

TO-220-2L 650V SiC Schottky Diode EL-SAF00465JA



V_{RRM}	=	650	V
Q_C	=	6.4	nC
I_F	=	4	A
V_F	=	1.4	V

Features

- Low Forward Voltage (V_F)
- Shorter recovery time
- High speed switching
- High surge current capability
- Enabling higher frequency and increased power density
- System efficiency improvement
- System cost and size savings due to the reduced cooling requirements
- Pb-Free, Halogen Free, RoHS Compliant



Benefits

- Improve System Efficiency
- Reduction of Heat Sink Requirement
- Essentially No Switching Losses
- Parallel Devices Without Thermal Runaway

Applications

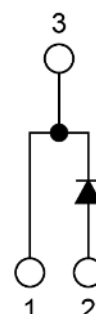
- Power Factor Correction in SMPS
- Solar inverter
- Uninterruptible Power Supply
- Motor Drives
- Data Center

Key Performance Parameters

Symbol	V_{RRM}	I_F	I_{FSM}	Q_C	$T_{J,max}$
Value	650V	4A	19A	6.4nC	175°C
Condition	$T_C@25^\circ\text{C}$		$t_p=10\text{ms}$ $T_C@25^\circ\text{C}$ Sine half wave	$V_R=400\text{V}, T_J=25^\circ\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$	-

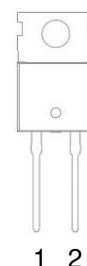
Schematic

CASE



Pin Configuration

1. Cathode
 2. Anode
- CASE: Cathode



Maximum Ratings

Parameter	Symbol	Value	Unit	Test condition
Repetitive Peak Reverse Voltage	V_{RRM}	650	V	
Surge Peak Reverse Voltage	V_{RSM}	650	V	
DC Blocking Voltage	V_R	650	V	
Continuous Forward Current	I_F^{*1}	4	A	
Surge non-repetitive forward current	I_{FSM}	19	A	$T_C = 25^{\circ}\text{C}$, $t_p = 10\text{ms}$ Sine half wave
Total power dissipation	P_D^{*1}	33	W	$T_C = 25^{\circ}\text{C}$
Junction temperature	T_J	175	$^{\circ}\text{C}$	
Storage temperature	T_{STG}	-55 / +175	$^{\circ}\text{C}$	
Mounting Torque	M_d	1 8.8	Nm lbf-in	M3 or 6-32 screw

*1 Limited by maximum T_A and for Max. R_{thJC} .

Thermal Characteristics (Measured conformable to JESD51-14.)

Parameter	Symbol	Value		Unit
		Typ	Max	
Thermal Resistance from Junction to Case	$R_{th(JC)}$	4.5	-	$^{\circ}\text{C/W}$

Electrical Characteristics

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
DC blocking voltage	V _{DC}	650	-	-	V	T _J = 25°C, I _R = 100μA
Forward voltage	V _F	-	1.4	1.75	V	I _F = 4A, T _J = 25°C
			1.8	-		I _F = 4A, T _J = 175°C
Reverse current	I _R	-	1	25	μA	V _R = 520V, T _J = 25°C
			5	-		V _R = 520V, T _J = 175°C
Total capacitance	C	-	100	-	pF	V _R = 1V, f= 1MHz,
			12			V _R = 200V, f= 1MHz
			10			V _R = 400V, f= 1MHz
Capacitance Stored Energy	E _C	-	1		μJ	V _R = 400V
Total capacitive charge	Q _C	-	6.4	-	nC	V _R = 400V, T _J = 25°C $Q_C=\int_0^{V_R} C(V)dV$

Typical Performance

V_F-I_F Characteristics

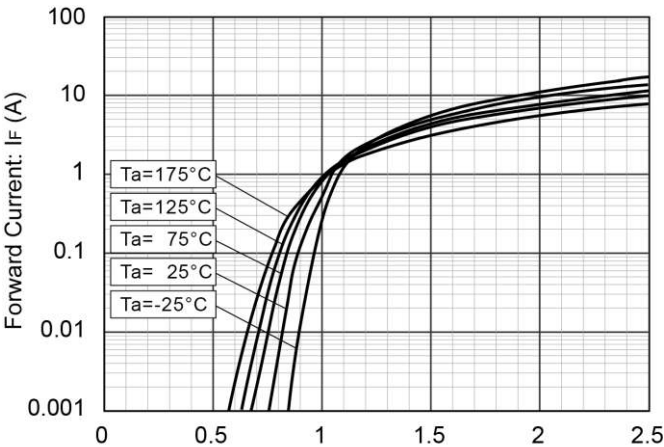


Figure1. Forward Voltage: V_F (V)

