

FAST RECOVERY DIODES

Hockey Puk Version

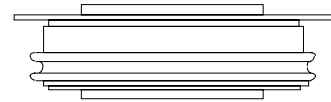
Features

- High power FAST recovery diode series
- 1.0 to 1.5 μ s recovery time
- High voltage ratings up to 1600V
- High current capability
- Optimized turn on and turn off characteristics
- Low forward recovery
- Fast and soft reverse recovery
- Press-puk encapsulation
- Case style conform to JEDEC B-43
- Maximum junction temperature 125°C
- RoHS Compliant

Typical Applications

- Snubber diode for GTO
- High voltage free-wheeling diode
- Fast recovery rectifier applications

845A



case style B-43

Major Ratings and Characteristics

Parameters	SD803C..C	Units
$I_{F(AV)}$	845	A
@ T_{hs}	55	°C
$I_{F(RMS)}$	1326	A
@ T_{hs}	25	°C
I_{FSM} @ 50Hz	11295	A
@ 60Hz	11830	A
I^2t @ 50Hz	640	KA ² s
@ 60Hz	583	KA ² s
V_{RRM} range	400 to 1600	V
t_{rr} range	1.0 to 1.5	μ s
@ T_j	25	°C
T_j	- 40 to 125	°C

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V _{RRM} max. repetitive peak and off-state voltage V	V _{RSM} , maximum non-repetitive peak voltage V	I _{RRM} max. T _J = 125°C mA
SD803C..S10C	04	400	500	45
	08	800	900	
	10	1000	1100	
SD803C..S15C	12	1200	1300	
	14	1400	1500	
	16	1600	1700	

Forward Conduction

Parameter	SD803C..C	Units	Conditions
I _{F(AV)} Max. average forward current @ Heatsink temperature	845(420)	A	180° conduction, half sine wave.
	55(75)	°C	Double side (single side) cooled
I _{F(RMS)} Max. RMS current	1326	A	@ 25°C heatsink temperature double side cooled
I _{FSM} Max. peak, one-cycle non-repetitive forward current	11295	A	t = 10ms No voltage
	11830		t = 8.3ms reappplied
	9500		t = 10ms 100% V _{RRM}
	9945		t = 8.3ms reappplied
I ² t Maximum I ² t for fusing	640	KA ² s	t = 10ms No voltage
	583		t = 8.3ms reappplied
	451		t = 10ms 100% V _{RRM}
	412		t = 8.3ms reappplied
I ² √t Maximum I ² √t for fusing	6400	KA ² √s	t = 0.1 to 10ms, no voltage reappplied
V _{F(TO)1} Low level of threshold voltage	1.02	V	(16.7% × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J max.
V _{F(TO)2} High level of threshold voltage	1.32		(I > π × I _{F(AV)}), T _J = T _J max.
r _{f1} Low level of forward slope resistance	0.38	mΩ	(16.7% × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J max.
r _{f2} High level of forward slope resistance	0.28		(I > π × I _{F(AV)}), T _J = T _J max.
V _{FM} Max. forward voltage	1.89	V	I _{pk} = 2655A, T _J = 25°C, t _p = 10ms sinusoidal wave

Recovery Characteristics

Code	T _J = 25°C typical t _{rr} @ 25% I _{RRM} (μs)	Testconditions			Max. values @ T _J = 125°C			
		I _{pk} Square Pulse (A)	di/dt (A/μs)	V _r (V)	t _{rr} @ 25% I _{RRM} (μs)	Q _{rr} (μC)	I _{rr} (A)	
S10	1.0	1000	25	-30	2.0	45	34	
S15	1.5				3.2	87	51	

Thermal and Mechanical Specifications

Parameter	SD803C..C	Units	Conditions
T _J Max. operating temperature range	-40 to 125	°C	
T _{stg} Max. storage temperature range	-40 to 150		
R _{thJ-hs} Max. thermal resistance, junction to heatsink	0.076 0.038	K/W	DC operation single side cooled DC operation double side cooled
F Mounting force, ± 10%	9800 (1000)	N (Kg)	
wt Approximate weight	83	g	
Case style	B-43		See Outline Table

ΔR_{thJ-hs} Conduction

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

Conduction angle	Sinusoidal conduction		Rectangular conduction		Units	Conditions
	Single Side	Double Side	Single Side	Double Side		
180°	0.006	0.007	0.005	0.005	K/W	T _J = T _J max.
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		

