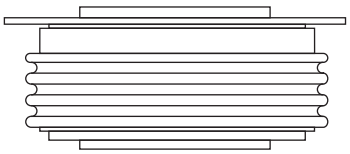
Standard Recovery Diodes (Hockey PUK Version), 5290A

FEATURES

- Wide current range
- High voltage ratings up to 3000V
- High surge current capabilities
- Diffused junction
- Hockey PUK version
- Case style B-44(R-PUK), Nell's E-type Capsule
- Lead (Pb)-free



B-44(R-PUK)
(Nell's E-type Capsule)

TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Auxiliary system supplies for traction applications

PRODUCT SUMMARY	
$I_{F(AV)}$	5290A

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNIT
$I_{F(AV)}$		5290	A
	T_{hs}	55	°C
$I_{F(RMS)}$		8300(9810)	A
	T_{hs}	55(25)	°C
I_{FSM}	50 HZ	67000	A
	60 HZ	70150	
I^2t	50 HZ	22450	kA^2s
	60 HZ	20420	
V_{RRM}		2000 to 3000	V
T_J	Typical	-40 to 160	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM}, MAXIMUM AT $T_J = T_J$ MAXIMUM mA
D5290E	20	2000	2100	100
	22	2200	2300	
	24	2400	2500	
	26	2600	2700	
	28	2800	2900	
	30	3000	3100	

FORWARD CONDUCTION						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**			**VALUES**	**UNIT**
Maximum average forward current at heatsink temperature	$I_{F(AV)}$	180° conduction, half sine wave Double side (single side) cooled			5290(2680)	A
					55(85)	°C
Maximum RMS forward current	$I_{F(RMS)}$	25°C heatsink temperature double side cooled			9810	A
Maximum peak, one cycle non-reptitive surge current	I_{FSM}	t = 10ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	67000	A
		t = 8.3ms			70150	
		t = 10ms	100%V_{RRM} reapplied		56280	
		t = 8.3ms			58920	
Maximum I^2t for fusing	I^2t	t = 10ms	No voltage reapplied		22450	kA^2s
		t = 8.3ms			20420	
		t = 10ms	100%V_{RRM} reapplied		15830	
		t = 8.3ms			14400	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			224500	$kA^2\sqrt{s}$
Maximum value of threshold voltage	$V_{F(TO)}$	I_F = 6000A, $T_J = T_J$ maximum			0.97	V
Maximum value of forward slope resistance	r_t				0.064	mΩ
Maximum forward voltage drop	V_{FM}	I_{pk} = 6000A, $T_J = T_J$ maximum, t_p = 10 ms sinusoidal wave			1.35	V

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**VALUES**	**UNIT**
Maximum junction operating temperature range	T_J		-40 to 160	°C
Maximum storage temperature range	T_{stg}		-55 to 160	
Maximum thermal resistance, junction to heatsink	$R_{thJ\text{-}hs}$	DC operation single side cooled	0.022	K/W
		DC operation double side cooled	0.011	
Mounting force, ±10%			40000 (4045)	N (kg)
Approximate weight			1100	g
Case style		B-44(R-PUK), Nell's E-type Capsule		

△ R_{thJC} CONDUCTION						
CONDUCTION ANGEL	**SINUSOIDAL CONDUCTION**		**RECTANGULAR CONDUCTION**		**TEST CONDUCTIONS**	**UNITS**
	SINGLE SIDE	**DOUBLE SIDE**	**SINGLE SIDE**	**DOUBLE SIDE**		
180°	0.0009	0.0010	0.0006	0.0006	$T_J = T_J$ maximum	K/W
120°	0.0010	0.0011	0.0010	0.0010		
90°	0.0013	0.0013	0.0014	0.0014		
60°	0.0019	0.0019	0.0020	0.0020		
30°	0.0033	0.0033	0.0034	0.0034		

Note

• The table above shows the increment of thermal resistance $R_{thJ\text{-}hs}$ when devices operate at different conduction angles than DC

