

FEATURES

- Wide current range
- High voltage ratings up to 1600 V
- High surge current capabilities
- Diffused junction
- Hockey PUK version

TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications

TECHNICAL DATA

DEVICE TYPE	V_{RRM} (V)	V_{RSM} (V)
DS804SE1414	1400	1500
DS804SE1616	1600	1700
DS804SE1818	1800	1900

High V_{RRM} available upto 3200 V on request



MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	DS 804		UNITS
		04 TO 20	25 TO 32	
$I_{F(AV)}$		1400	1100	A
	T_{hs}	55	55	°C
$I_{F(RMS)}$		2500	2000	A
	T_{hs}	25	25	°C
I_{FSM}	50 Hz	13 000	10 500	A
	60 Hz	13 600	11 000	
I^2t	50 Hz	846	551	kA ² s
	60 Hz	772	503	
V_{RRM}	Range	400 to 2000	2500 to 3200	V
T_J		- 40 to 180	- 40 to 150	°C

FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS		DS 804		UNITS	
				04 TO 20	25 TO 32		
Maximum average forward current at heatsink temperature	$I_{F(AV)}$	180° conduction, half sine wave Double side (single side) cooled		1400 (795)	1100 (550)	A	
				55 (85)	55 (85)	°C	
Maximum RMS forward current	$I_{F(RMS)}$	25 °C heatsink temperature double side cooled		2500	2000		
Maximum peak, one-cycle forward, non-repetitive current	I_{FSM}	t = 10 ms	No voltage reappplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	13 000	10 500	A
		t = 8.3 ms			13 600	11 000	
		t = 10 ms	100 % V_{RRM} reappplied		10 930	8830	
		t = 8.3 ms			11 450	9250	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reappplied		846	551	kA ² s
		t = 8.3 ms			772	503	
		t = 10 ms	100 % V_{RRM} reappplied		598	390	
		t = 8.3 ms			546	356	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		8460	5510	kA ² √s	
Low level value of threshold voltage	$V_{F(TO)1}$	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		0.78	0.84	V	
High level value of threshold voltage	$V_{F(TO)2}$	$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		0.94	0.88		
Low level value of forward slope resistance	r_{f1}	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		0.35	0.40	mΩ	
High level value of forward slope resistance	r_{f2}	$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		0.26	0.38		
Maximum forward voltage drop	V_{FM}	$I_{pk} = 1500$ A, $T_J = T_J$ maximum $t_p = 10$ ms sinusoidal wave		1.31	1.44	V	

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		DS 804		UNITS
				04 TO 20	25 TO 32	
Maximum junction operating temperature range	T_J			- 40 to 180	- 40 to 150	°C
Maximum storage temperature range	T_{Stg}			- 55 to 200		
Maximum thermal resistance, junction to heatsink	R_{thJ-hs}	DC operation single side cooled		0.076		K/W
		DC operation double side cooled		0.038		
Mounting force, ± 10 %				9800 (1000)		N (kg)
Approximate weight				83		g
Case style		See dimensions - link at the end of datasheet		B-43		

ΔR_{thJ-hs} CONDUCTION						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.007	0.007	0.005	0.005	$T_J = T_J$ maximum	K/W
120°	0.008	0.008	0.008	0.008		
90°	0.010	0.010	0.011	0.011		
60°	0.015	0.015	0.016	0.016		
30°	0.026	0.026	0.026	0.026		

