

preliminary

Sonic Fast Recovery Diode

$$V_{RRM} = 1200\text{ V}$$

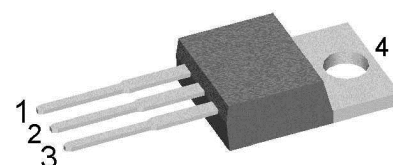
$$I_{FAV} = 2 \times 10\text{ A}$$

$$t_{rr} = 200\text{ ns}$$

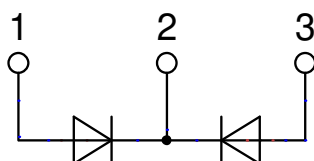
High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Common Cathode

Part number

DHG20C1200PB



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

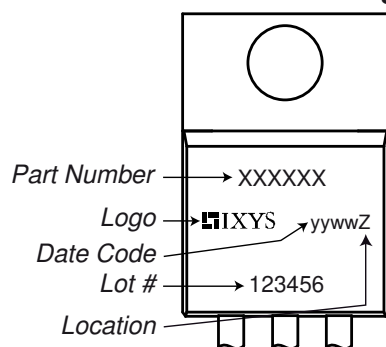
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Fast Diode				Ratings				
Symbol	Definition	Conditions		min.	typ.	max.	Unit	
V _{RSM}	max. non-repetitive reverse blocking voltage	T _{VJ} = 25°C				1200	V	
V _{RRM}	max. repetitive reverse blocking voltage	T _{VJ} = 25°C				1200	V	
I _R	reverse current, drain current	V _R = 1200 V	T _{VJ} = 25°C			10	μA	
		V _R = 1200 V	T _{VJ} = 125°C			0.2	mA	
V _F	forward voltage drop	I _F = 10 A	T _{VJ} = 25°C			2.22	V	
		I _F = 20 A				2.93	V	
		I _F = 10 A	T _{VJ} = 125°C			2.23	V	
		I _F = 20 A				3.14	V	
I _{FAV}	average forward current	T _C = 105°C rectangular d = 0.5	T _{VJ} = 150°C			10	A	
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 150°C		1.23	V	
r _F	slope resistance					90	mΩ	
R _{thJC}	thermal resistance junction to case					1.5	K/W	
R _{thCH}	thermal resistance case to heatsink				0.5		K/W	
P _{tot}	total power dissipation	T _C = 25°C				85	W	
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		60	A	
C _J	junction capacitance	V _R = 600 V f = 1 MHz		T _{VJ} = 25°C	4		pF	
I _{RM}	max. reverse recovery current	} I _F = 10 A; V _R = 600 V -di _F /dt = 250 A/μs		T _{VJ} = 25 °C	9		A	
				T _{VJ} = 125 °C	10.5		A	
t _{rr}	reverse recovery time			T _{VJ} = 25 °C	200		ns	
				T _{VJ} = 125 °C	350		ns	

preliminary

Package TO-220			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ¹⁾			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

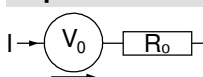
Product Marking

Part description

D = Diode
 H = Sonic Fast Recovery Diode
 G = extreme fast
 20 = Current Rating [A]
 C = Common Cathode
 1200 = Reverse Voltage [V]
 PB = TO-220AB (3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHG20C1200PB	DHG20C1200PB	Tube	50	505280

Equivalent Circuits for Simulation

* on die level

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

Fast Diode
 $V_{0\max}$ threshold voltage

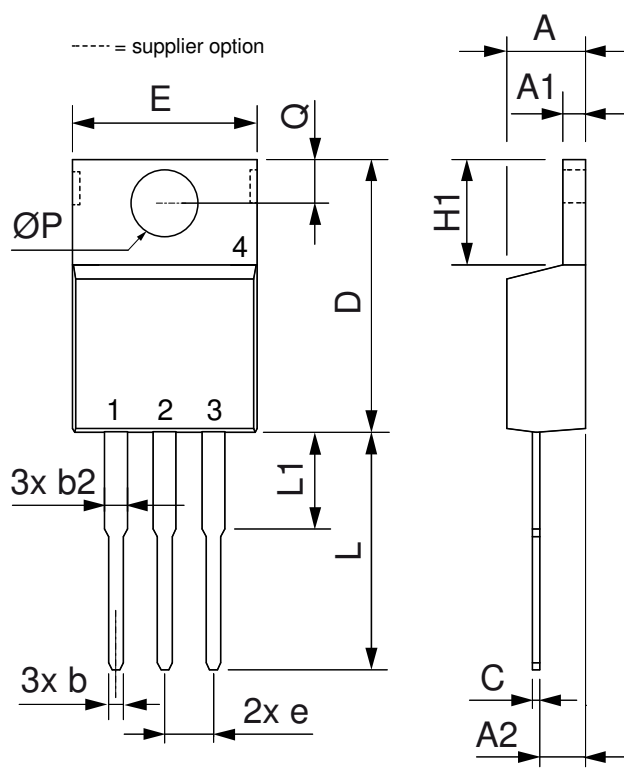
1.23

V

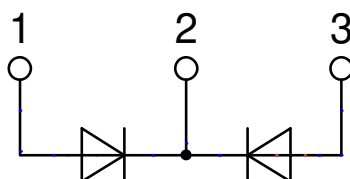
 $R_{0\max}$ slope resistance *

87

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	2.54	BSC	0.100	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



