High Voltage Standard Rectifier

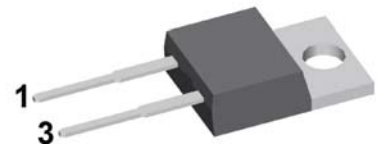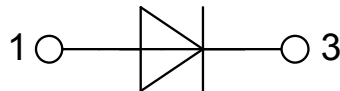|		
V_{RRM}	=	2200 V
I_{FAV}	=	30 A
V_F	=	1.24 V

Single Diode

Part number

DNA30E2200PA

Backside: anode

Features / Advantages:
- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

Applications:
- Diode for main rectification
- For single and three phase bridge configurations

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

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20130123c

Rectifier				**Ratings**			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage		T_{VJ} = 25°C			2300	V
V_{RRM}	max. repetitive reverse blocking voltage		T_{VJ} = 25°C			2200	V
I_R	reverse current	V_R = 2200 V	T_{VJ} = 25°C			40	μA
		V_R = 2200 V	T_{VJ} = 150°C			1.5	mA
V_F	forward voltage drop	I_F = 30 A	T_{VJ} = 25°C			1.26	V
		I_F = 60 A				1.53	V
		I_F = 30 A	T_{VJ} = 150 °C			1.24	V
		I_F = 60 A				1.63	V
I_{FAV}	average forward current	T_C = 140°C	T_{VJ} = 175°C			30	A
		rectangular d = 0.5					
V_{F0}	threshold voltage	} for power loss calculation only	T_{VJ} = 175°C			0.83	V
r_F	slope resistance					13.4	mΩ
R_{thJC}	thermal resistance junction to case					0.7	K/W
R_{thCH}	thermal resistance case to heatsink				0.50		K/W
P_{tot}	total power dissipation		T_C = 25°C			210	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			370	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			400	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			315	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			340	A
I²t	value for fusing	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			685	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			665	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			495	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			480	A²s
C_J	junction capacitance	V_R = 700 V; f = 1 MHz	T_{VJ} = 25°C		7		pF

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		175	°C
T_{op}	operation temperature		-55		150	°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 Number → XXXXXX
Logo → IXYS Zyyww
Assembly Line
Lot # → abcdef
Date Code
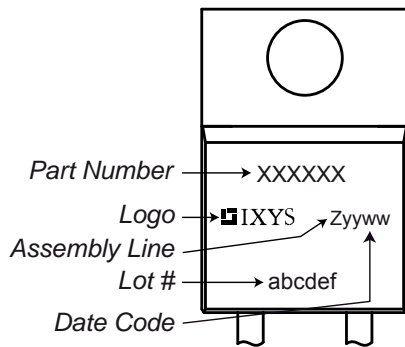
Part number

D = Diode
N = High Voltage Standard Rectifier
A = (>= 2000V)
30 = Current Rating [A]
E = Single Diode
2200 = Reverse Voltage [V]
PA = TO-220AC (2)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DNA30E2200PA	DNA30E2200PA	Tube	50	507762

Similar Part	Package	Voltage class
DNA30E2200PZ	TO-263AB (D2Pak) (2HV)	2200
DNA30EM2200PZ	TO-263AB (D2Pak) (2HV)	2200
DNA30E2200FE	i4-Pac (2HV)	2200
DNA30E2200IY	TO-262 (2HV) (I2PAK)	2200