Note

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

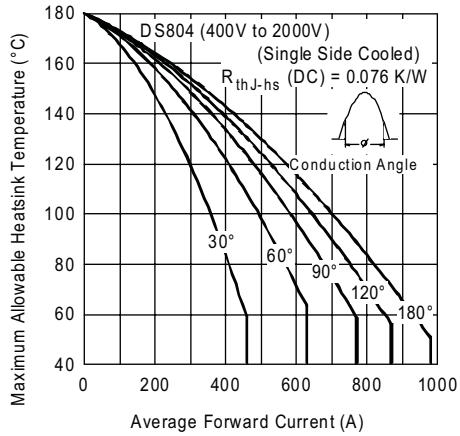


Fig. 1 - Current Ratings Characteristics

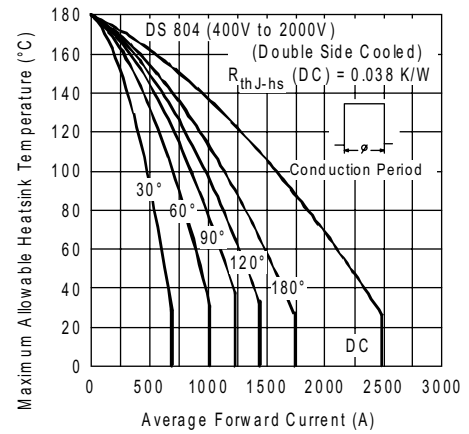


Fig. 4 - Current Ratings Characteristics

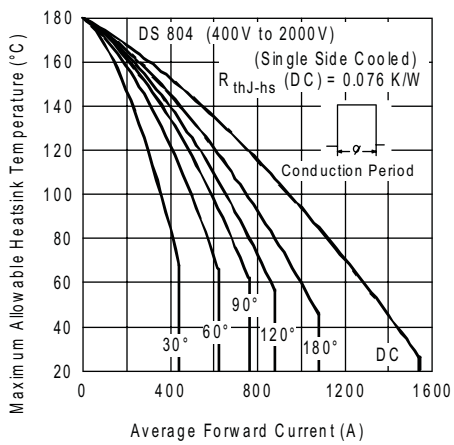


Fig. 2 - Current Ratings Characteristics

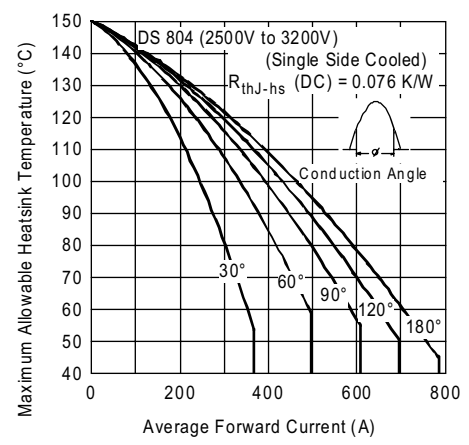


Fig. 5 - Current Ratings Characteristics

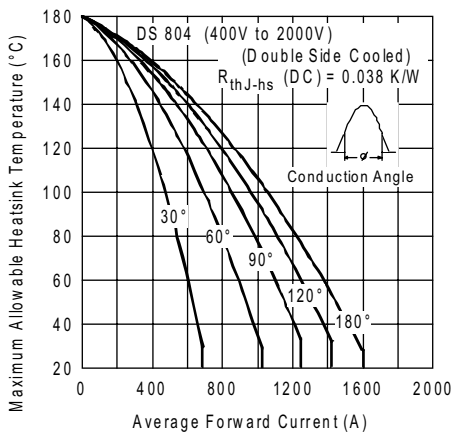


Fig. 3 - Current Ratings Characteristics

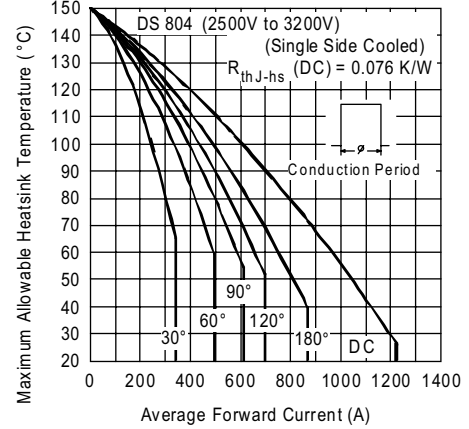


