

1700V,10A Silicon Carbide Schottky Diode

V_R	1700V
I_F	10 A
Q_C	95 nC

Features

- Zero or negligible reverse recovery
- Low forward voltage
- Positive temperature coefficient
- Extended surge current capability
- High junction temperature
- Temperature invariant switching behavior

Applications

- Solar inverters
- Motor drivers
- Power Factor Correction
- SMPS

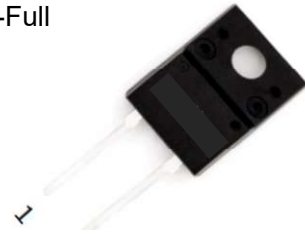
Maximum ratings

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		1700	V
$I_{F(AVG)}$	Average forward current	$T_c=145^{\circ}\text{C}$	10*	A
I_{FSM}	Non-Repetitive forward surge current	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	150	A
P_{tot}	Power dissipation	$T_c=25^{\circ}\text{C}$ $T_c=110^{\circ}\text{C}$	300* 130*	W
T_j	Operating junction temperature		-55~175	$^{\circ}\text{C}$
T_{stg}	Storage temperature		-55~175	$^{\circ}\text{C}$

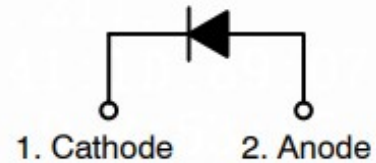
* Assumes thermal resistance of 0.5 $^{\circ}\text{C}/\text{W}$ or less

Outline

TO-220-2F-Full



Inner Circuit



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Electrical Specifications ($T_C=25^{\circ}\text{C}$, unless otherwise specified.)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	$T_j=25^{\circ}\text{C}$	1700			V
V_F	Diode forward voltage	$I_F=10\text{A } T_j=25^{\circ}\text{C}$ $I_F=10\text{A } T_j=175^{\circ}\text{C}$		1.38 1.86		V
I_R	Reverse current	$V_R=1700\text{V } T_j=25^{\circ}\text{C}$ $V_R=1700\text{V } T_j=175^{\circ}\text{C}$		1 10		μA

Dynamic Characteristics ($T_C=25^{\circ}\text{C}$, unless otherwise specified.)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=1200\text{V } T_j=25^{\circ}\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$		95		nC
C	Total capacitance	$V_R=1\text{V } f=1\text{MHz}$ $V_R=800\text{V } f=1\text{MHz}$ $V_R=1200\text{V } f=1\text{MHz}$		670 53 45		pF
E_C	Capacitance stored energy	$V_R=1200\text{V}$		36		μJ

Thermal Resistances ($T_C=25^{\circ}\text{C}$, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
$R_{th(j-c)}$	Thermal Resistance, Junction – Case			0.465	0.5	$^{\circ}\text{C/W}$
$R_{th(j-a)}$	Thermal Resistance, Junction –Ambient			31.8	60	$^{\circ}\text{C/W}$