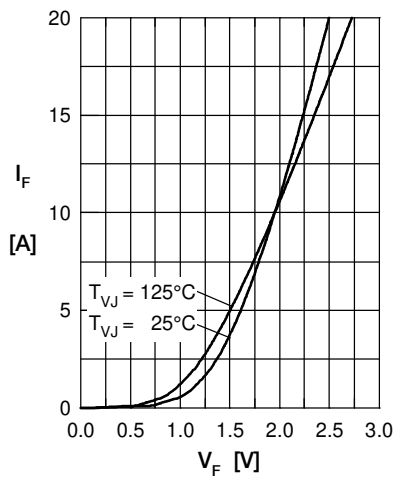
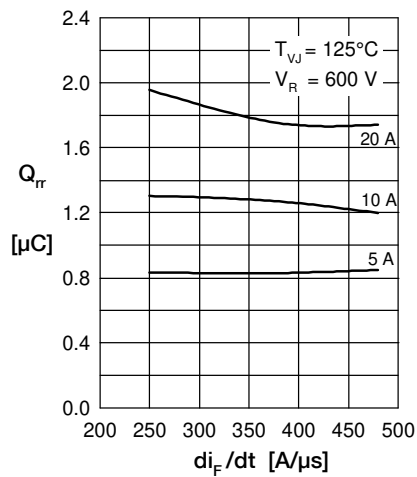
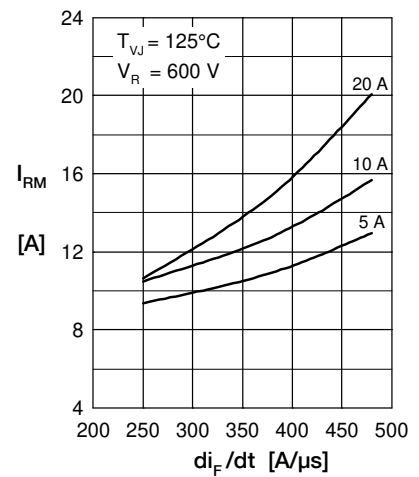
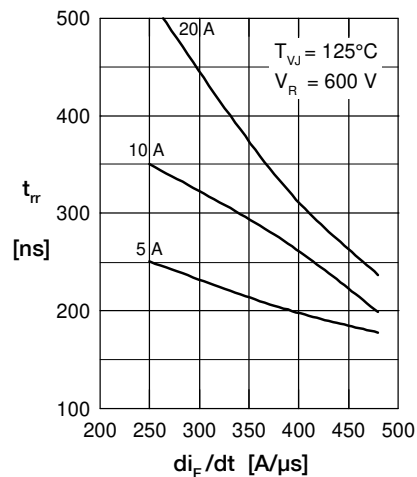
Fast Diode

 Fig. 1 Typ. Forward current versus V_F

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

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

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

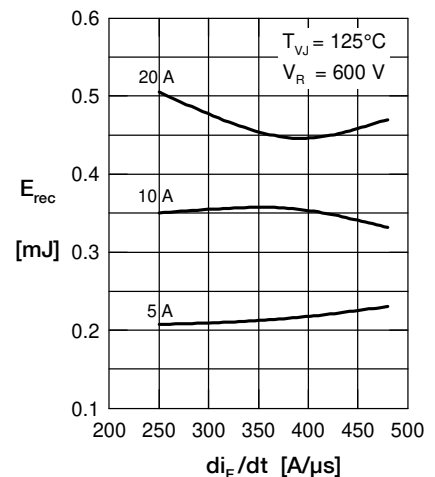
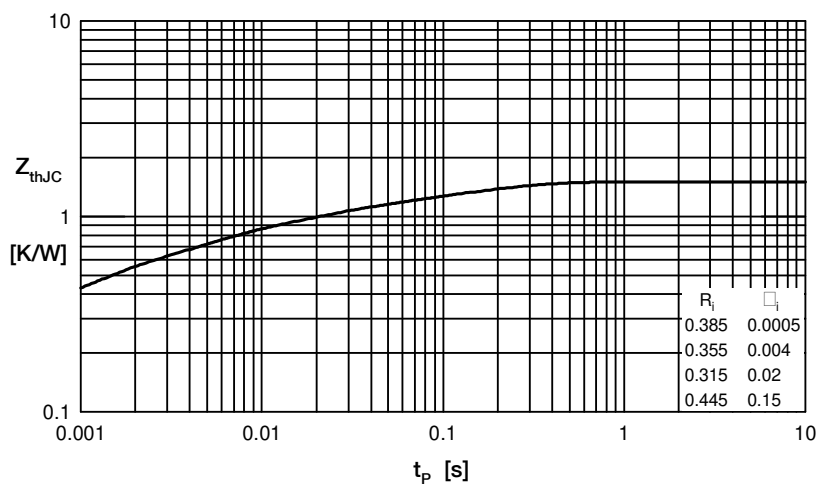
 Fig. 5 Typ. recovery time t_{rr} versus di_F/dt

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


Fig. 7 Typ. transient thermal impedance junction to case