

### TO-220-2L 650V SiC Schottky Diode EL-SAF00865JA



$V_{RRM}$	=	650	V
$Q_C$	=	12	nC
$I_F$	=	8	A
$V_F$	=	1.5	V

#### Features

- Low Forward Voltage (VF)
- 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

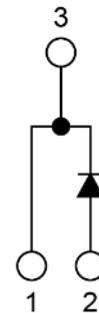
- Power Factor Correction in SMPS
- Solar inverter
- Uninterruptible Power Supply
- Motor Drives
- Data Center

#### Key Performance Parameters

Symbol	$V_{RRM}$	$I_F$	$I_{FSM}$	$Q_C$	$T_{J,max}$
Value	650V	8A	29A	12nC	175°C
Condition	$T_C@25^\circ C$		$t_p=10ms$ $T_C@25^\circ C$ Sine half wave	$V_R=400V, T_j=25^\circ C$ $Q_c = \int_0^{V_R} C(V)dV$	-

#### Schematic

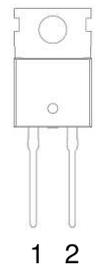
CASE



#### 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	$I_F^{*1}$	8	A	
Surge non-repetitive forward current	$I_{FSM}$	29	A	$T_C = 25^\circ\text{C}$ , $t_p = 10\text{ms}$ Sine half wave
Total power dissipation	$P_D^{*1}$	42	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	$R_{th(JC)}$	1.9	-	$^\circ\text{C/W}$

## Electrical Characteristics

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
DC blocking voltage	$V_{DC}$	650	-	-	V	$T_J = 25^\circ\text{C}$ , $I_R = 100\mu\text{A}$
Forward voltage	$V_F$	-	1.5	1.85	V	$I_F = 8\text{A}$ , $T_J = 25^\circ\text{C}$
			1.85	-		$I_F = 8\text{A}$ , $T_J = 175^\circ\text{C}$
Reverse current	$I_R$	-	2	40	$\mu\text{A}$	$V_R = 520\text{V}$ , $T_J = 25^\circ\text{C}$
			20	-		$V_R = 520\text{V}$ , $T_J = 175^\circ\text{C}$
Total capacitance	C	-	208	-	pF	$V_R = 1\text{V}$ , $f = 1\text{MHz}$ ,
			23			$V_R = 200\text{V}$ , $f = 1\text{MHz}$
			18			$V_R = 400\text{V}$ , $f = 1\text{MHz}$
Capacitance Stored Energy	$E_C$	-	1.7		$\mu\text{J}$	$V_R = 400\text{V}$
Total capacitive charge	$Q_C$	-	12	-	nC	$V_R = 400\text{V}$ , $T_J = 25^\circ\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$

# Typical Performance

## V<sub>F</sub>-I<sub>F</sub> Characteristics

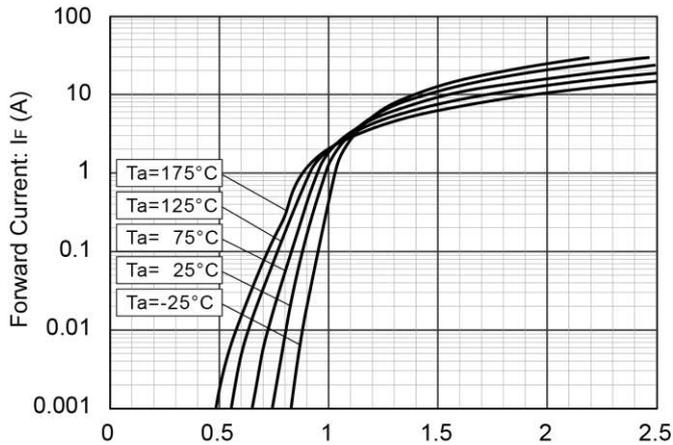


Figure1. Forward Voltage:  $V_F$  (V)