Typical Performance

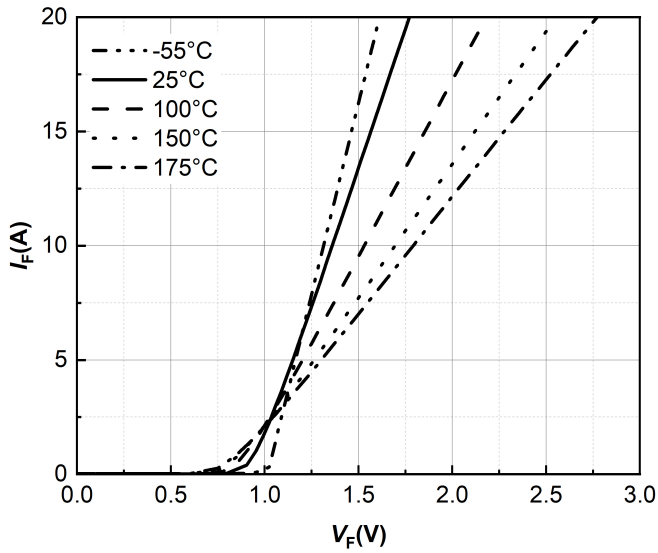


Figure 1. Typical forward characteristics

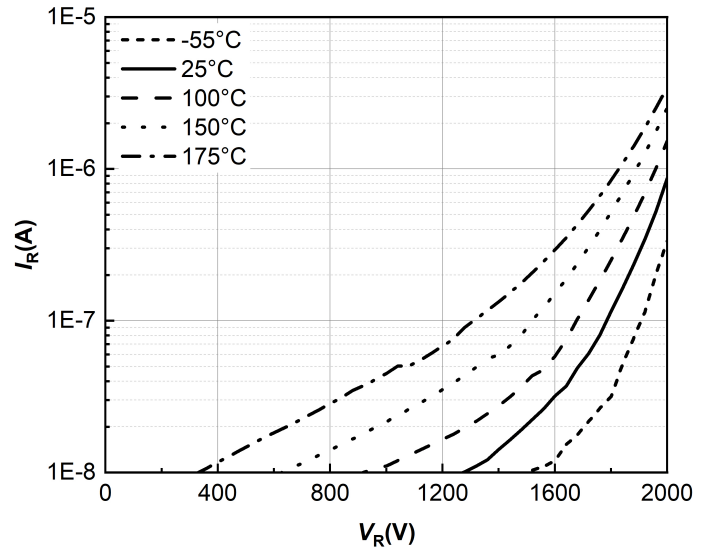


Figure 2. Typical reverse current as function of reverse voltage

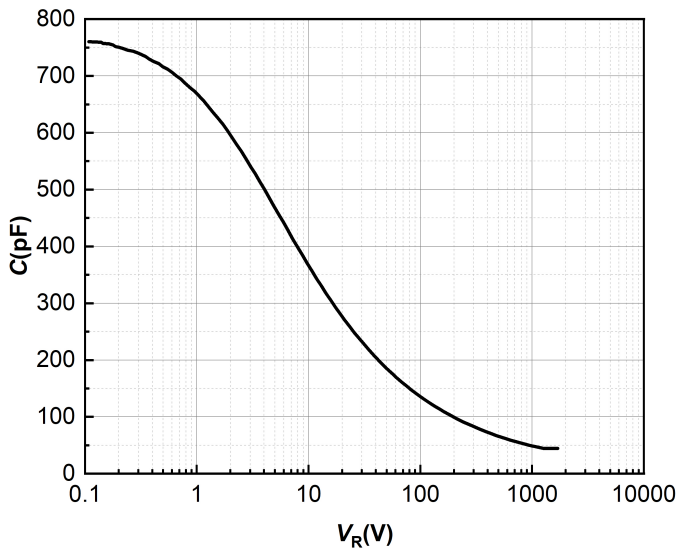


Figure 3. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_J=25^\circ\text{C}$; $f=1\text{ MHz}$