Ordering Information Table

Device Code

SD	80	3	C	16	S15	C
①	②	③	④	⑤	⑥	⑦

- 1** - Diode
- 2** - Essential part number
- 3** - 3 = Fast recovery
- 4** - C = Ceramic Puk
- 5** - Voltage code: Code x 100 = V_{RRM} (see Voltage Ratings table)
- 6** - t_{rr} code (see Recovery Characteristics table)
- 7** - C = Puk Case B-43

Outline Table

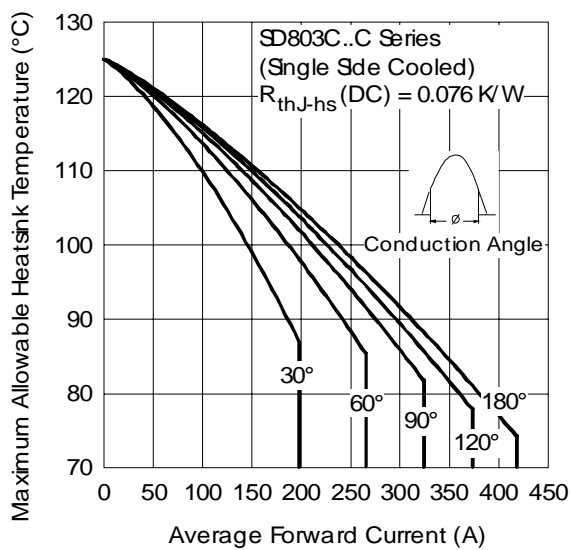
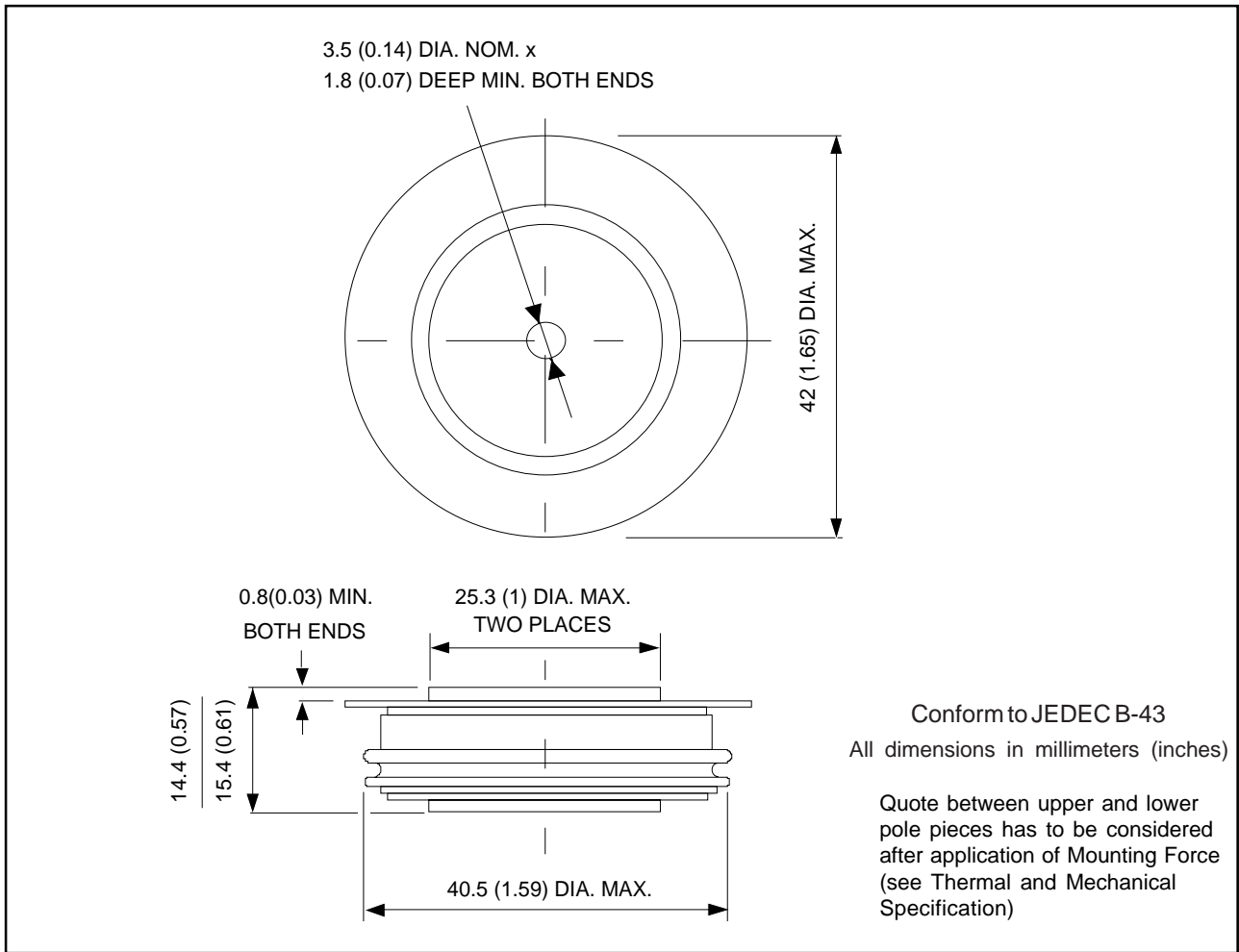