Fig.1 Current ratings characteristics

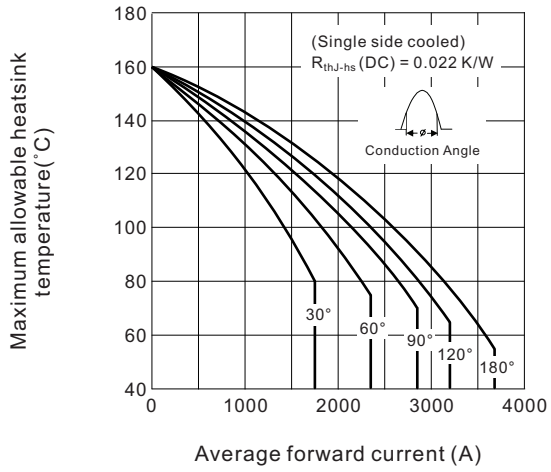


Fig.2 Current ratings characteristics

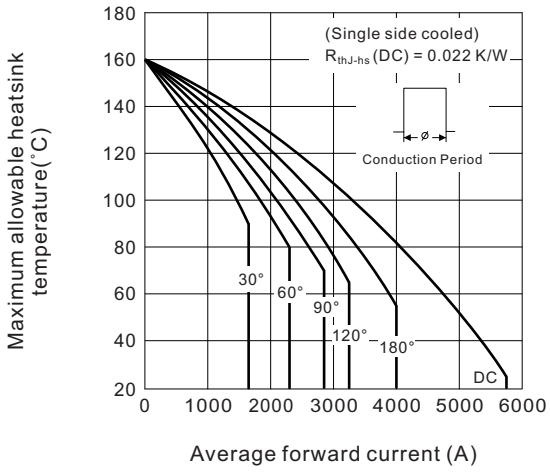


Fig.3 Current ratings characteristics

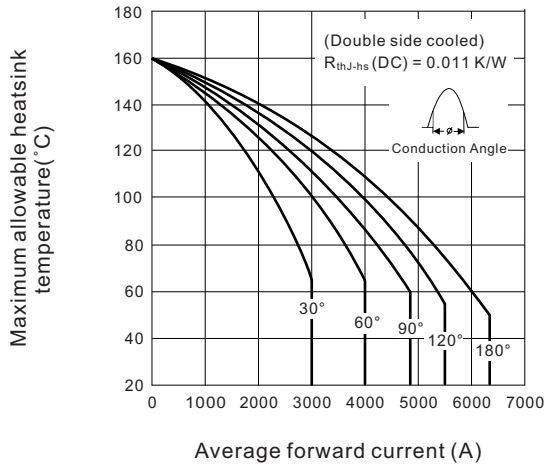


Fig.4 Current ratings characteristics

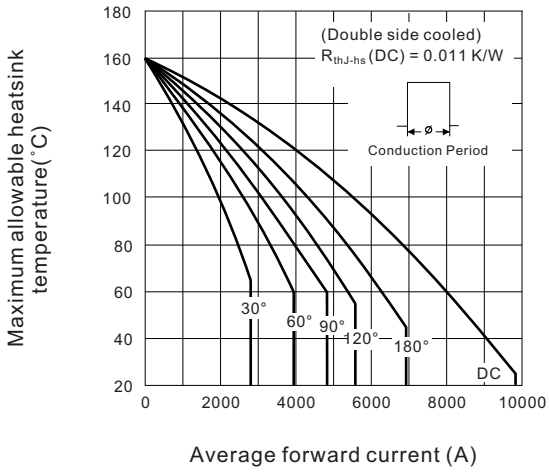


Fig.5 Forward power loss characteristics

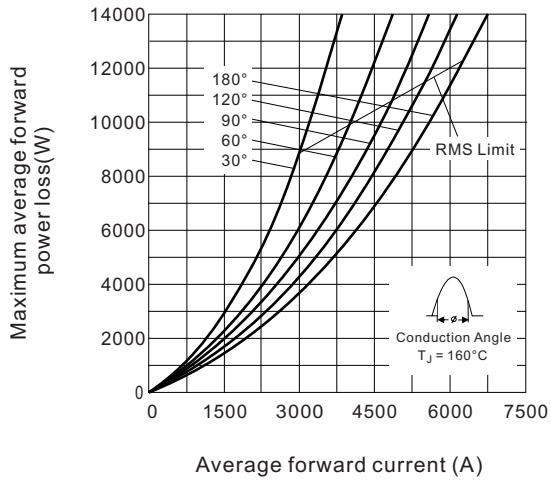