Fig. 6 - Current Ratings Characteristics

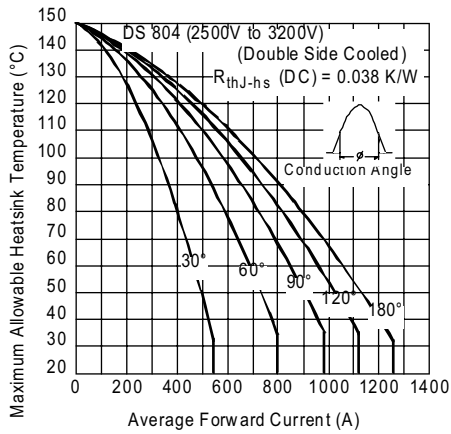


Fig. 7 - Current Ratings Characteristics

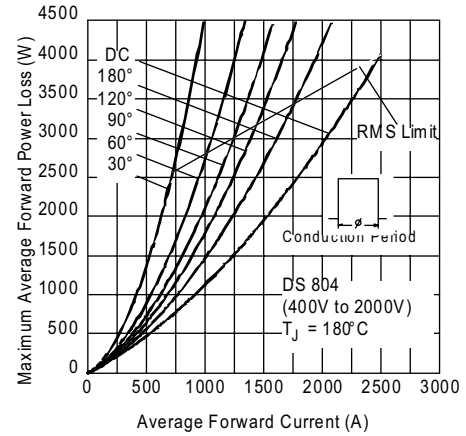


Fig. 10 - Forward Power Loss Characteristics

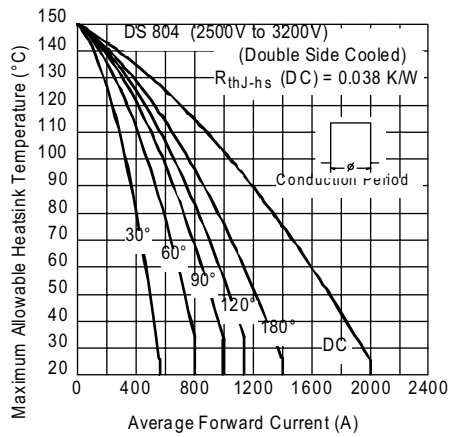


Fig. 8 - Current Ratings Characteristics

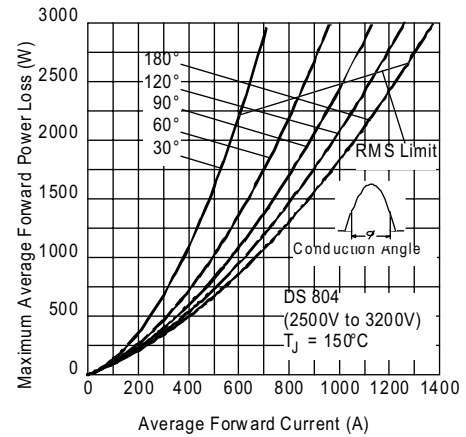


Fig. 11 - Forward Power Loss Characteristics

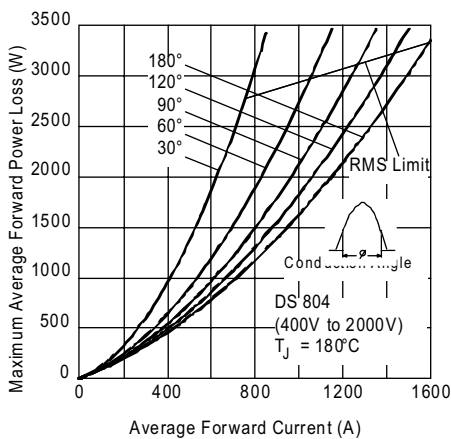


Fig. 9 - Forward Power Loss Characteristics

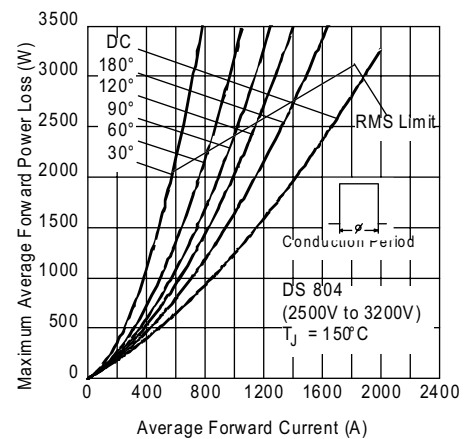