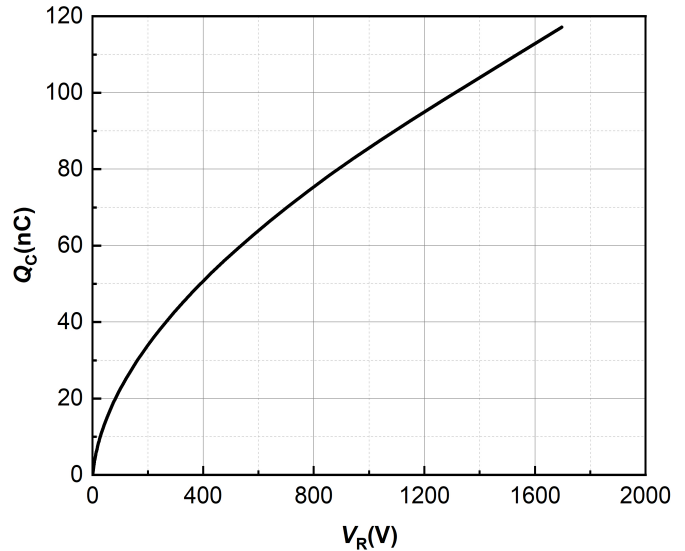


Figure 4. Typical reverse charge as function of reverse voltage

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Typical Performance

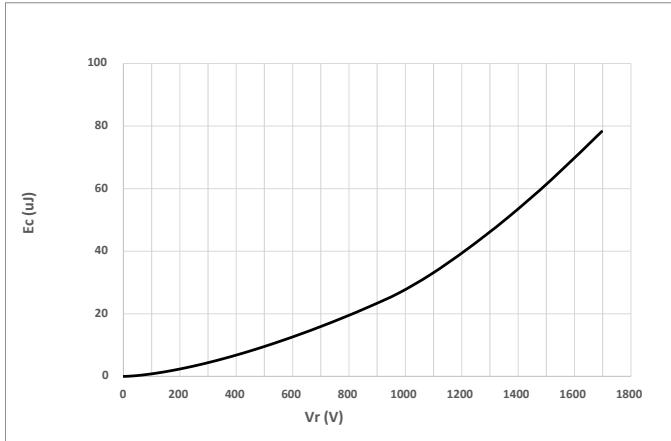


Figure 5. Capacitance Stored Energy

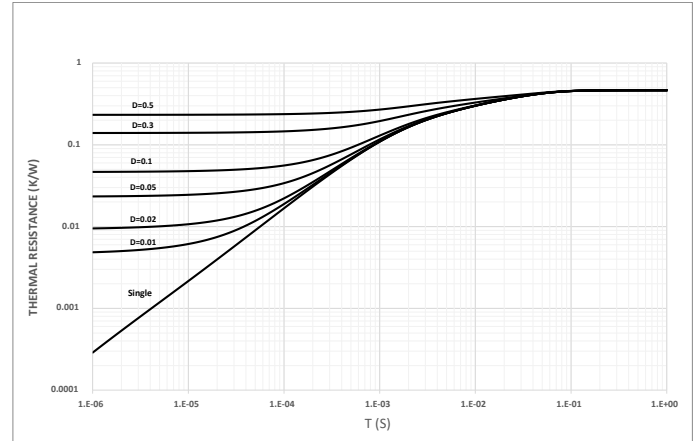


Figure 6. Transient Thermal Impedance Rthjc

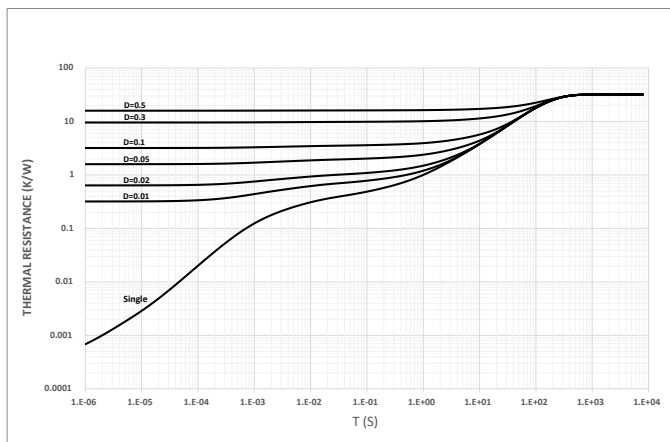


Figure 7. Transient Thermal Impedance Rthja

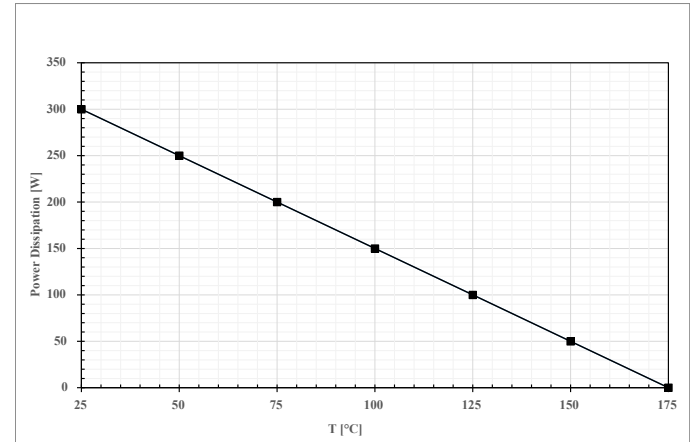
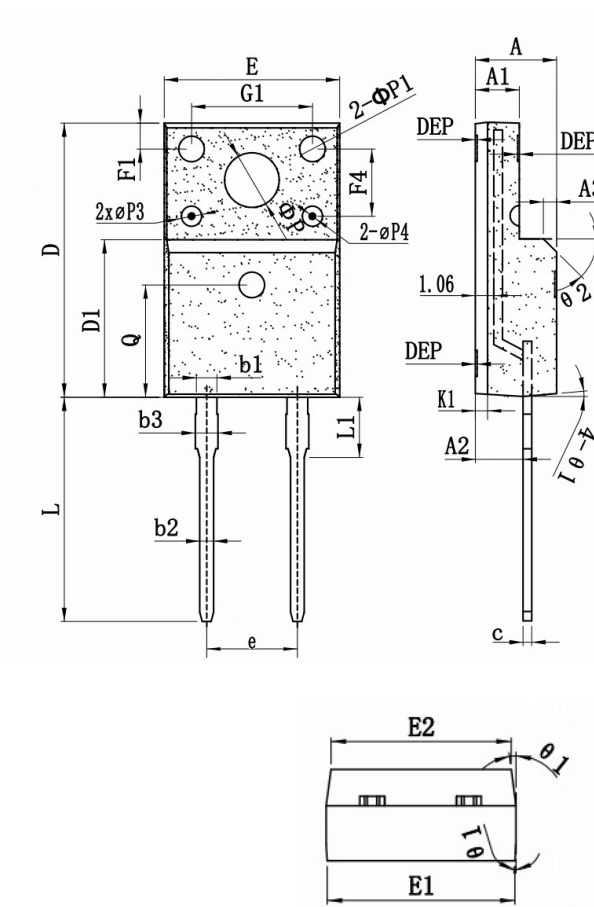


Figure 8. Power Dissipation

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Package Outline



SYMBOL	mm		
	MIN	NOM	MAX
*A	4.50	4.70	4.90
*A1	2.34	2.54	2.74
*A2	2.66	2.76	2.86
A3	1. OREF		
b1	1.18	1.20	1.24
*b2	0.75	0.80	0.85
*b3	1.22	1.30	1.38
*C	0.45	0.50	0.55
*D	15.67	15.87	16.07
D1	9.04	9.12	9.20
*e	5.03	5.08	5.13
*E	10.00	10.16	10.30
E1	9.94	10.06	10.20
E2	9.40	9.50	9.60
F1	1.40	1.50	1.60
F2	13.80	13.90	14.00
*F3	3.20	3.30	3.40
F4	3.70	3.90	4.10
G1	6.90	7.00	7.10
K1	0.65	0.70	0.75
*L	12.78	12.98	13.18
*L1	3.40	3.50	3.60
Q	6. 50REF		
*ΦP	3.08	3.18	3.28
ΦP1	1.45	1.55	1.65
ΦP2	3.30	3.40	3.50
ΦP3	0.95	1.15	1.35
ΦP4	0.25	0.30	0.35
θ1	3°	5°	7°
θ2	42°	45°	48°
*DEP	0.05	0.10	0.15