Fig. 1 - Current Ratings Characteristics

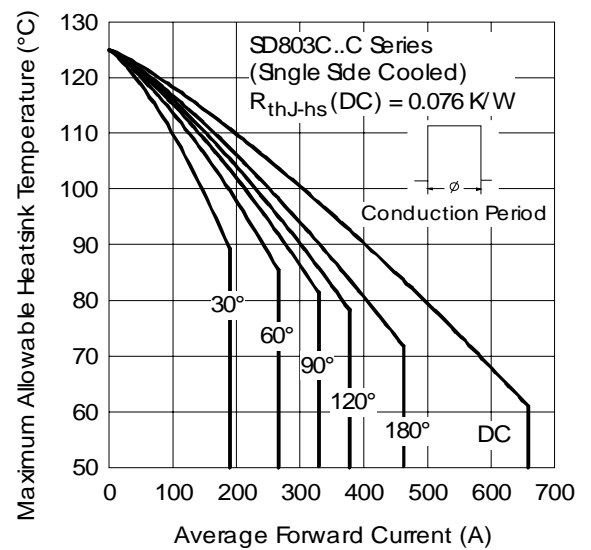


Fig. 2 - Current Ratings Characteristics

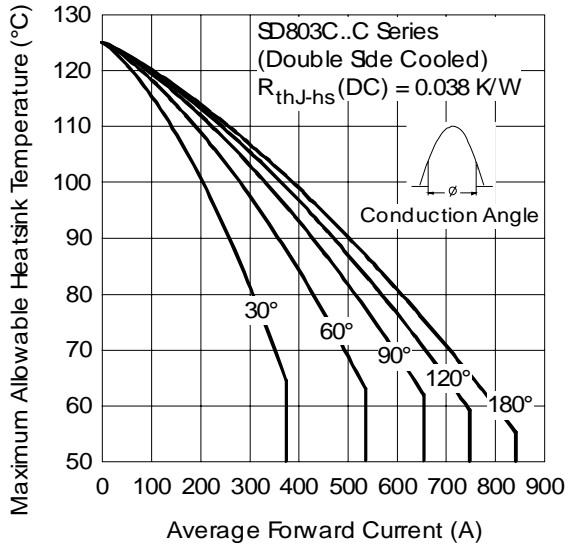


Fig. 3 - Current Ratings Characteristics

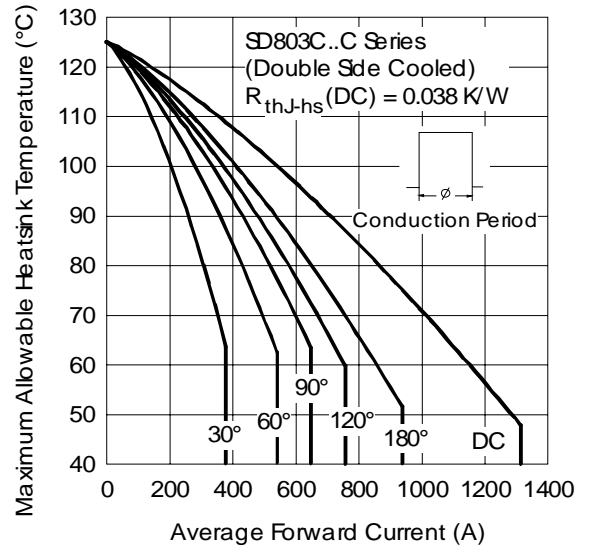


Fig. 4 - Current Ratings Characteristics

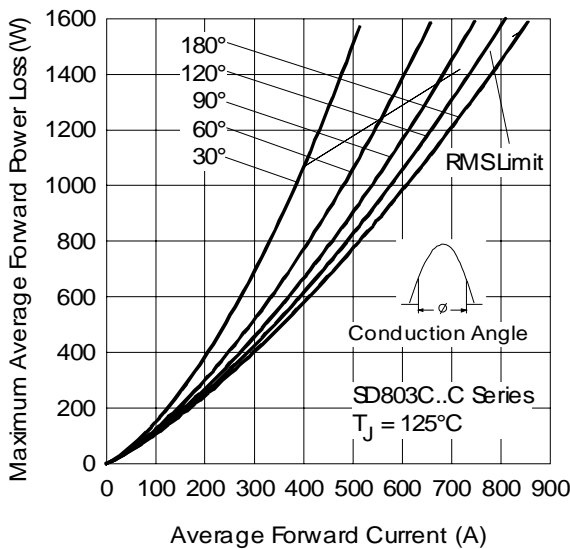


