



preliminary

Sonic Fast Recovery Diode

V_{RRM}	=	600 V
I_{FAV}	=	20 A
t_{rr}	=	40 ns

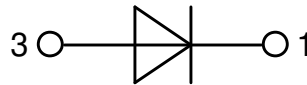
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

Part number

DHG20I600PA



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-220

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

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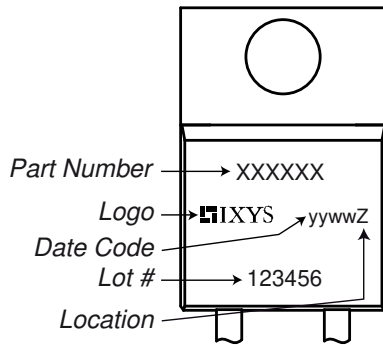
Fast Diode				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			600	V	
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			600	V	
I_R	reverse current, drain current	$V_R = 600 V$	$T_{VJ} = 25^{\circ}C$		30	μA	
		$V_R = 600 V$	$T_{VJ} = 125^{\circ}C$		1.5	mA	
V_F	forward voltage drop	$I_F = 20 A$	$T_{VJ} = 25^{\circ}C$		2.25	V	
		$I_F = 40 A$			3.17	V	
		$I_F = 20 A$	$T_{VJ} = 125^{\circ}C$		2.21	V	
		$I_F = 40 A$			3.25	V	
I_{FAV}	average forward current	$T_C = 95^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 150^{\circ}C$		20	A	
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}C$		1.15	V	
r_F	slope resistance				45	m Ω	
R_{thJC}	thermal resistance junction to case				0.9	K/W	
R_{thCH}	thermal resistance case to heatsink			0.5		K/W	
P_{tot}	total power dissipation		$T_C = 25^{\circ}C$		140	W	
I_{FSM}	max. forward surge current	$t = 10 ms; (50 Hz), sine; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		150	A	
C_J	junction capacitance	$V_R = 400 V \quad f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		12	pF	
I_{RM}	max. reverse recovery current	} $I_F = 20 A; V_R = 300 V$ $-di_F / dt = 450 A/\mu s$	$T_{VJ} = 25^{\circ}C$		8	A	
			$T_{VJ} = 125^{\circ}C$		12	A	
t_{rr}	reverse recovery time		$T_{VJ} = 25^{\circ}C$		40	ns	
			$T_{VJ} = 125^{\circ}C$		60	ns	



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Package TO-220			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			35	A
T_{VJ}	virtual junction temperature		-55		150	°C
T_{op}	operation temperature		-55		125	°C
T_{stg}	storage temperature		-55		150	°C
Weight				2		g
M_D	mounting torque		0.4		0.6	Nm
F_C	mounting force with clip		20		60	N

Product Marking



Part description

- D = Diode
- H = Sonic Fast Recovery Diode
- G = extreme fast
- 20 = Current Rating [A]
- I = Single Diode
- 600 = Reverse Voltage [V]
- PA = TO-220AC (2)

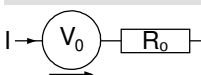
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHG20I600PA	DHG20I600PA	Tube	50	504941

Similar Part	Package	Voltage class
DHG20I600HA	TO-247AD (2)	600

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 150^{\circ}C$

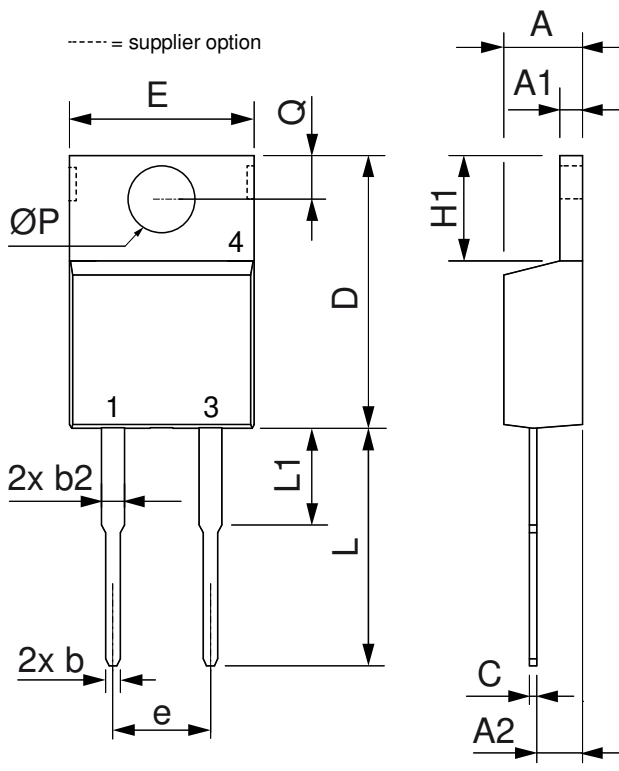


Fast Diode

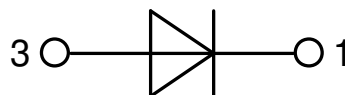
$V_{0\ max}$	threshold voltage	1.15	V
$R_{0\ max}$	slope resistance *	42	mΩ



