

# Dual Fast Recovery Diode

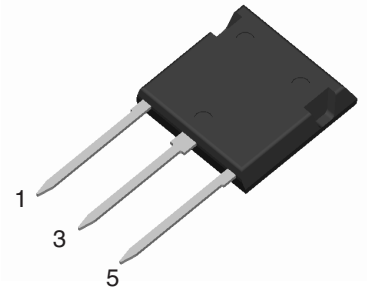
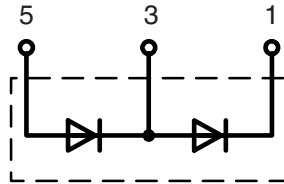
## Sonic-FRD™ series

in ISOPLUS i4-PAC™

$$V_{RRM} = 3600 \text{ V}$$

$$I_{F(AV)M} = 50 \text{ A}$$

$$t_{rr} = 350 \text{ ns}$$



Diode		
Symbol	Conditions	Maximum Ratings
$V_{RRM}^{①}$		3600 V
$V_{RRM}$		1800 V
$I_{FAV}$	$T_C = 80^\circ\text{C}$ ; sine 180°	47 A
$I_{F(AV)M}$	$T_C = 80^\circ\text{C}$ ; d = 0.5 rectangular	50 A
$I_{FSM}$	$T_{VJ} = 25^\circ\text{C}$ ; t = 10 ms; sine 50 Hz	650 A
$E_{AS}$	$I_{AS} = \text{tbd A}$ ; $L_{AS} = \text{tbd } \mu\text{H}$ ; $T_C = 25^\circ\text{C}$ ; non repetitive	tbd mJ
$P_{tot}$	$T_C = 25^\circ\text{C}$ (per diode)	280 W

### Features

- Small temperature dependence for
  - forward voltage drop
  - reverse recovery current
- Optimized for
  - dynamic avalanche ruggedness
  - low loss performance
- Exceptionally soft recovery
- Low reverse recovery current characteristic
- Soft recovery current without tail
- Optimized for high frequency hard switching
- ISOPLUS i4-PAC™ package
  - isolated back surface
  - low coupling capacity between pins and heatsink
  - enlarged creepage towards heatsink
  - enlarged creepage between pins
  - application friendly pinout
  - high reliability
  - industry standard outline

Symbol	Conditions	Characteristic Values ( $T_{VJ} = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_F$	$I_F = 60 \text{ A}$ ; $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		2.3 2.7	V V
$V_{T0}$	For power-loss calculations only			1.95 V
$r_T$	$T_{VJ} = T_{VJM}$			12 mΩ
$I_R$	$V_R = V_{RRM}$ ; $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$ ; $T_{VJ} = 125^\circ\text{C}$		1	0.2 mA mA
$I_{RM}$	$I_F = 100 \text{ A}$ ; $di_F/dt = -600 \text{ A}/\mu\text{s}$ ; $T_{VJ} = 125^\circ\text{C}$		55	A
$t_{rr}$	$V_R = 600 \text{ V}$		350	ns
$R_{thJC}$	(per diode)			0.45 K/W

### Applications

- Antiparallel diode for high frequency switching devices
- Anti saturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Induction heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

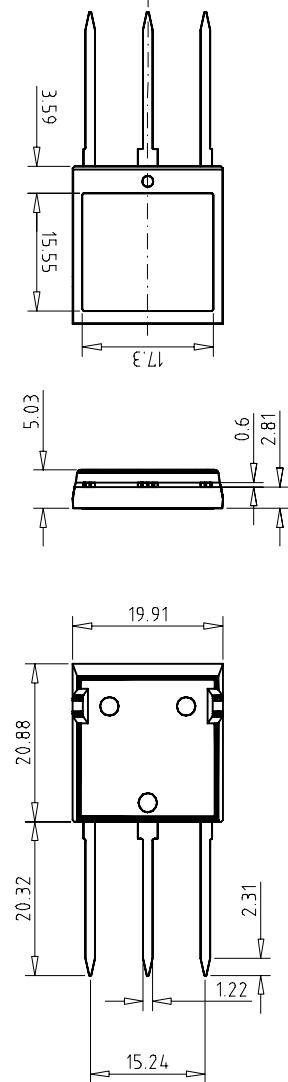
Data according to IEC 60747 and refer to a single diode unless otherwise stated.

