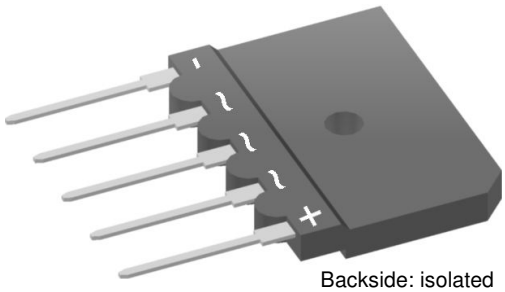
High Voltage Standard Rectifier

3~ Rectifier		
V_{RRM}	=	2200 V
I_{DAV}	=	40 A
I_{FSM}	=	370 A

3~ Rectifier Bridge

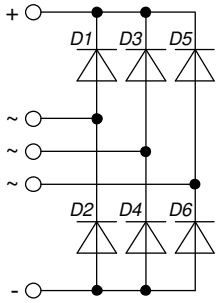
Part number

DNA40U2200GU



Backside: isolated

E72873



Features / Advantages:

- Low forward voltage drop
- Planar passivated chips
- Easy to mount with one screw
- Space and weight savings

Applications:

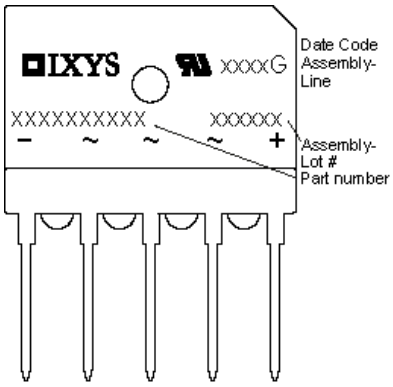
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

Package: GUFP

- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Base plate: Plastic overmolded tab
- Reduced weight

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 = 10 A	T_{VJ} = 25°C			1.06	V
		I_F = 30 A				1.28	V
		I_F = 10 A	T_{VJ} = 150°C			0.92	V
		I_F = 30 A				1.23	V
I_{DAV}	*bridge output current*	T_C = 90°C	T_{VJ} = 175°C			40	A
		rectangular d = ⅓					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.74	V
r_F	*slope resistance* }					16.3	mΩ
R_{thJC}	*thermal resistance junction to case*					4.3	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.50		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			35	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
I^2t	*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 GUFP					Ratings			
Symbol	**Definition**	**Conditions**			**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal					70	A
T_{VJ}	*virtual junction temperature*				-40		175	°C
T_{op}	*operation temperature*				-40		150	°C
T_{stg}	*storage temperature*				-40		150	°C
Weight						8.5		g
M_D	*mounting torque*				0.8		1.2	Nm
F_C	*mounting force with clip*				20		120	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	6.7	5.4			mm
$d_{Spb/Apb}$			*terminal to backside*	10.0	8.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA		2500			V
		t = 1 minute			2100			V



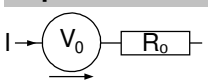
Part description

D = Diode
N = High Voltage Standard Rectifier
A = (>= 2000V)
40 = Current Rating [A]
U = 3~ Rectifier Bridge
2200 = Reverse Voltage [V]
GU = GUFP

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DNA40U2200GU	DNA40U2200GU	Tube	14	514970

Similar Part	Package	Voltage class
DMA40U1800GU	GUFP	1800
GUO40-16NO1	GUFP	1600
GUO40-12NO1	GUFP	1200
GUO40-08NO1	GUFP	800

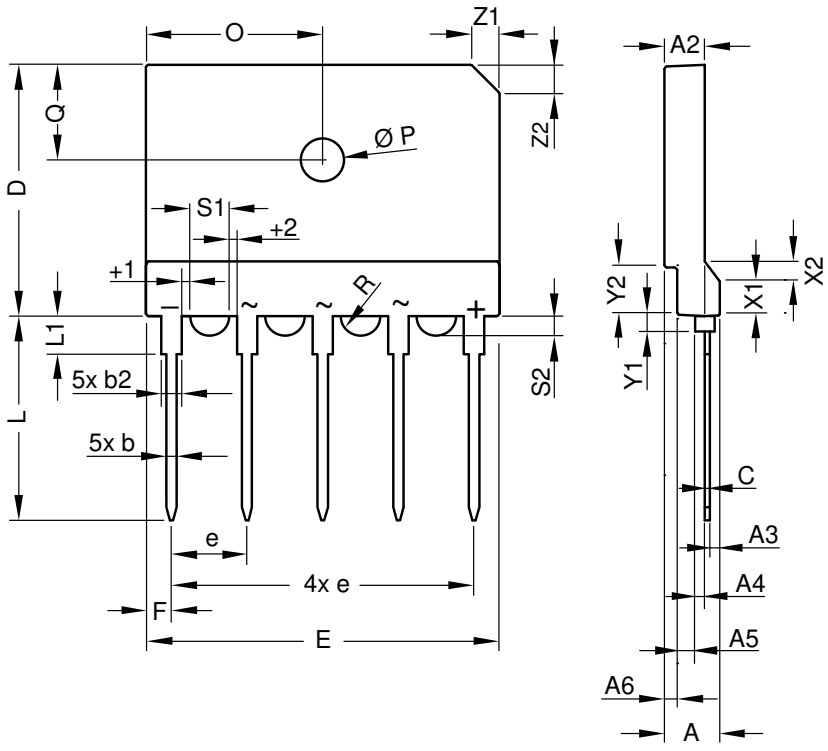
Equivalent Circuits for Simulation ** on die level* T_{VJ} = 175 °C