V_F-I_F Characteristics

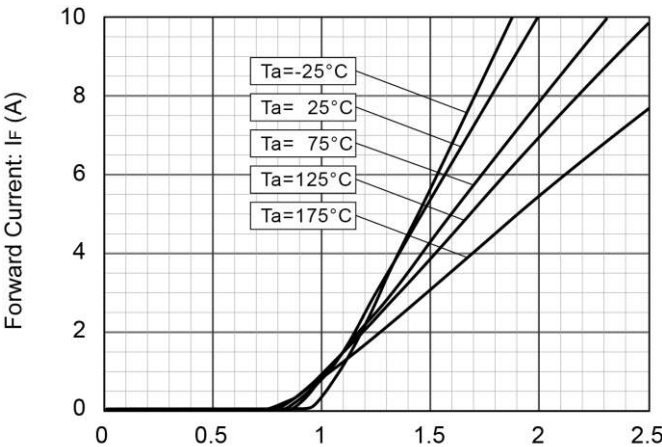


Figure2. Forward Voltage: V_F (V)

V_R-I_R Characteristics

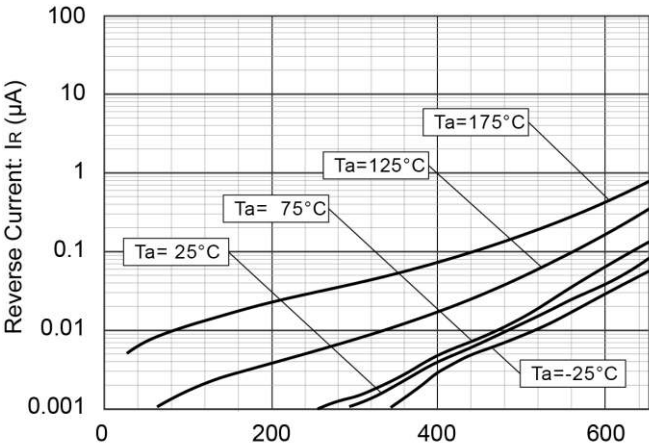


Figure3. Reverse Voltage: V_R (V)

V_R-C_t Characteristics

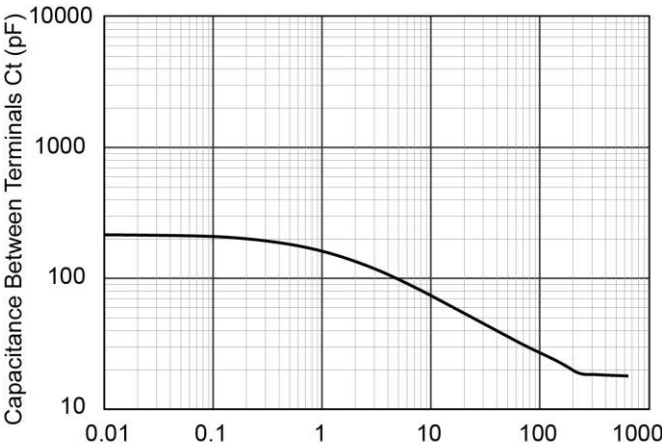


Figure4. Reverse Voltage: V_R(V) Ta = 25 °C f = 1MHz

Maximum I_p - T_c Characteristics

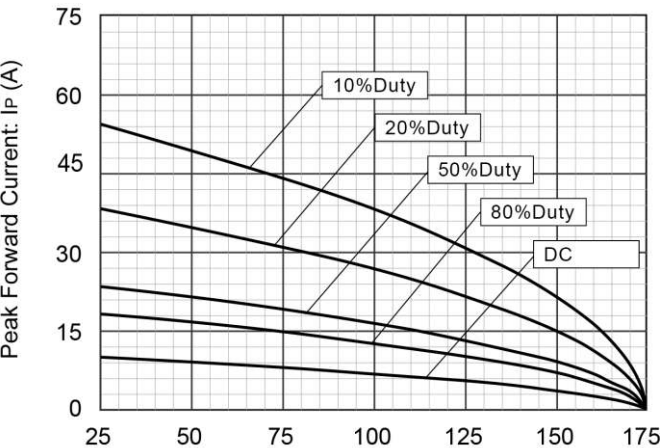


Figure5. Case Temperature: T_c (°C)