Fig. 5 - Forward Power Loss Characteristics

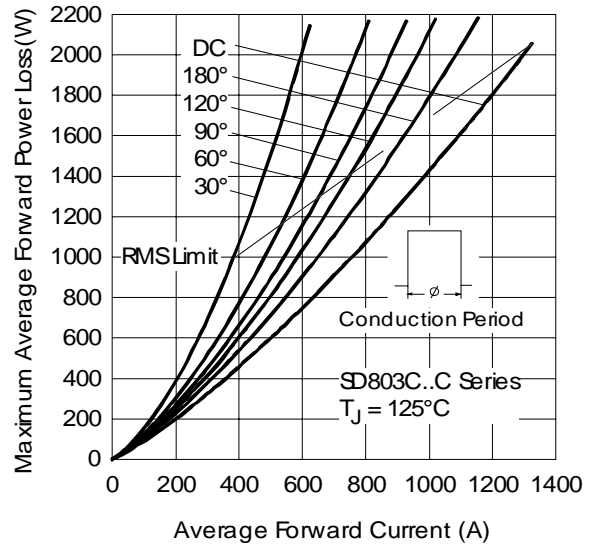


Fig. 6 - Forward Power Loss Characteristics

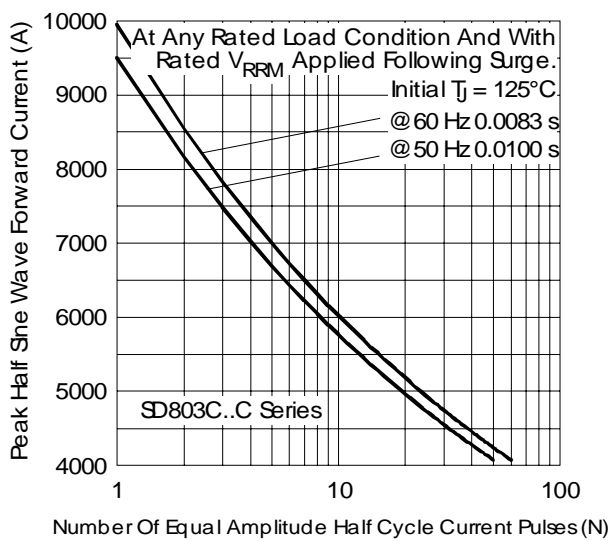


Fig. 7 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

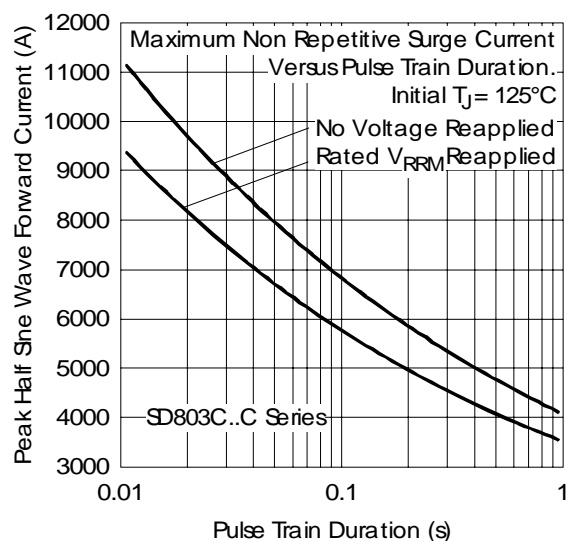


Fig. 8 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

