GD400N/Rxx Series

Standard Recovery Diodes STUD VERSION

FEATURES
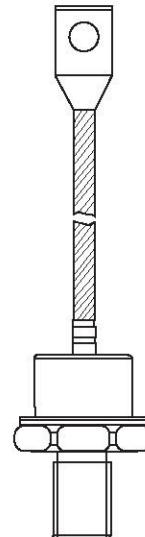
1). Wide current range

2). High voltage ratings up to 2400V

3). High surge current capabilities

4). Stud cathode and stud anode version

5). Standard JEDEC types

TYPICAL APPLICATIONS

1). Converters

2). Power supplies

3). Machine tool controls

4). High power drives

5). Medium traction applications

MAJOR RATINGS AND CHARACTERISTICS

Parameters		GD400N/R-xx	UNIT
$I_{F(AV)}$		400	A
	@ TC	120	℃
$I_{F(RMS)}$		630	A
I_{FSM}	@ 50Hz	8250	A
	@ 60Hz	8640	A
I^2t	@ 50Hz	340	KA^2s
	@ 60Hz	311	KA^2s
V_{RRM}	range	800 to 2400	V
T_J	range	40 to 190	℃

ELECTRICAL SPECIFICATIONS

1). Voltage Ratings

Type number	Voltage Code	V_{RRM}, maximum repetitive peak reverse voltage	V_{RSM}, maximum non-repetitive peak reverse voltage	I_{RRM} max. @ T_J = T_J max.
		V	V	mA
GD400N/R-xx	08	800	900	15
	12	1200	1300	
	14	1400	1500	
	16	1600	1700	
	20	2000	2100	
	24	2400	2500	

2). Forward Conduction

	Parameters	GD400N/R-xx	Unit	Conditions		
$I_{F(AV)}$	Max. average forward current	400	A	180° conduction, half sine wave		
	@ Case temperature	120	℃			
$I_{F(AV)}$	Max. average forward current	480	A	180° conduction, half sine wave		
	@ Case temperature	100	℃			
$I_{F(RMS)}$	Max. RMS forward current	630	A	DC @ 110° C case temperature		
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	8250	A	t = 10ms	No voltage	Sinusoidal half wave, Initial $T_J = T_J$ max.
		8640		t = 8.3ms	reapplied	
		6940		t = 10ms	100% V_{RRM}	
		7270		t = 8.3ms	reapplied	
I^2t	Maximum I^2t for fusing	340	KA²s	t = 10ms	No voltage	
		311		t = 8.3ms	reapplied	
		241		t = 10ms	100% V_{RRM}	
		220		t = 8.3ms	reapplied	
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	3400	KA²√S	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.80	V	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max.		
$V_{F(TO)2}$	High level value of threshold voltage	0.85		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f1}	Low level value of forward slope resistance	0.55	mΩ	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f2}	High level value of forward slope resistance	0.51		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
V_{FM}	Max. forward voltage drop	1.85	V	I_{pk}= 1200A, $T_J = 25$℃, t_p = 10ms sinusoidal wave		
T_J	Max. junction operating temperature range	-40 to 190	℃			
T_{stg}	Max. storage temperature range	-55 to 200				
R_{thJC}	Max. thermal resistance, junction to case	0.11	K/W	DC operation		
R_{thCS}	Max. thermal resistance, case to heatsink	0.04		Mounting surface, smooth, flat and greased		
T	Max. allowed mounting torque ± 10%	27	Nm	Not lubricated threads		
wt	Approximate weight	300	g	unleaded device		
	Case style	DO-9		See Outline Table		

△R_{thJC} Conduction

(The following table shows the increment of thermal resistence R_{thJC} when devices operate at different conduction angles than DC)

| Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.020	0.013	K/W	$T_J = T_J$ max.
120°	0.023	0.023		
90°	0.029	0.031		
60°	0.042	0.044		
30°	0.073	0.074		