Power Dissipation

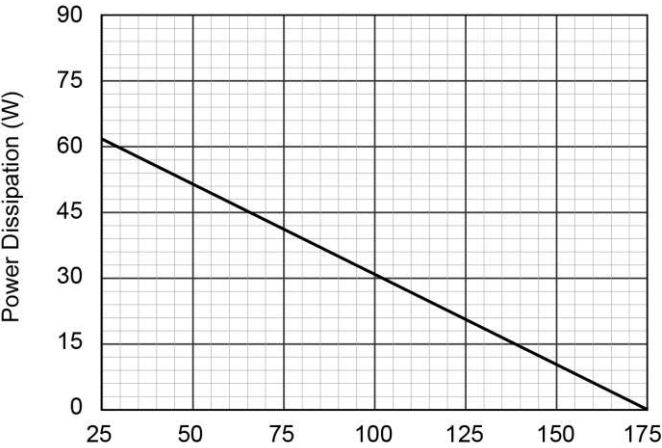
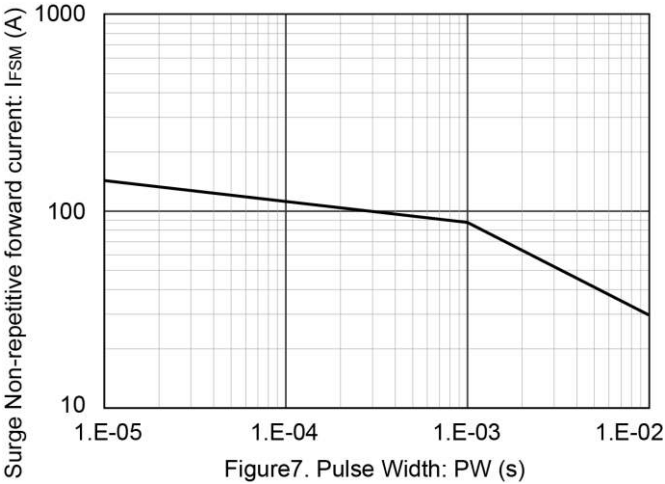
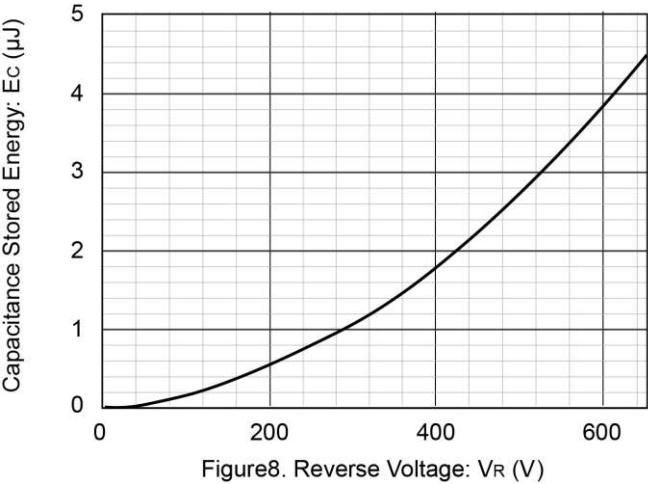


Figure6. Case Temperature: T_c (°C)