Equivalent Circuits for Simulation   *on die level T_{VJ} = 175 °C

I — V_0 — R_0
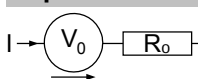
Rectifier

$V_{0\,max}$	threshold voltage	0.83	V
$R_{0\,max}$	slope resistance *	10.2	mΩ

Outlines   TO-220
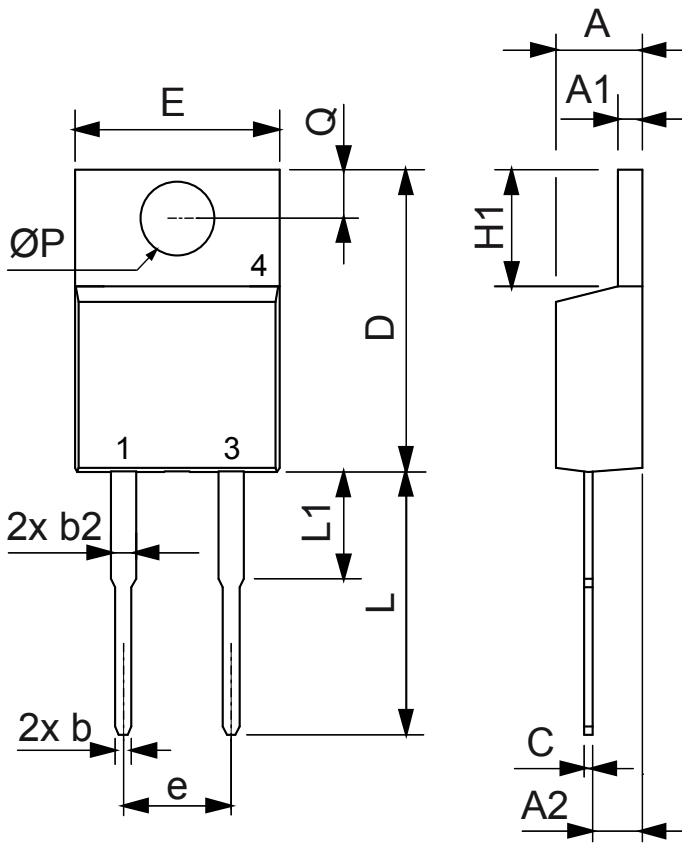
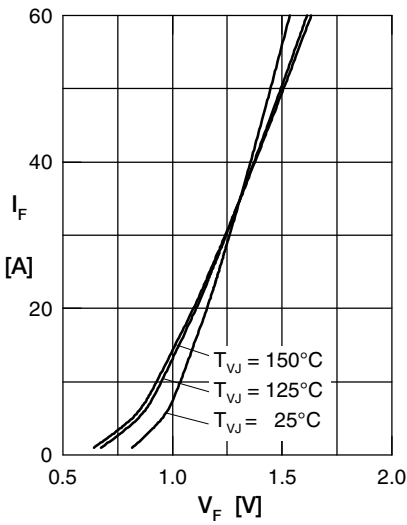| Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	5.08	BSC	0.200	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	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
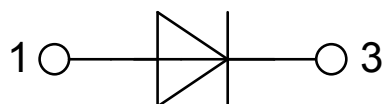
Rectifier

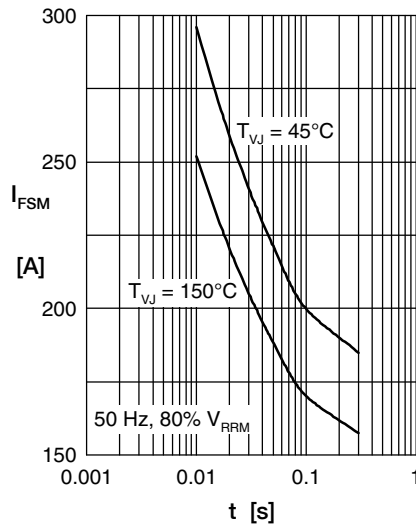Fig. 1 Forward current versus voltage drop per diode
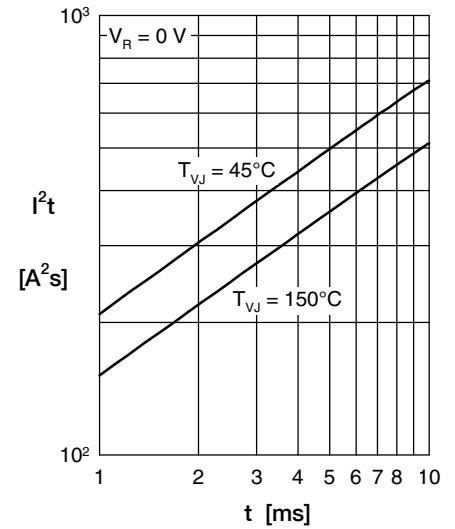