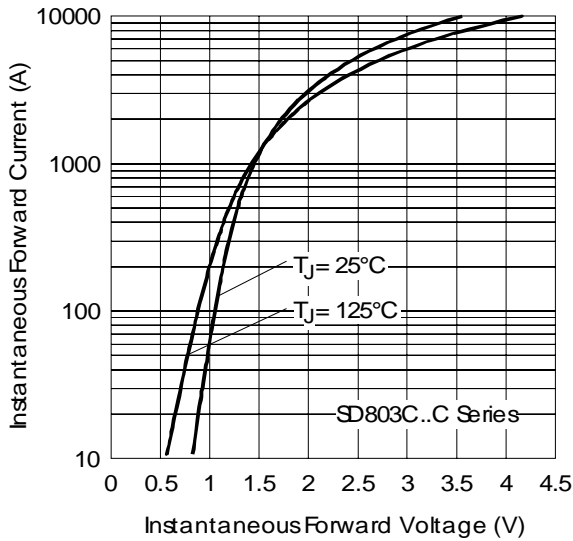


Fig. 9 - Forward Voltage Drop Characteristics

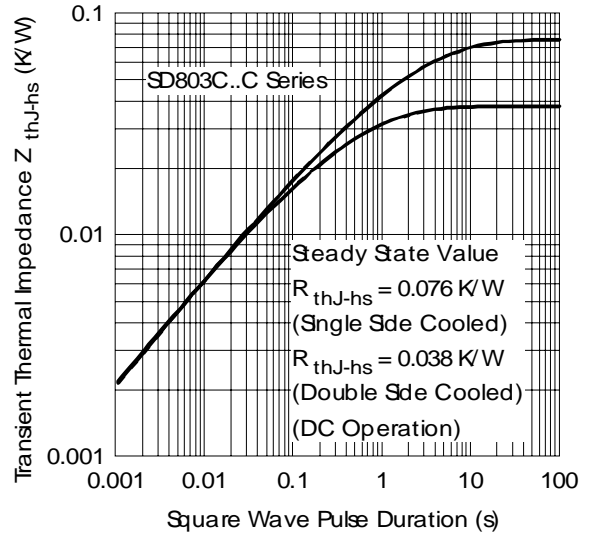


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristic

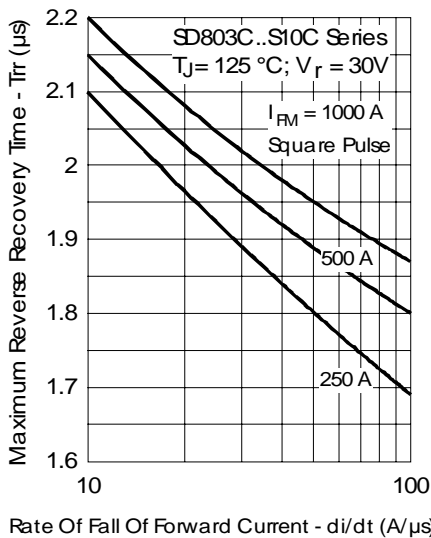


Fig. 11 - Recovery Time Characteristics

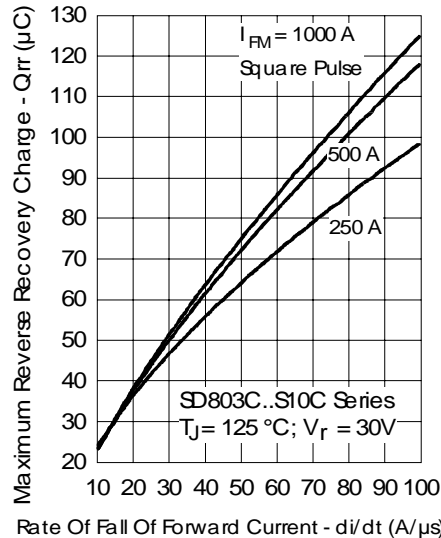