① Diodes connected in series

**Component**

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$		-55...+150	°C
$T_{stg}$		-55...+125	°C
$V_{ISOL}$	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$	2500	V~
$F_c$	mounting force with clip	20...120	N

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$C_p$	coupling capacity between shorted pins and mounting tab in the case		40	pF
$d_s, d_A$	pin - pin	5.5		mm
$d_s, d_A$	pin - backside metal	5.5		mm
$R_{thCH}$	with heatsink compound		0.15	K/W
<b>Weight</b>			9	g

**Dimensions in mm (1 mm = 0.0394")**


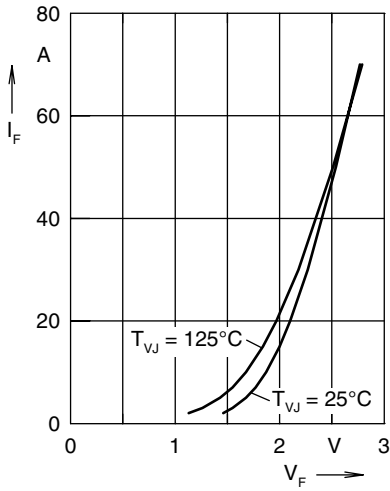


Fig. 1 Typ. forward current  $I_F$  versus  $V_F$

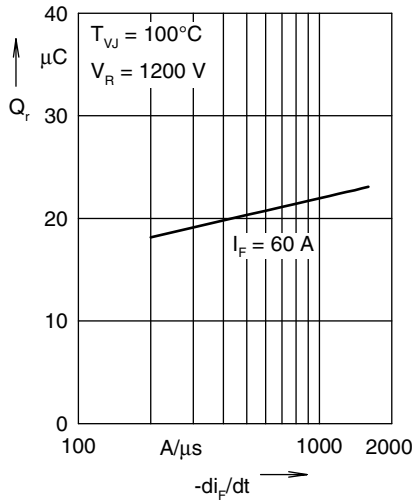


Fig. 2 Typ. reverse recovery charge  $Q_r$  versus  $-di_F/dt$

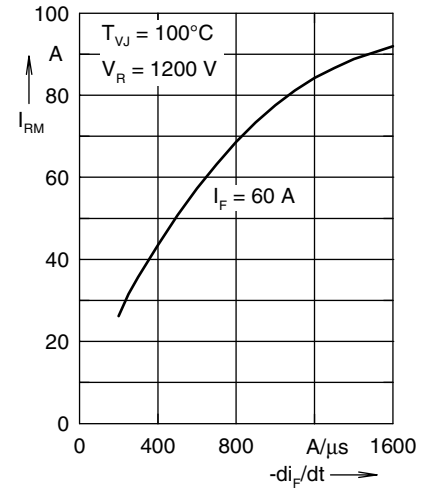


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

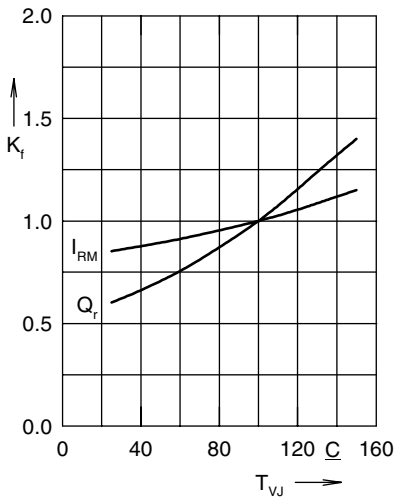


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

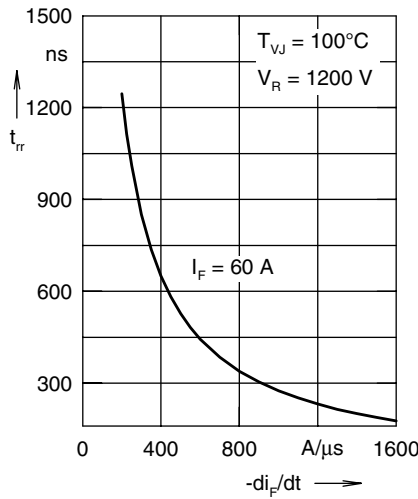


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

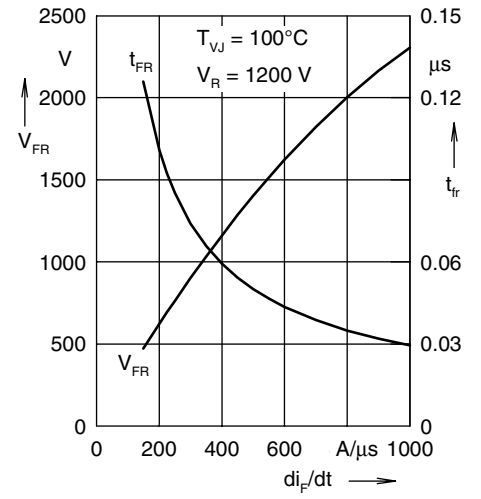


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

NOTE: Fig. 2 to Fig. 6 shows typical values