Fig. 12 - Forward Power Loss Characteristics

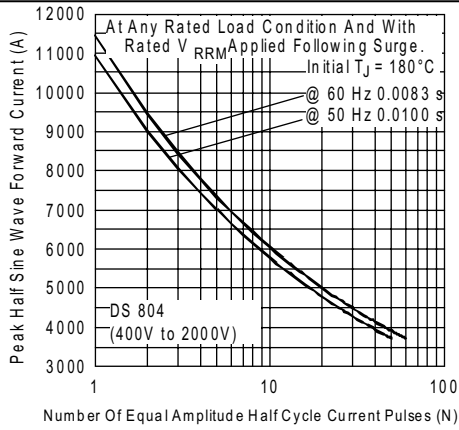


Fig. 13 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

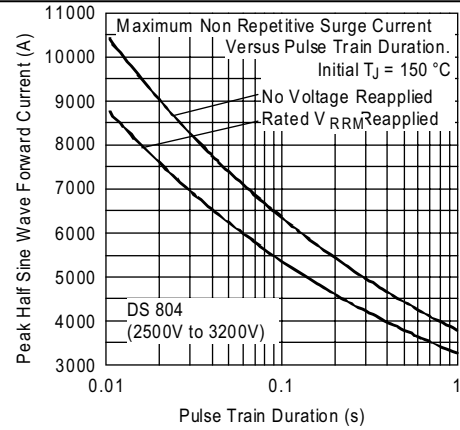


Fig. 16 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

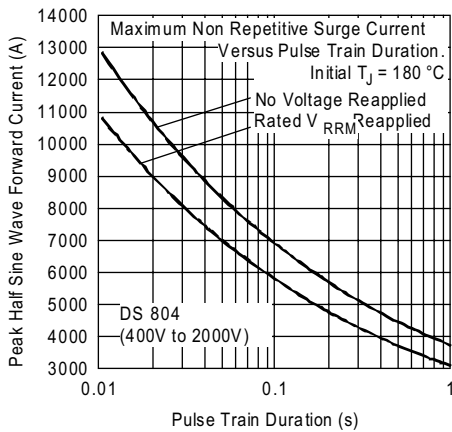


Fig. 14 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

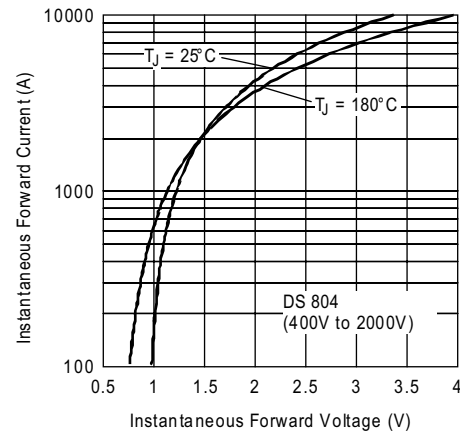


Fig. 17 - Forward Voltage Drop Characteristics

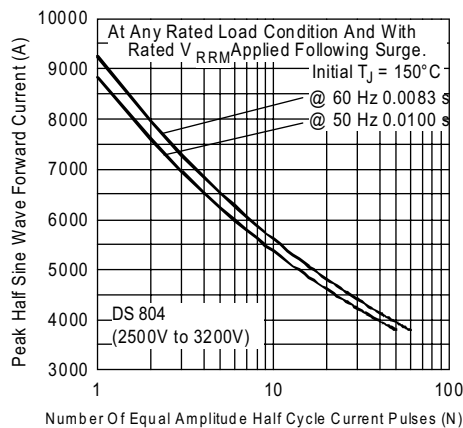