Fig. 12 - Recovery Charge Characteristics

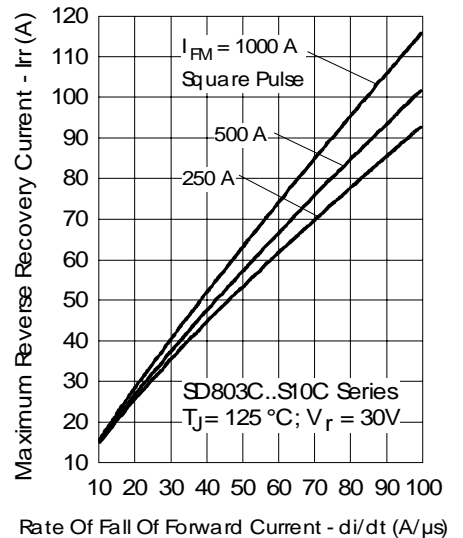


Fig. 13 - Recovery Current Characteristics

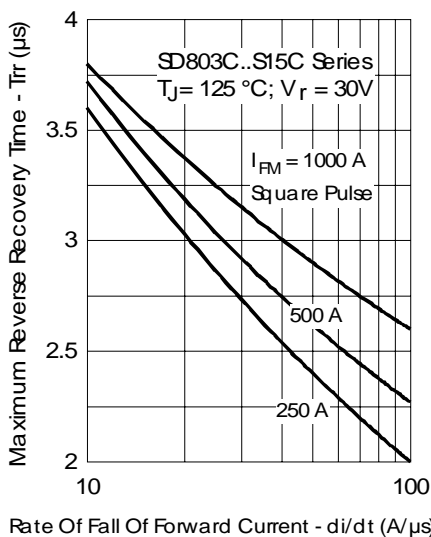


Fig. 14 - Recovery Time Characteristics

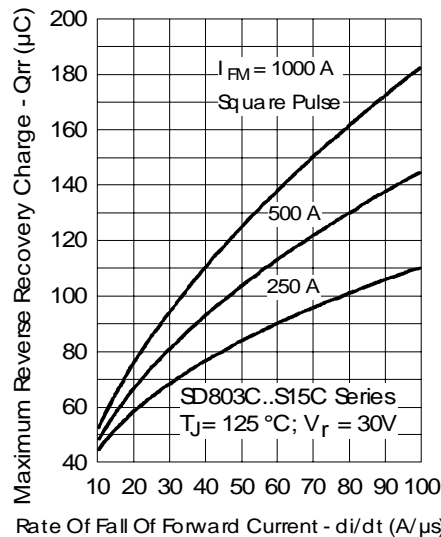


Fig. 15 - Recovery Charge Characteristics

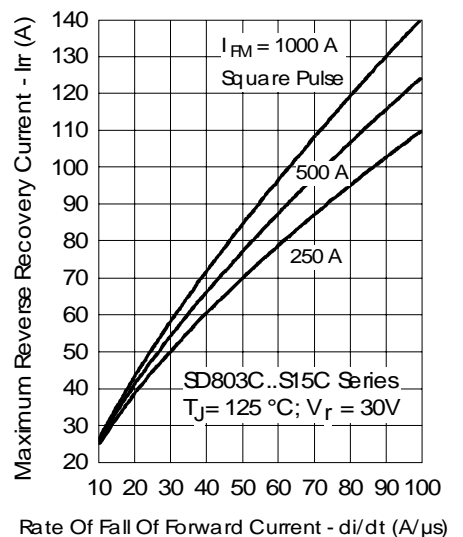