Outlines TO-220



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	5.08	BSC	0.200	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
ØP	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125



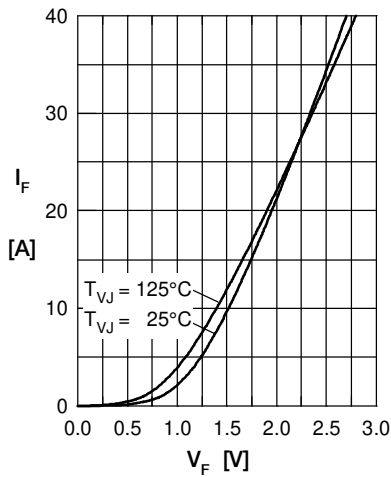
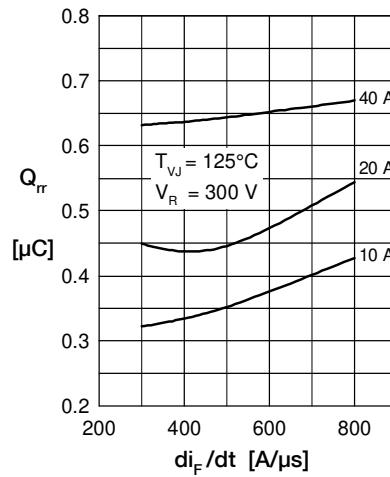
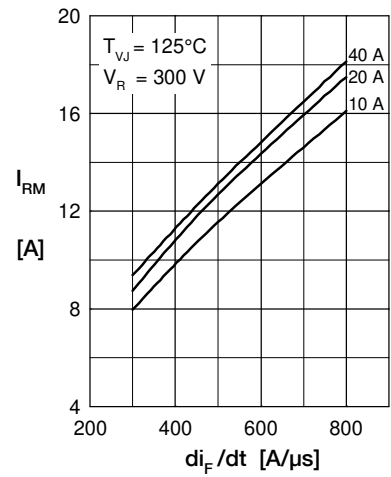
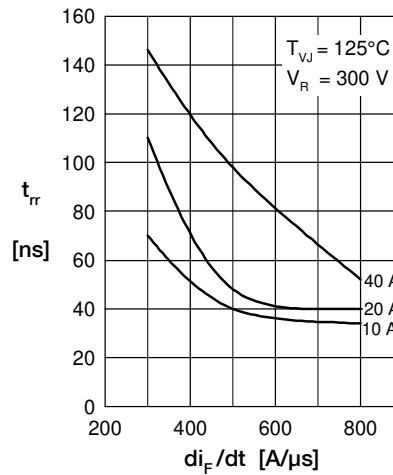
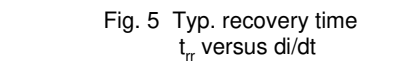
Fast Diode

 Fig. 1 Typ. Forward current versus V_F

 Fig. 2 Typ. reverse recov. charge Q_{rr} versus di/dt

 Fig. 3 Typ. peak reverse current I_{RM} versus di/dt

 Fig. 4 Dynamic parameters Q_{rr} , I_{RM} versus T_{VJ}

 Fig. 5 Typ. recovery time t_{rr} versus di/dt

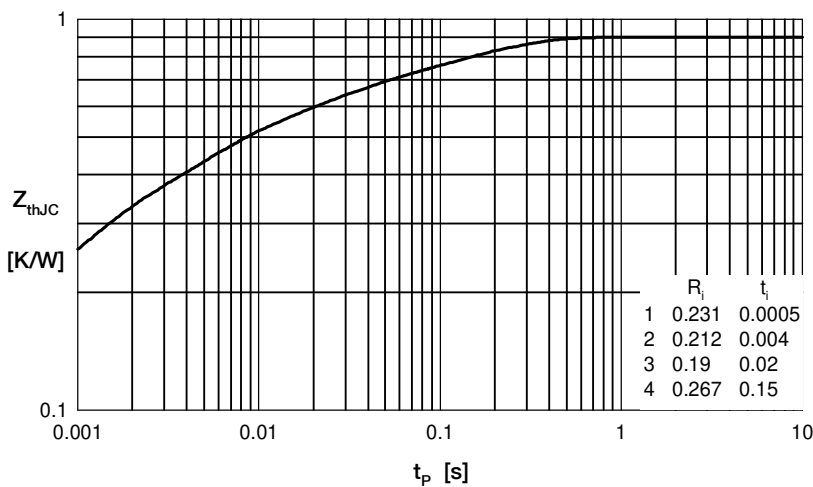
 Fig. 6 Typ. recovery energy E_{rec} versus di/dt


Fig. 7 Typ. transient thermal impedance junction to case