Fig.6 Forward power loss characteristics

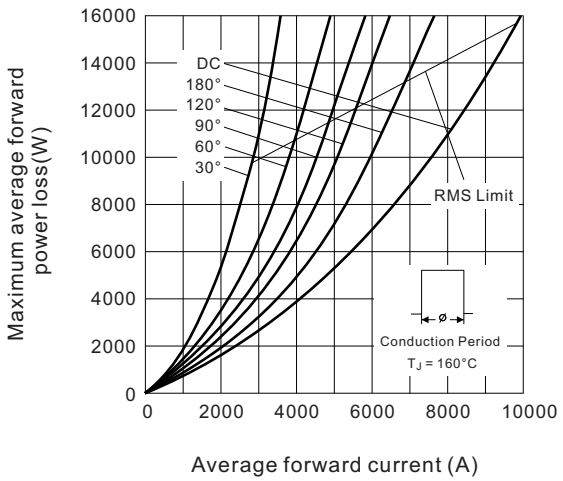


Fig.7 Maximum non-repetitive surge current single and double side cooled

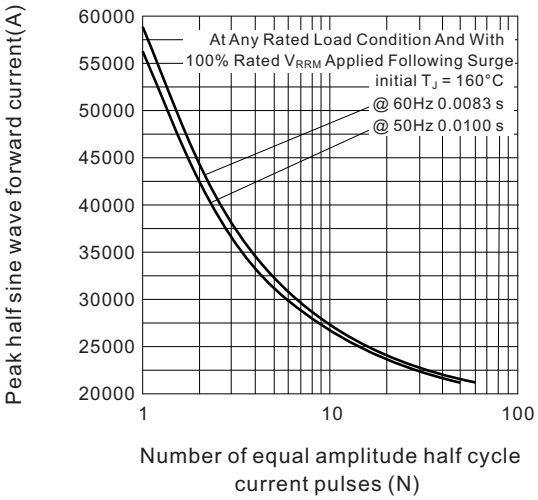


Fig.8 Maximum non-repetitive surge current single and double side cooled

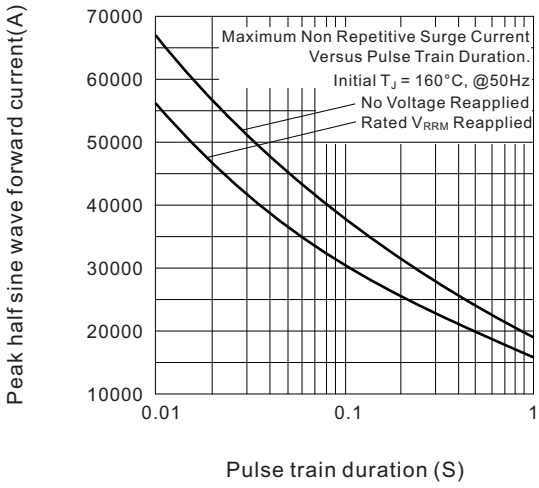


Fig.9 Forward voltage drop characteristcs

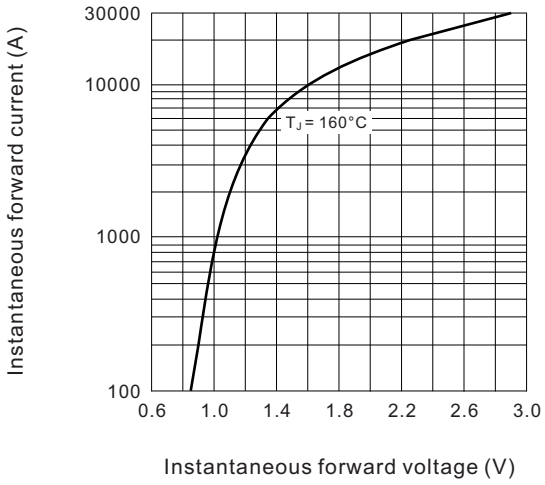
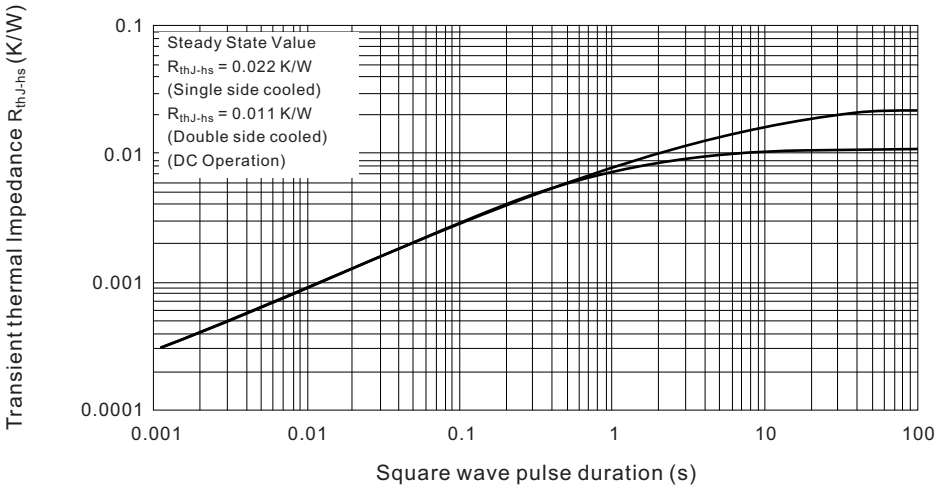


