

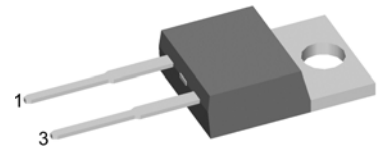
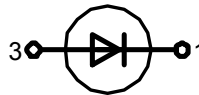
# Sonic-FRD

High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 Single Diode

$V_{RRM} = 600\text{ V}$   
 $I_{FAV} = 5\text{ A}$   
 $t_{rr} = 35\text{ ns}$

Part number

**DHG 5 I 600PA**



Backside: cathode

### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low  $I_{rm}$ -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low  $I_{rm}$  reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

### Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

### Package:

- TO-220AC
- Industry standard outline
  - Epoxy meets UL 94V-0
  - RoHS compliant

### Ratings

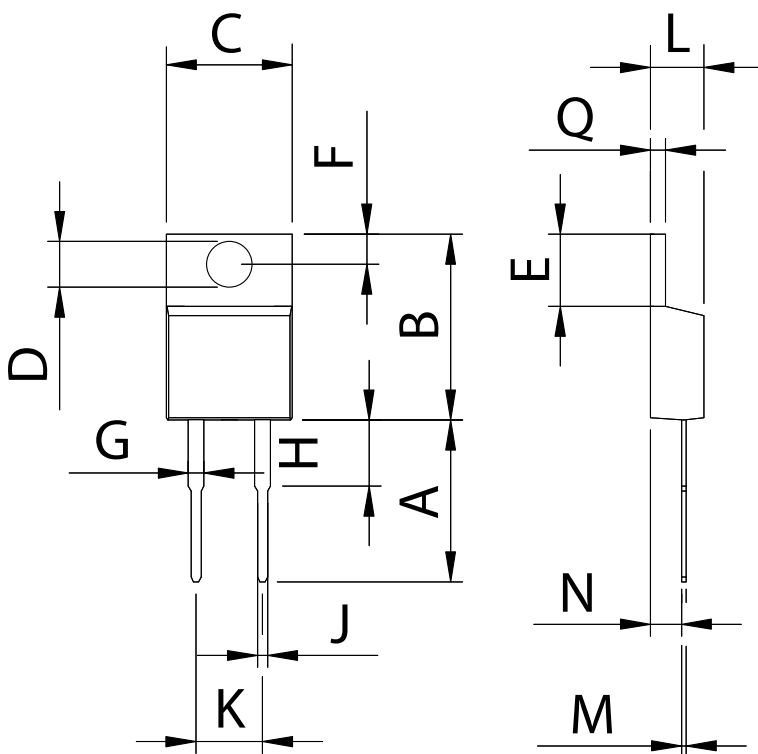
Symbol	Definition	Conditions	Ratings			Unit	
			min.	typ.	max.		
$V_{RRM}$	max. repetitive reverse voltage	$T_{VJ} = 25\text{ °C}$			600	V	
$I_R$	reverse current	$V_R = 600\text{ V}$			10	$\mu\text{A}$	
		$V_R = 600\text{ V}$			1	mA	
$V_F$	forward voltage	$I_F = 5\text{ A}$			2.20	V	
		$I_F = 10\text{ A}$			2.98	V	
		$I_F = 5\text{ A}$	$T_{VJ} = 125\text{ °C}$			2.02	V
		$I_F = 10\text{ A}$	$T_{VJ} = 125\text{ °C}$			2.85	V
$I_{FAV}$	average forward current	rectangular, $d = 0.5$			5	A	
$V_{F0}$	threshold voltage	} for power loss calculation only			1.31	V	
$r_F$	slope resistance				133	$\text{m}\Omega$	
$R_{thJC}$	thermal resistance junction to case				3.15	K/W	
$T_{VJ}$	virtual junction temperature		-55		150	$^{\circ}\text{C}$	
$P_{tot}$	total power dissipation	$T_C = 25\text{ °C}$			40	W	
$I_{FSM}$	max. forward surge current	$t_p = 10\text{ ms (50 Hz), sine}$	$T_{VJ} = 45\text{ °C}$		40	A	
$I_{RM}$	max. reverse recovery current	$I_F = 5\text{ A};$ $-di_F/dt = 100\text{ A}/\mu\text{s}$	$T_{VJ} = 25\text{ °C}$		2	A	
			$T_{VJ} = 125\text{ °C}$			A	
$t_{rr}$	reverse recovery time	$V_R = 400\text{ V}$	$T_{VJ} = 25\text{ °C}$		35	ns	
			$T_{VJ} = 125\text{ °C}$			ns	
$C_J$	junction capacitance	$V_R = 300\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25\text{ °C}$		tbd	pF	
$E_{AS}$	non-repetitive avalanche energy	$I_{AS} = \text{tbd A}; L = 100\text{ }\mu\text{H}$	$T_{VJ} = 25\text{ °C}$		tbd	mJ	
$I_{AR}$	repetitive avalanche current	$V_A = 1.5 \cdot V_R \text{ typ.}; f = 10\text{ kHz}$			tbd	A	

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per pin*			35	A
$R_{thCH}$	thermal resistance case to heatsink			0.50		K/W
$M_D$	mounting torque		0.4		0.6	Nm
$F_C$	mounting force with clip		20		60	N
$T_{sta}$	storage temperature		-55		150	°C
<b>Weight</b>				2		g

\* Irms is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.

In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

### Outlines TO-220AC



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.70	14.73	0.500	0.580
B	14.23	16.51	0.560	0.650
C	9.66	10.66	0.380	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	2.300	0.420
F	2.54	3.42	0.100	0.135
G	1.15	1.77	0.045	0.070
H	-	6.35	-	0.250
J	0.64	0.89	0.025	0.035
K	4.83	5.33	0.190	0.210
L	3.56	4.82	0.140	0.190
M	0.51	0.76	0.020	0.030
N	2.04	2.49	0.080	0.115
Q	0.64	1.39	0.025	0.055