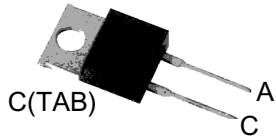


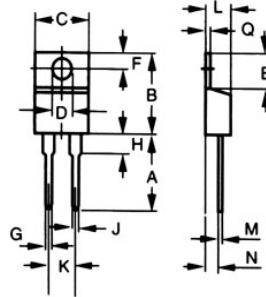
# SUR20100 thru SUR20120

## Ultra Fast Recovery Epitaxial Diodes



A=Anode, C=Cathode, TAB=Cathode

Dimensions TO-220AC



Dim.	Inches		Milimeter	
	Min.	Max.	Min.	Max.
A	0.500	0.580	12.70	14.73
B	0.560	0.650	14.23	16.51
C	0.380	0.420	9.66	10.66
D	0.139	0.161	3.54	4.08
E	2.300	0.420	5.85	6.85
F	0.100	0.135	2.54	3.42
G	0.045	0.070	1.15	1.77
H	-	0.250	-	6.35
J	0.025	0.035	0.64	0.89
K	0.190	0.210	4.83	5.33
L	0.140	0.190	3.56	4.82
M	0.015	0.022	0.38	0.56
N	0.080	0.115	2.04	2.49
Q	0.025	0.055	0.64	1.39

	$V_{RSM}$	$V_{RRM}$
	V	V
<b>SUR20100</b>	1000	1000
<b>SUR20120</b>	1200	1200

Symbol	Test Conditions	Maximum Ratings	Unit
$I_{FRMS}$	$T_{VJ}=T_{VJM}$	70	A
$I_{FAVM}$	$T_C=85^\circ\text{C}$ ; rectangular, $d=0.5$	17	
$I_{FRM}$	$t_p < 10\mu\text{s}$ ; rep. rating, pulse width limited by $T_{VJM}$	220	
$I_{FSM}$	$T_{VJ}=45^\circ\text{C}$	$t=10\text{ms}$ (50Hz), sine $t=8.3\text{ms}$ (60Hz), sine	A
	$T_{VJ}=150^\circ\text{C}$	$t=10\text{ms}$ (50Hz), sine $t=8.3\text{ms}$ (60Hz), sine	
$I^2t$	$T_{VJ}=45^\circ\text{C}$	$t=10\text{ms}$ (50Hz), sine $t=8.3\text{ms}$ (60Hz), sine	$\text{A}^2\text{s}$
	$T_{VJ}=150^\circ\text{C}$	$t=10\text{ms}$ (50Hz), sine $t=8.3\text{ms}$ (60Hz), sine	
$T_{VJ}$ $T_{VJM}$ $T_{stg}$		-40...+150 150 -40...+150	$^\circ\text{C}$
$P_{tot}$	$T_C=25^\circ\text{C}$	78	W
$M_d$	Mounting torque	0.4...0.6	Nm
Weight		2	g

# SUR20100 thru SUR20120

## Ultra Fast Recovery Epitaxial Diodes

Symbol	Test Conditions	Characteristic Values		Unit
		typ.	max.	
<b>I<sub>R</sub></b>	$T_{VJ}=25^{\circ}\text{C}; V_R=V_{RRM}$		750	$\mu\text{A}$
	$T_{VJ}=25^{\circ}\text{C}; V_R=0.8 \cdot V_{RRM}$		250	$\mu\text{A}$
	$T_{VJ}=125^{\circ}\text{C}; V_R=0.8 \cdot V_{RRM}$		7	$\text{mA}$
<b>V<sub>F</sub></b>	$I_F=12\text{A}; T_{VJ}=150^{\circ}\text{C}$		1.87	V
	$T_{VJ}=25^{\circ}\text{C}$		2.15	V
<b>V<sub>TO</sub></b>	For power-loss calculations only		1.65	V
<b>r<sub>T</sub></b>	$T_{VJ}=T_{VJM}$		18.2	$\text{m}\Omega$
<b>R<sub>thJC</sub></b> <b>R<sub>thJA</sub></b>			1.6	K/W
			60	
<b>t<sub>rr</sub></b>	$I_F=1\text{A}; -di/dt=100\text{A}/\mu\text{s}; V_R=30\text{V}; T_{VJ}=25^{\circ}\text{C}$	40	60	ns
<b>I<sub>RM</sub></b>	$V_R=540\text{V}; I_F=20\text{A}; -di_F/dt=100\text{A}/\mu\text{s}; L \leq 0.05\mu\text{H}; T_{VJ}=100^{\circ}\text{C}$	7		A

### FEATURES

- \* International standard package
- \* Glass passivated chips
- \* Very short recovery time
- \* Extremely low losses at high switching frequencies
- \* Low I<sub>RM</sub>-values
- \* Soft recovery behaviour

### 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)
- \* Inductive heating and melting
- \* Uninterruptible power supplies (UPS)
- \* Ultrasonic cleaners and welders

### ADVANTAGES

- \* High reliability circuit operation
- \* Low voltage peaks for reduced protection circuits
- \* Low noise switching
- \* Low losses
- \* Operating at lower temperature or space saving by reduced cooling

# SUR20100 thru SUR20120

## Ultra Fast Recovery Epitaxial Diodes

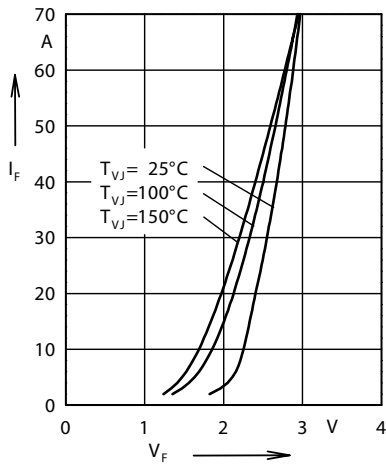


Fig. 1 Forward current versus voltage drop.

