $^\circ\text{C}$ |
| $P_{tot}$     | $T_C = 25^\circ\text{C}$                                          | 34 W                        |
| $M_d$         | mounting torque (Versions A only)                                 | 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    | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$<br>$T_{VJ} = 125^\circ\text{C}$ $V_R = V_{RRM}$             | 1.3 mA<br>1.3 mA        |
| $V_F$      | $I_F = 5 \text{ A}$ ; $T_{VJ} = 125^\circ\text{C}$<br>$I_F = 5 \text{ A}$ ; $T_{VJ} = 25^\circ\text{C}$ | 0.8 V<br>0.8 V<br>1.1 V |
| $C_J$      | $V_R = 100 \text{ V}$ ; $T_{VJ} = 125^\circ\text{C}$                                                    | 22 pF                   |
| $R_{thJC}$ |                                                                                                         | 4.4 K/W                 |
| $R_{thCH}$ | TO-220                                                                                                  | 0.5 K/W                 |
| 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.

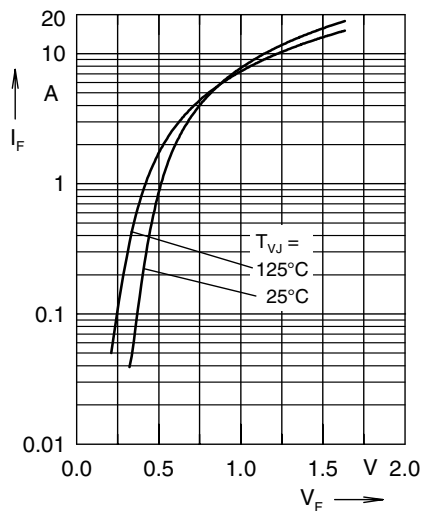


Fig. 1 typ. forward characteristics

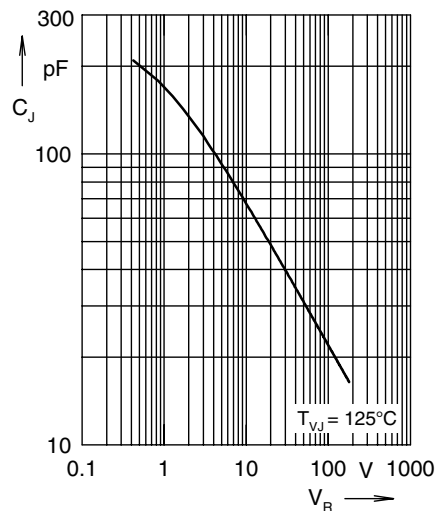


Fig. 2 typ. junction capacity  
versus blocking voltage

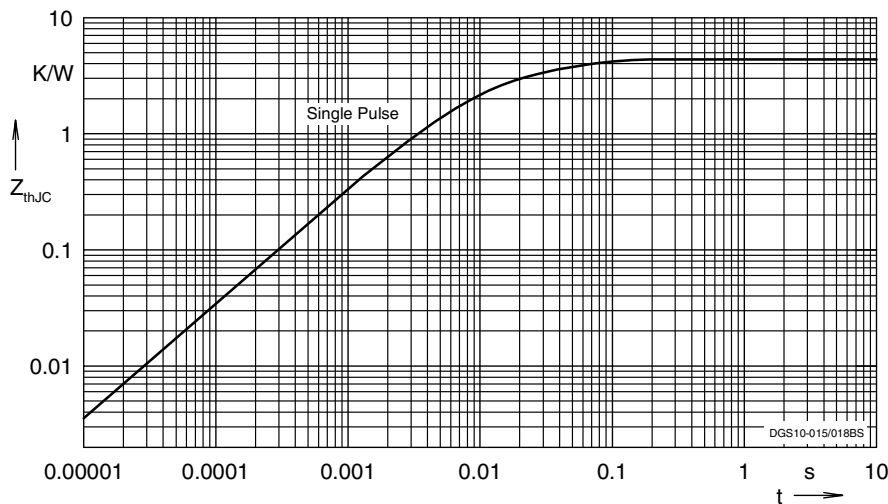


Fig. 3 typ. thermal impedance junction to case

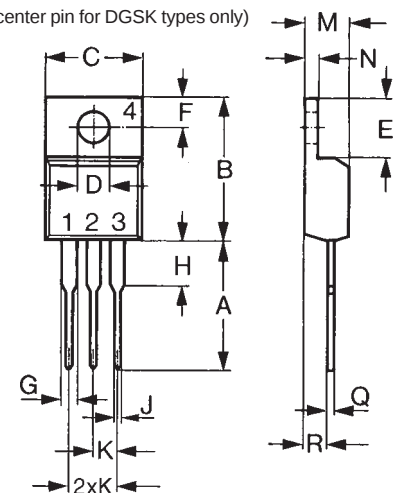
Note:

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

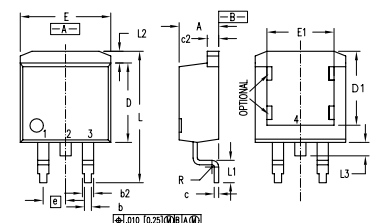
### Outline TO-220

(center pin for DGSK types only)



| Dim. | Millimeter<br>Min. Max. | Inches<br>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         |

### Outline TO-263 AB



| Dim. | Millimeter<br>Min. Max. | Inches<br>Min. Max. |
|------|-------------------------|---------------------|
| A    | 4.06 4.83               | .160 .190           |
| A1   | 2.03 2.79               | .080 .110           |
| b    | 0.51 0.99               | .020 .039           |
| b2   | 1.14 1.40               | .045 .055           |
| c    | 0.46 0.74               | .018 .029           |
| c2   | 1.14 1.40               | .045 .055           |
| D    | 8.64 9.65               | .340 .380           |
| D1   | 8.00 8.89               | .315 .350           |
| E    | 9.65 10.29              | .380 .405           |
| E1   | 6.22 8.13               | .245 .320           |
| e    | 2.54 BSC                | .100 BSC            |
| L    | 14.61 15.88             | .575 .625           |
| L1   | 2.29 2.79               | .090 .110           |
| L2   | 1.02 1.40               | .040 .055           |
| L3   | 1.27 1.78               | .050 .070           |
| L4   | 0 0.20                  | 0 .008              |
| R    | 0.46 0.74               | .018 .029           |

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