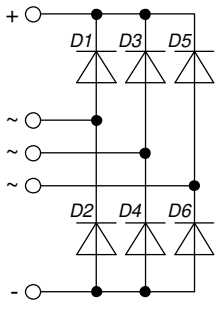
Rectifier

$V_{0\,max}$	*threshold voltage*	0.74	V
$R_{0\,max}$	*slope resistance **	13.7	mΩ

Outlines GUFP



Dim.	Millimeter			Inches		
	min	typ.	max	min	typ.	max
A	5.40	5.50	5.60	0.213	0.217	0.221
A2	3.90	4.00	4.10	0.154	0.158	0.162
A3	0.95	1.00	1.10	0.037	0.039	0.043
A4	0.95	1.00	1.05	0.037	0.039	0.041
A5	1.60	1.70	1.80	0.063	0.067	0.071
A6	1.25	1.30	1.35	0.049	0.051	0.053
b	0.95	1.00	1.05	0.037	0.039	0.041
b2	1.95	2.00	2.05	0.077	0.079	0.081
C	0.45	0.50	0.55	0.018	0.020	0.022
D	24.80	25.00	25.20	0.977	0.985	0.993
E	34.70	35.00	35.30	1.367	1.379	1.391
e	BSC 7.50			BSC 0.296		
F	2.40	2.50	2.60	0.095	0.099	0.102
L	20.30	20.40	20.50	0.800	0.804	0.808
L1	3.70	3.75	3.80	0.146	0.148	0.150
O	17.40	17.50	17.60	0.686	0.690	0.693
Ø P	4.10	4.20	4.30	0.162	0.165	0.169
Q	9.20	9.30	9.40	0.362	0.366	0.370
$^{\varnothing}/_{2}$ R		1.77			0.070	
s1	3.45	3.50	3.55	0.136	0.138	0.140
s2	1.45	1.50	1.55	0.057	0.059	0.061
t1	0.95	1.00	1.05	0.037	0.039	0.041
t2	0.95	1.00	1.05	0.037	0.039	0.041
x1	3.20	3.30	3.40	0.126	0.130	0.134
x2	1.90	2.00	2.10	0.075	0.079	0.083
y1	1.60	1.65	1.70	0.063	0.065	0.067
y2	4.65	4.70	4.75	0.183	0.185	0.187
z1	2.80	2.90	3.00	0.110	0.114	0.118