Fig. 2 Surge overload current
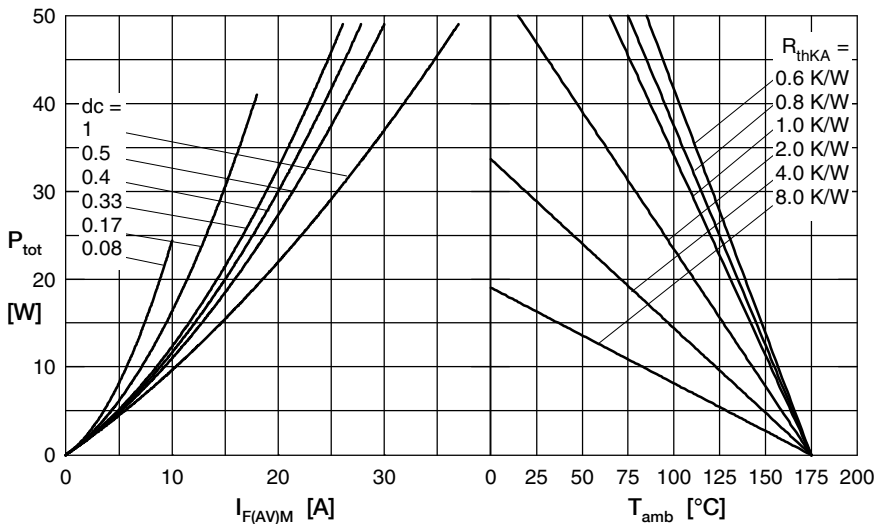

Fig. 3 I^2t versus time per diode

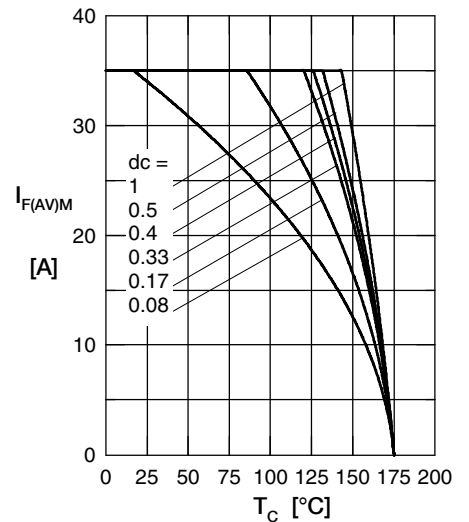Fig. 4 Power dissipation versus direct output current and ambient temperature

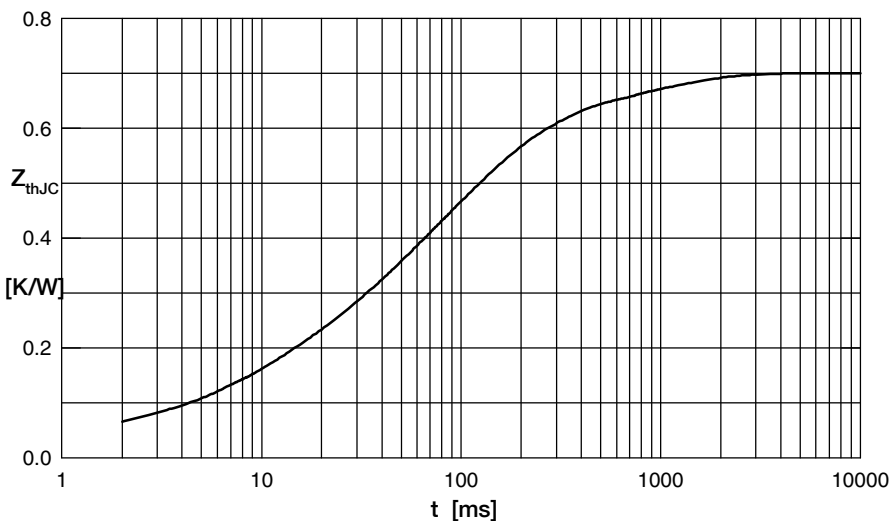Fig. 5 Max. forward current versus case temperature

Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.03	0.0003
2	0.072	0.0065
3	0.131	0.027
4	0.367	0.105
5	0.1	0.8

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20130123c