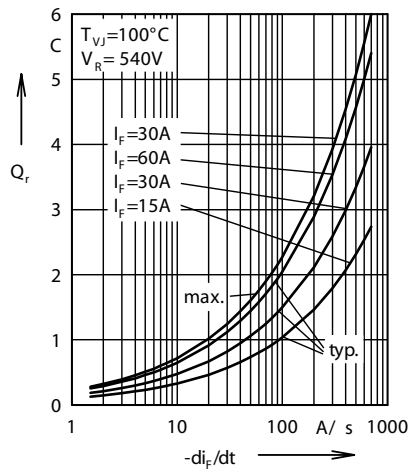


Fig. 2 Recovery charge versus  $-di_F/dt$ .

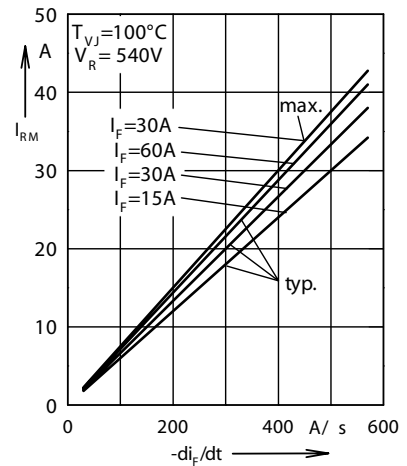


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

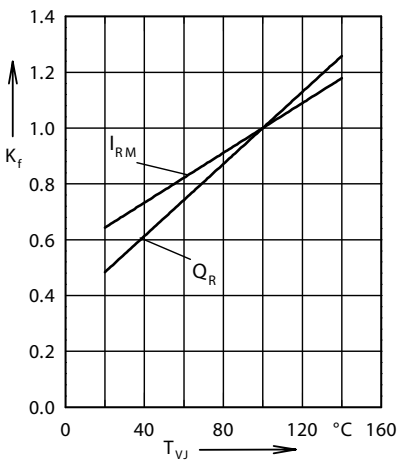


Fig. 4 Dynamic parameters versus junction temperature.

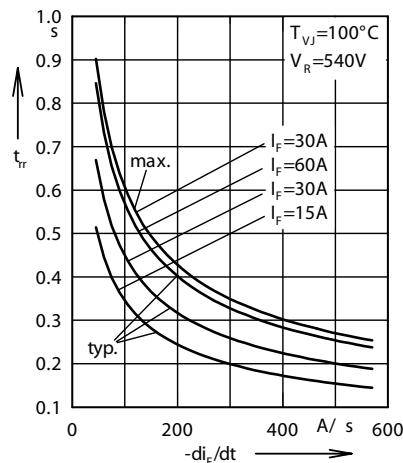


Fig. 5 Recovery time versus  $-di_F/dt$ .

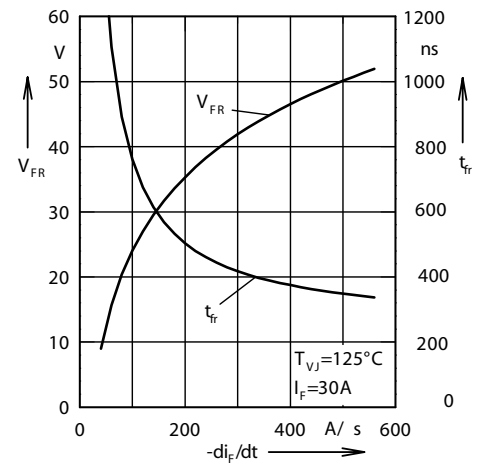


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

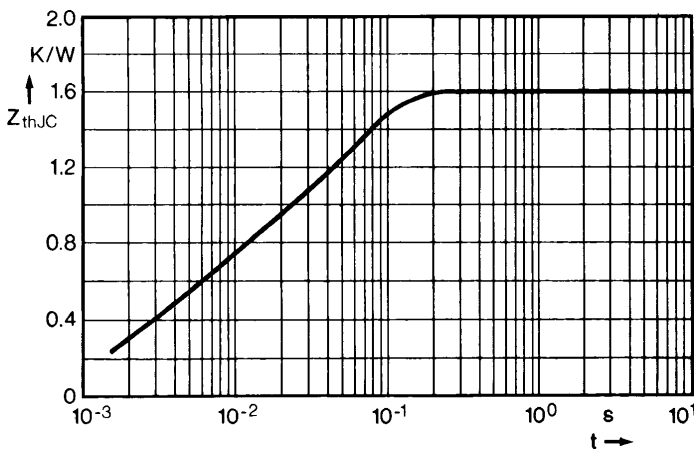


Fig. 7 Transient thermal impedance junction to case.