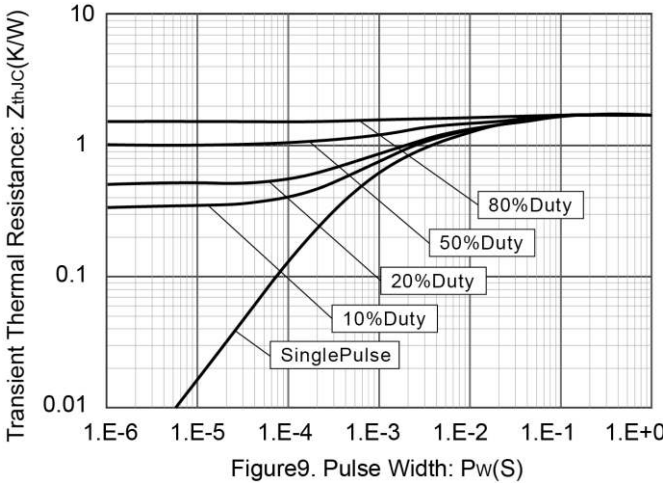
IFSM – PW Characteristics



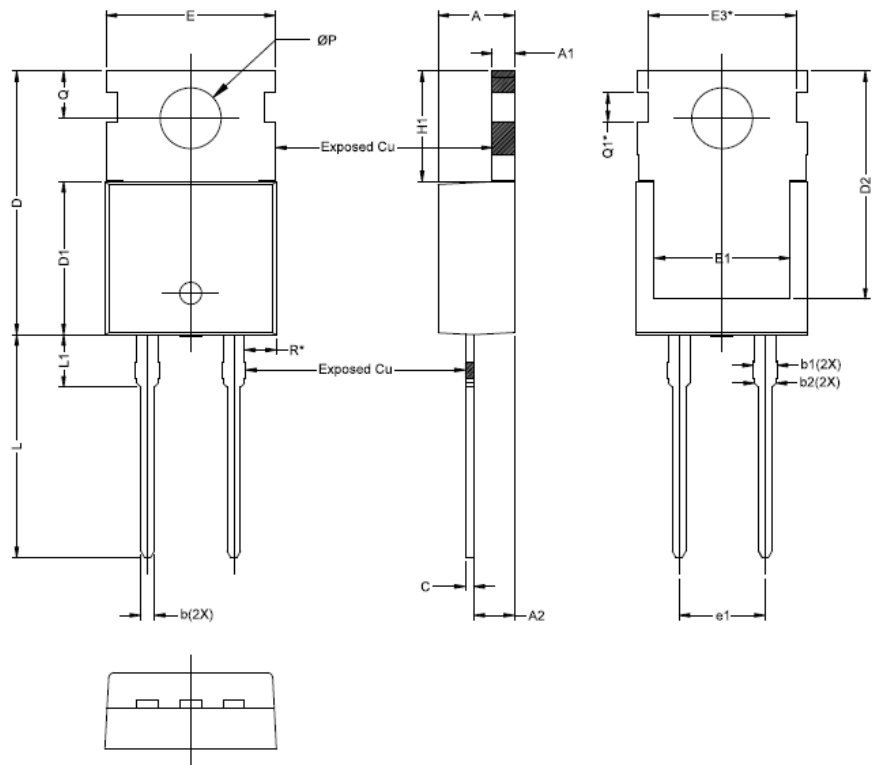
EC-V_R Characteristics



Typical Transient Thermal Resistance vs. Pulse Width



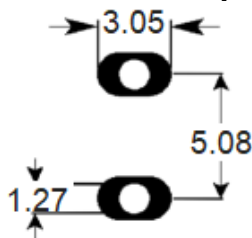
Package Outlines



DIM	MILLIMETERS		
	MIN	TYP.	MAX
A	4.3	4.5	4.7
A1	1.05	1.3	1.55
A2	2.2	2.4	2.6
b	0.7	0.8	0.9
b1	1.14	1.39	1.64
c	0.4	0.5	0.6
D	15.4	15.6	15.8
D1	8.85	9.05	9.25
D2	13.25	13.5	13.75
E	9.74	9.99	10.24
E1	7.75	8	8.25
E3	8.70 REF.		
e1	5.08 BSC.		
H1	6.35	6.55	6.75
L	12.93	13.18	13.43
L1	2.85	3.1	3.35
P	3.35	3.6	3.85
Q	2.55	2.8	3.05
Q1	1.70 REF.		

Unit : mm

Recommended pad layout for surface mount leadform



Unit : mm

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