Fig. 15 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

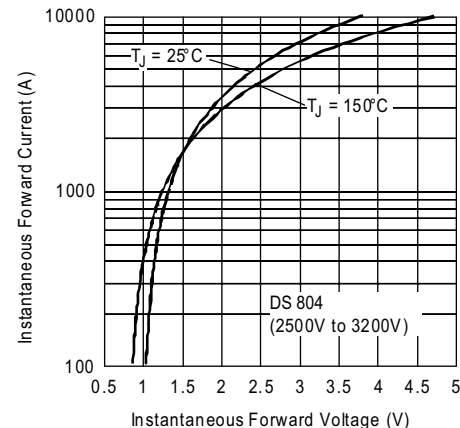


Fig. 18 - Forward Voltage Drop Characteristics

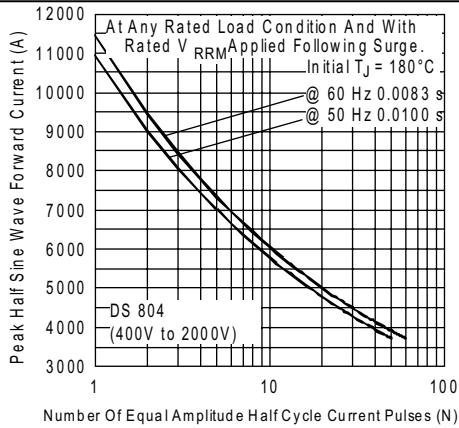


Fig. 13 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

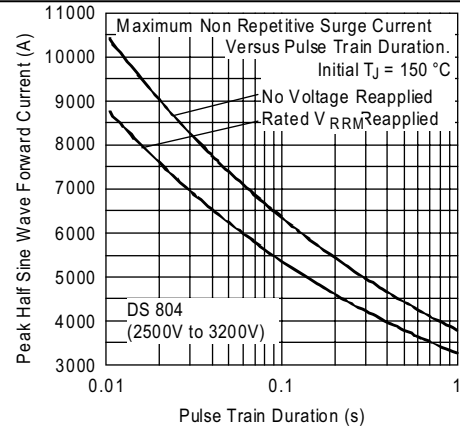


Fig. 16 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

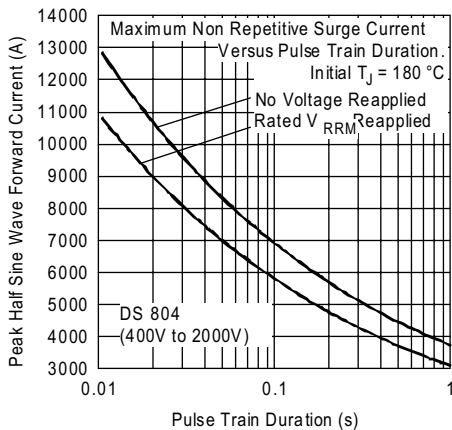


Fig. 14 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

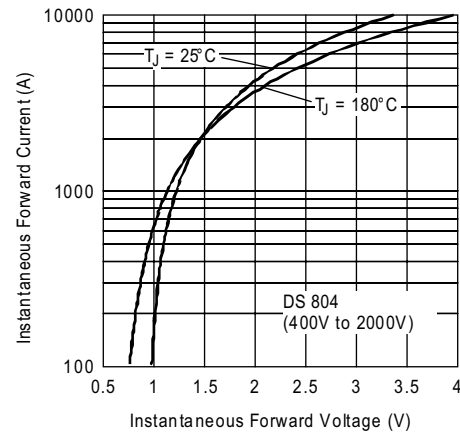