PERFORMANCE CURVES FIGURE
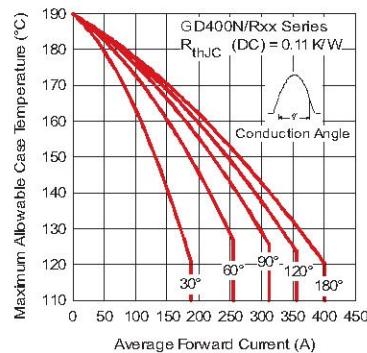
Fig. 1 - Current Ratings Characteristics
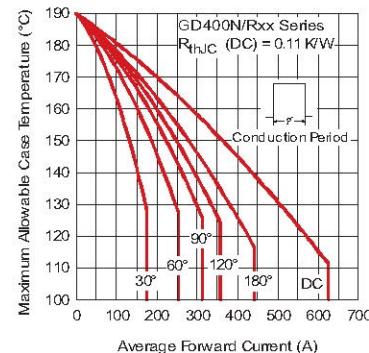
Fig. 2 - Current Ratings Characteristics
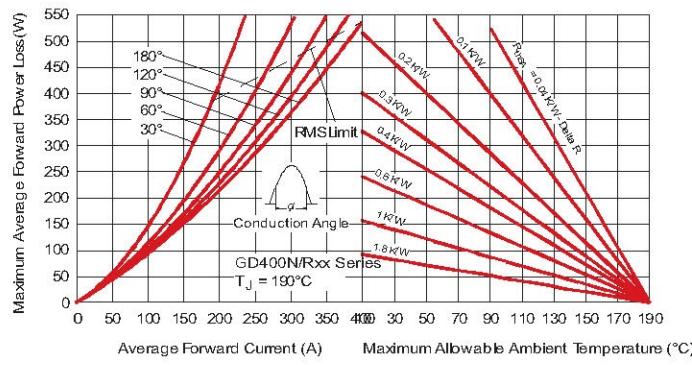
Fig. 3 - Forward Power Loss Characteristics
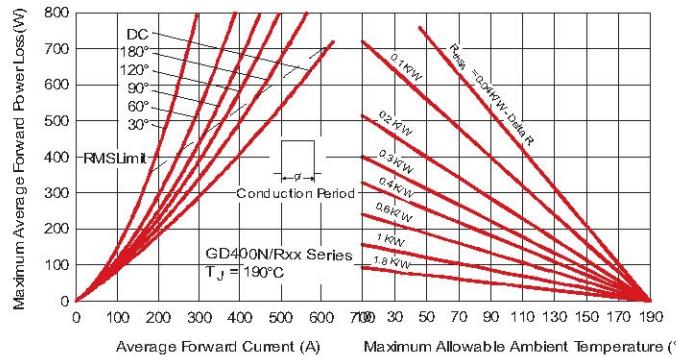
Fig. 4 - Forward Power Loss Characteristics
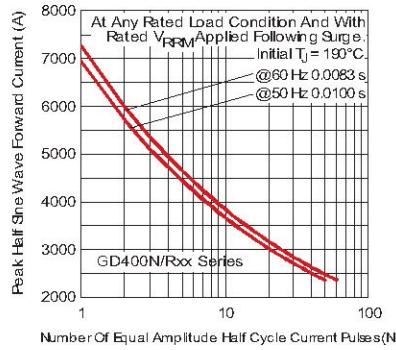
Fig. 5 - Maximum Non-Repetitive Surge Current
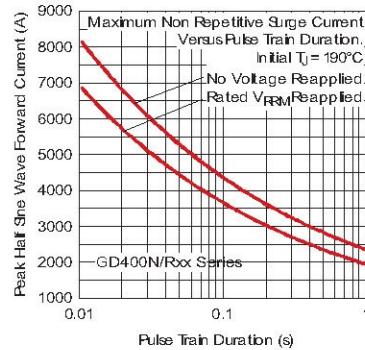
Fig. 6 - Maximum Non-Repetitive Surge Current
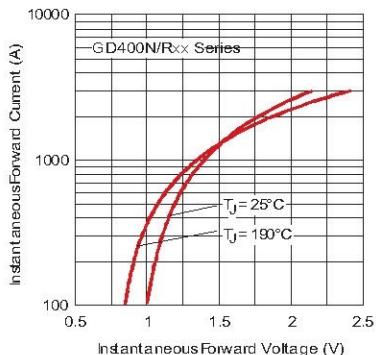
Fig. 7 - Forward Voltage Drop Characteristics
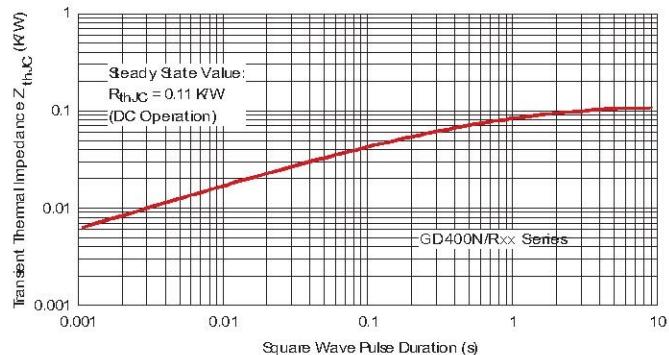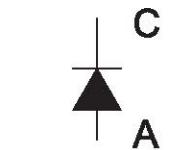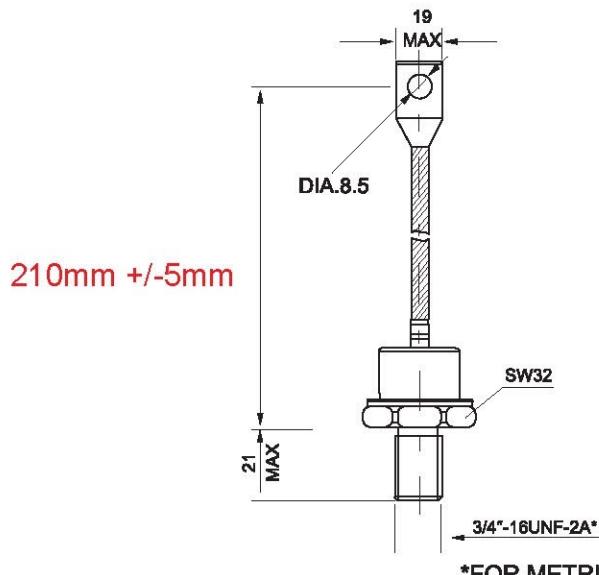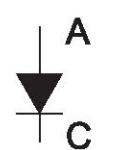
Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

OUTLINE

19 MAX

DIA.8.5

210mm +/-5mm

SW32

21 MAX

3/4"-16UNF-2A*

*FOR METRIC DEVICE

GD400N-xx

Red sleeve

GD400R-xx

Blue sleeve