Fig. 16 - Recovery Current Characteristics

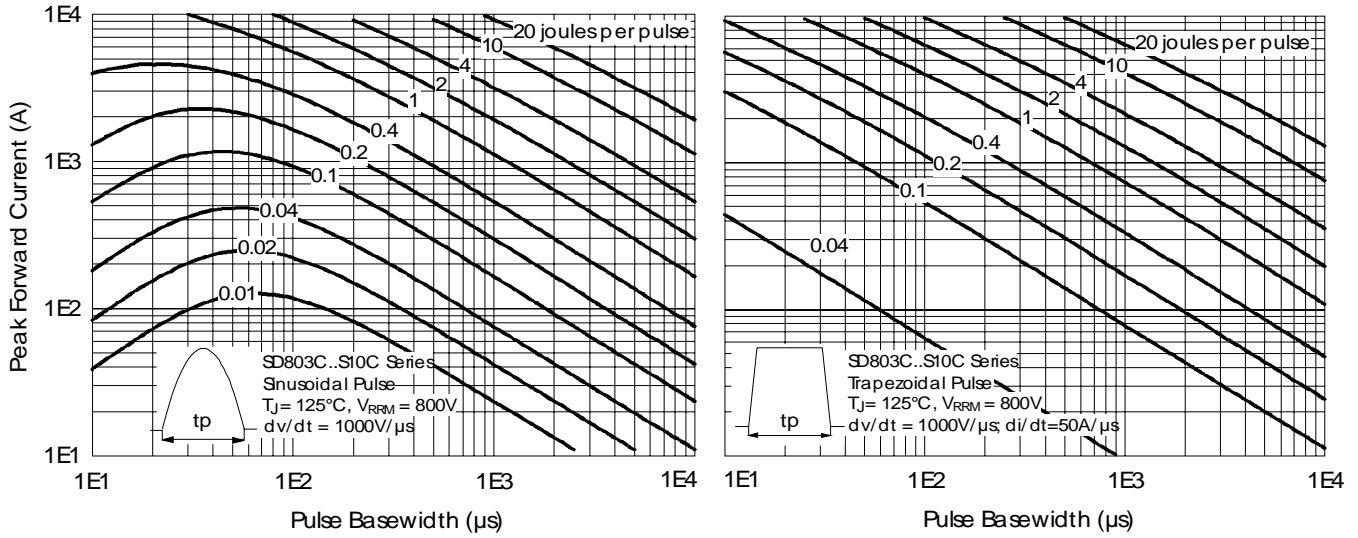


Fig. 17 - Maximum Total Energy Loss Per Pulse Characteristics

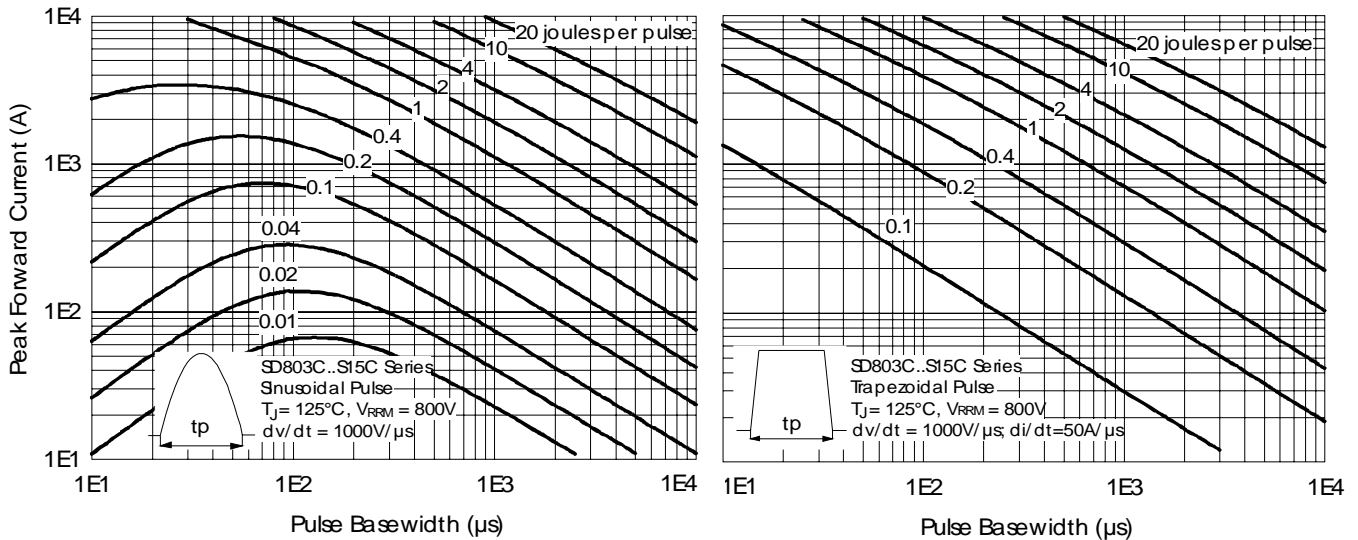


Fig. 18 - Maximum Total Energy Loss Per Pulse Characteristics

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.