Fig. 17 - Forward Voltage Drop Characteristics

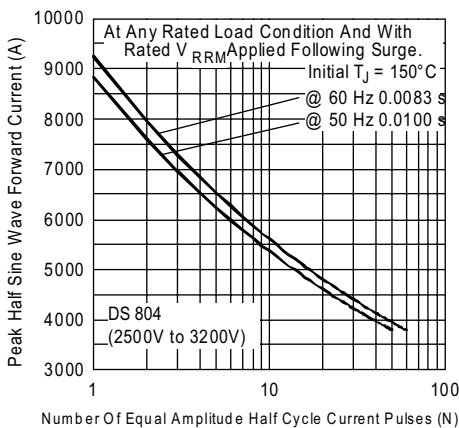


Fig. 15 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

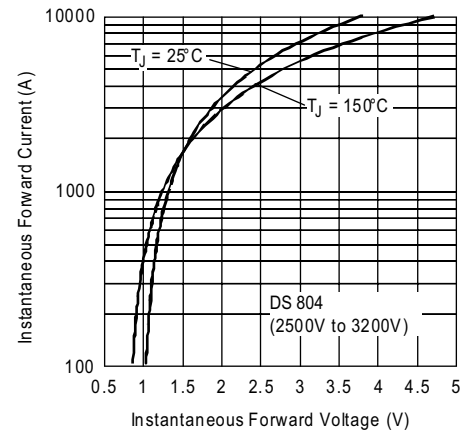
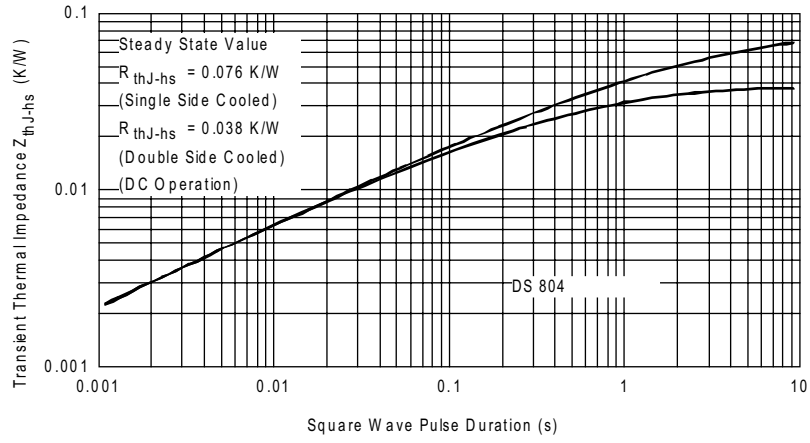
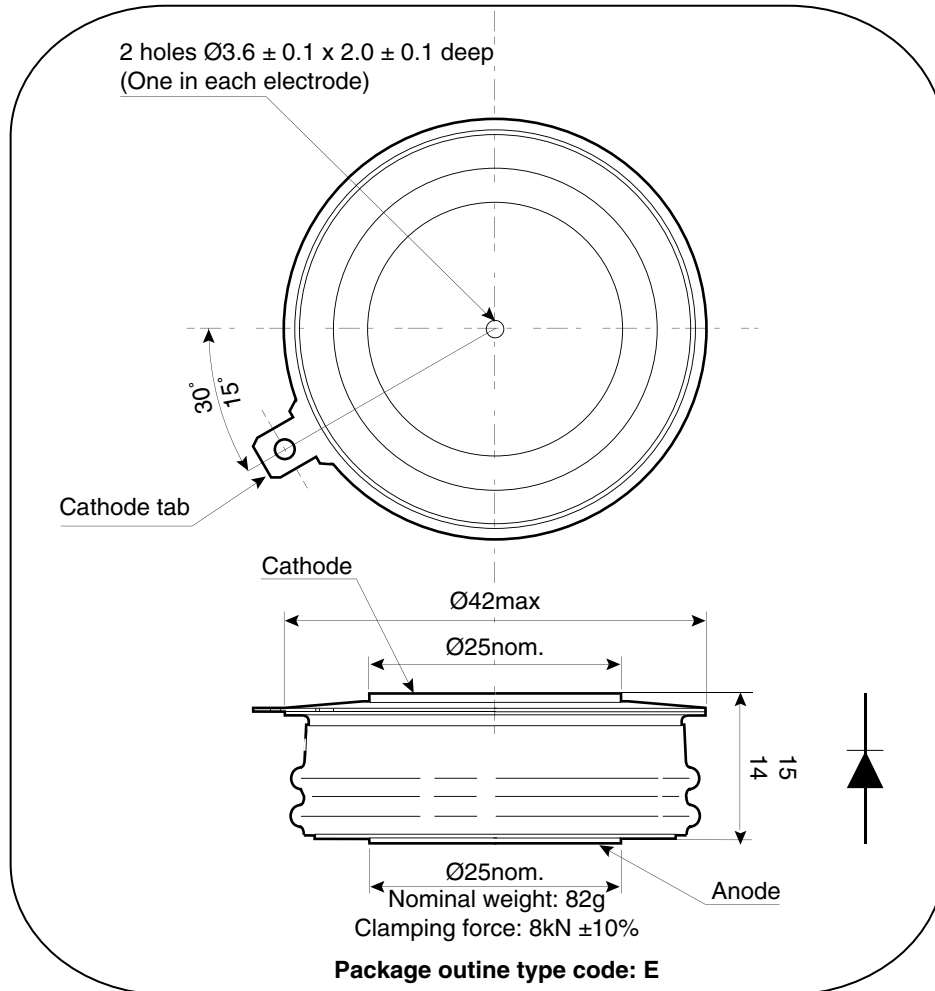


Fig. 18 - Forward Voltage Drop Characteristics



PACKAGE OUTLINE



All dimensions are in mm.

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(An ISO 9001:2015, ISO 14001:2015 Certified Company)

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