

FAST RECOVERY DIODES

Hockey Puk Version

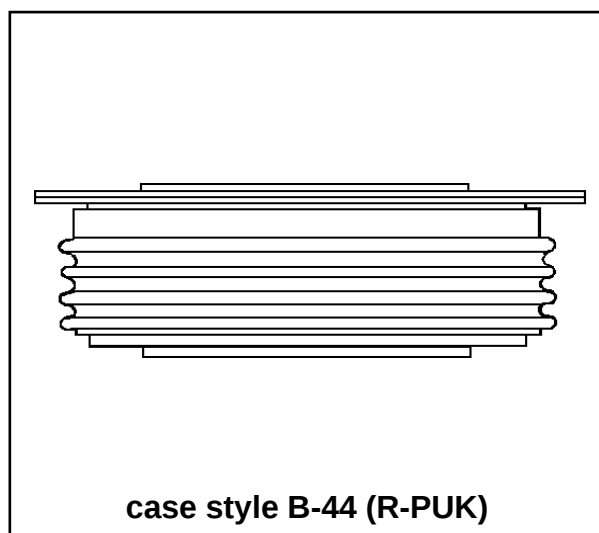
Features

- High power FAST rectifier diode series
- 2.0 μ s recovery time
- High voltage ratings up to 2500 V
- High current capability
- Optimized turn on and turn off characteristics
- Low forward recovery
- Fast and soft reverse recovery
- Press-puk encapsulation
- Case style B-44 (R-PUK)
- Maximum junction temperature 125°C

3500 A

Typical Applications

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



Major Ratings and Characteristics

Parameters	SD3553C..S20R	Units
$I_{F(AV)}$	3500	A
@ T_{hs}	55	°C
$I_{F(RMS)}$	6540	A
@ T_{hs}	25	°C
I_{FSM}	@ 50Hz	47 KA
	@ 60Hz	50 KA
I^2t	@ 50Hz	11045 KA ² s
	@ 60Hz	10375 KA ² s
$I^2\sqrt{t}$		110450 KA ² $\sqrt{s}$
V_{DRM}/V_{RRM} range	1600 to 2500	V
t_{rr}	2.0	μ s
@ T_J	25	°C
T_J range	-40 to 150	°C

ELECTRICAL SPECIFICATIONS**Voltage Ratings**

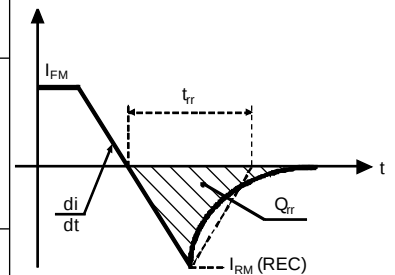
Type number	Voltage Code	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ $T_J = 150^\circ\text{C}$ mA
SD3553C..S20R	16	1600	1700	100
	20	2000	2100	
	25	2500	2600	

Forward Conduction

Parameter	SD3553C..R	Units	Conditions
$I_{F(AV)}$ Maximum average forward current @ Heatsink temperature	3500 (1690)	A	180° conduction, half sine wave
	55 (85)	°C	Double side (single side) cooled
$I_{F(RMS)}$ Maximum RMS forward current	6540	A	@ 25°C heatsink temp. double side cooled
I_{FSM} Maximum peak, one-cycle forward, non-repetitive surge current	47.0	KA	t = 10ms No voltage
	50.0		t = 8.3ms reappplied
	40.2		t = 10ms 100% V_{RRM}
	42.6		t = 8.3ms reappplied
I^2t Maximum I^2t for fusing	11045	KA ² s	t = 10ms No voltage
	10375		t = 8.3ms reappplied
	8080		t = 10ms 50% V_{RRM}
	7531		t = 8.3ms reappplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	110450	KA ² √s	t = 0.1 to 10ms, no voltage reappplied
$V_{F(TO)1}$ Low level value of threshold voltage	1.082	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J \text{ max.}$
$V_{F(TO)2}$ High level value of threshold voltage	0.160		$(\pi \times I_{F(AV)} < I < 20 \times \pi \times I_{F(AV)})$, $T_J = T_J \text{ max.}$
r_{f1} Low level value of forward slope resistance	1.174	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J \text{ max.}$
r_{f2} High level value of forward slope resistance	0.152		$(\pi \times I_{F(AV)} < I < 20 \times \pi \times I_{F(AV)})$, $T_J = T_J \text{ max.}$
V_{FM} Maximum forward voltage drop	2.04	V	$T_J = 150^\circ\text{C}$, $I_{FM} = 6000\text{A}$

Recovery Characteristics

Code	$T_J = 25^\circ\text{C}$ Typical T_{rr} @ 25% I_{RRM} (μs)	Test Conditions			Max. values @ $T_J = 150^\circ\text{C}$		
		I_{pk} Square Pulse (A)	di/dt (A/μs)	V_r (V)	t_{rr} @ 25% I_{RRM} (μs)	Q_{rr} (μC)	I_{rr} (A)
S20	2.0	1000	60	-50	5.50	1000	200



Thermal and Mechanical Specifications

Parameter	SD3553C..R	Units	Conditions
T_J Max. junction operating temperature range	- 40 to 150	°C	
T_{stg} Max. storage temperature range	- 40 to 150		
R_{thJ-hs} Max. thermal resistance, junction to heatsink	0.02	K/W	DC operation single side cooled
	0.01		DC operation double side cooled
F Mounting force, $\pm 10\%$	39200 (4000)	N (Kg)	
wt Approximate weight	1590	g	
Case style	B-44 (R-PUK)		See outline table

 ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistance R_{thJC} 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°	0.0009	0.0010	0.0006	0.0006	K/W	$T_J = T_J \text{ max.}$
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		

Ordering Information Table

Device Code

SD	355	3	C	25	S20	R
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** - K = Puk Case B-44 (R-PUK)

Outline Table