Fig.10 Thermal Impedance $R_{thJ\text{-}hs}$ characteristics



ORDERING INFORMATION TABLE

Device code	D	5290	E	20
	1	2	3	4

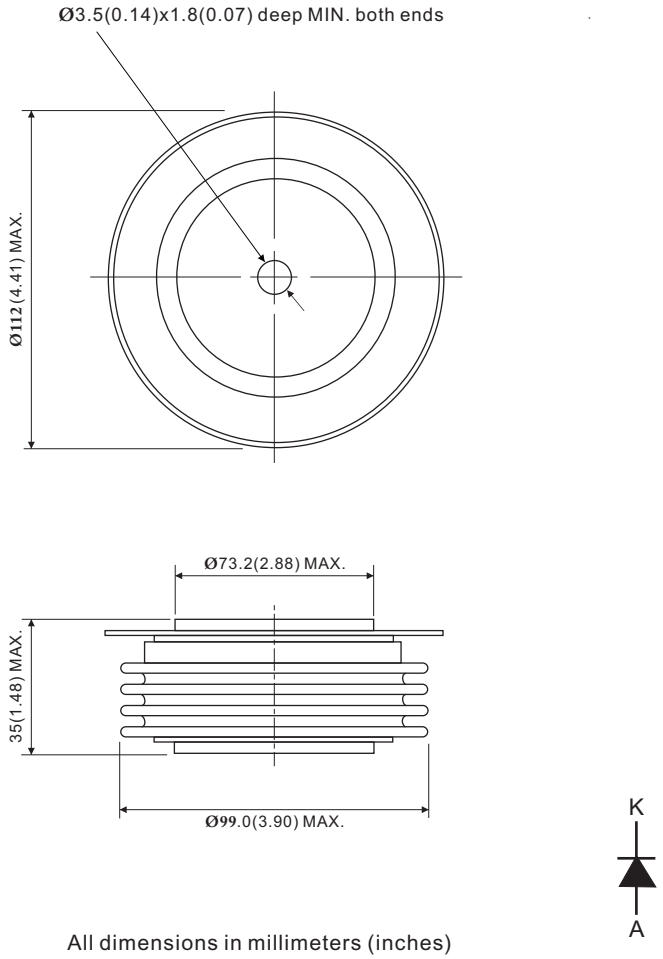
1 - "D" for standard recovery diode

2 - Maximum average forward current, "5290" for 5290A

3 - Case style : "E" for Nell's E-type Capsule, B-44(R-PUK)

4 - Voltage code, code x 100 = V_{RRM}

B-44(R-PUK), Nell's E-type Capsule



All dimensions in millimeters (inches)