Rectifier

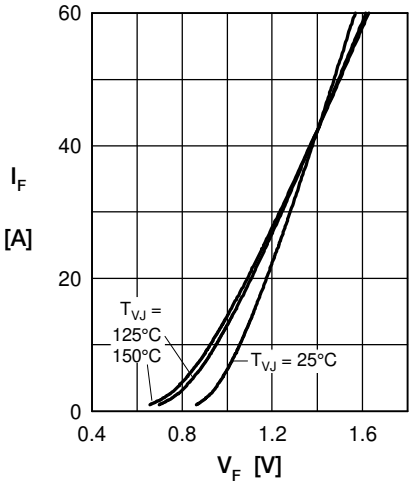


Fig. 1 Forward current vs. voltage drop per diode

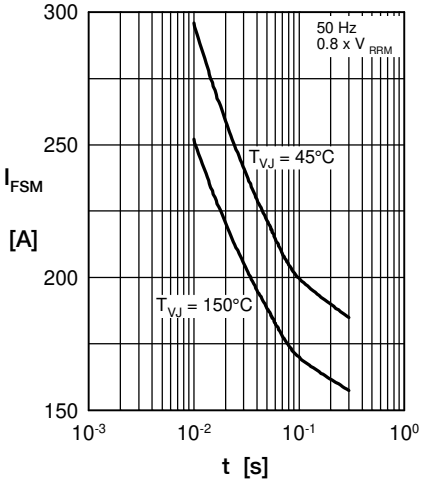


Fig. 2 Surge overload current vs. time per diode

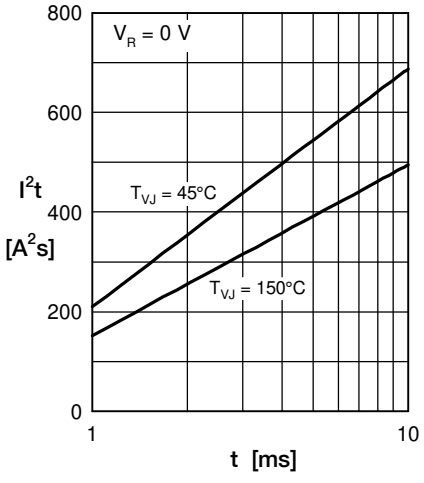


Fig. 3 I^2t vs. time per diode

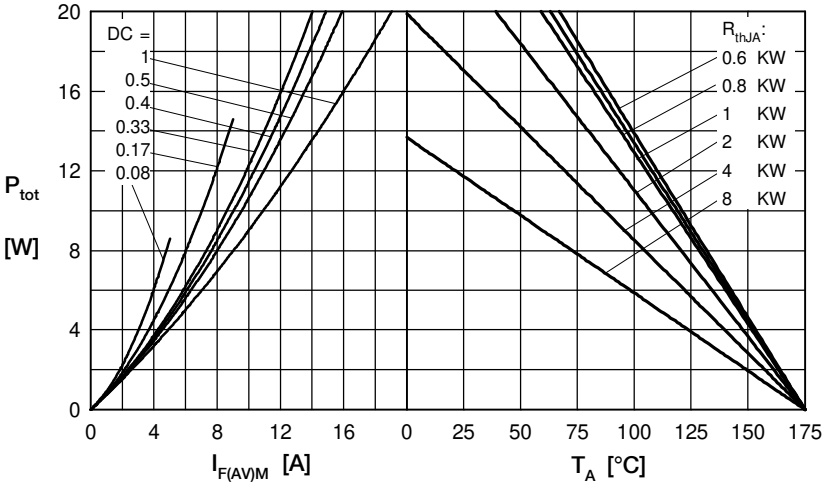


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

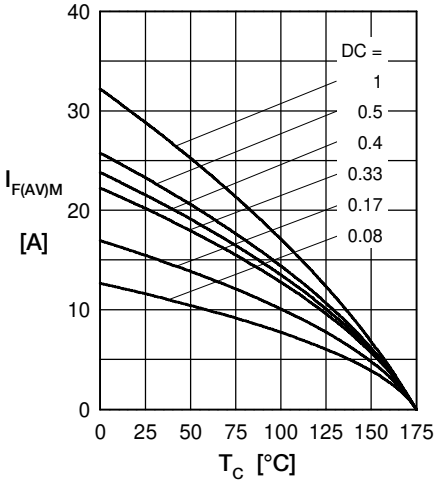


Fig. 5 Max. forward current vs. case temperature per diode

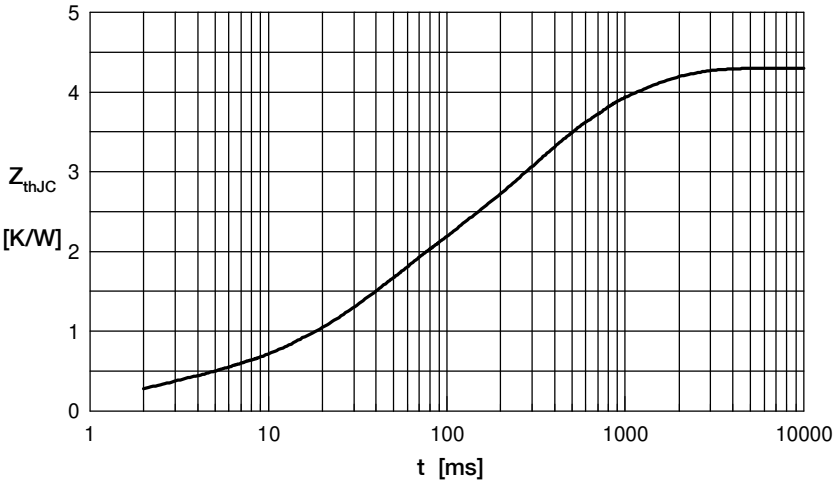


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.302	0.002
2	1.252	0.032
3	1.582	0.227
4	1.164	0.820