## V<sub>F</sub>-I<sub>F</sub> Characteristics

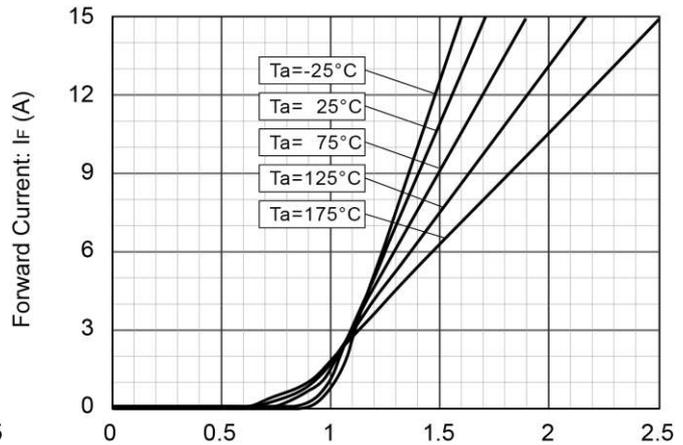


Figure2. Forward Voltage:  $V_F$  (V)

## V<sub>R</sub>-I<sub>R</sub> Characteristics

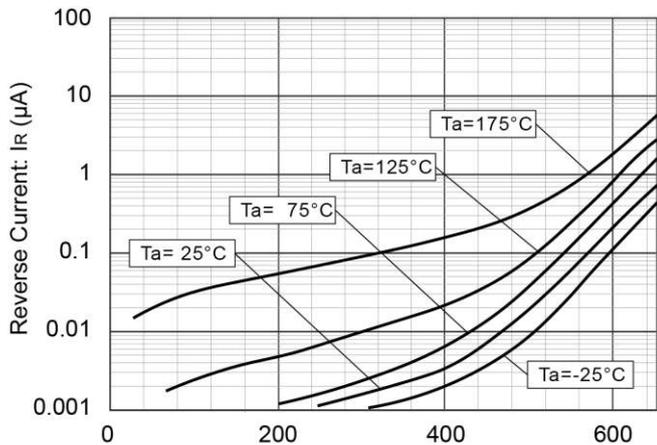


Figure3. Reverse Voltage:  $V_R$  (V)

## V<sub>R</sub>-C<sub>t</sub> Characteristics

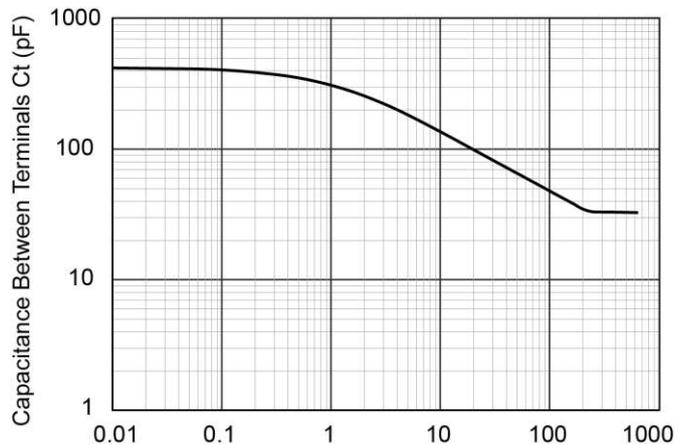


Figure4. Reverse Voltage:  $V_R$ (V)  $T_a = 25^\circ\text{C}$   $f = 1\text{MHz}$

## Maximum I<sub>p</sub> - T<sub>c</sub> Characteristics

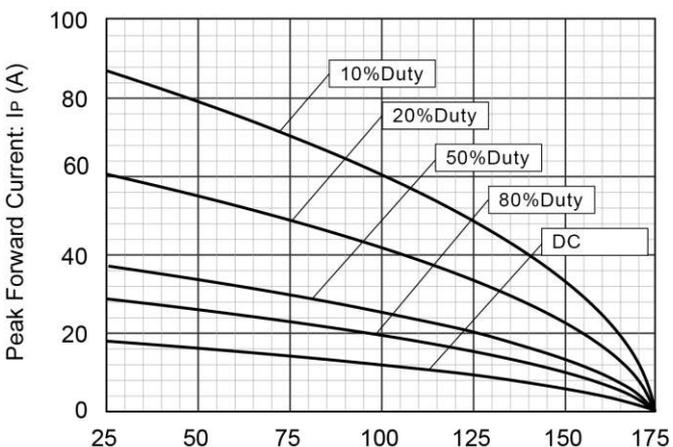


Figure5. Case Temperature:  $T_c$  ( $^\circ\text{C}$ )

## Power Dissipation

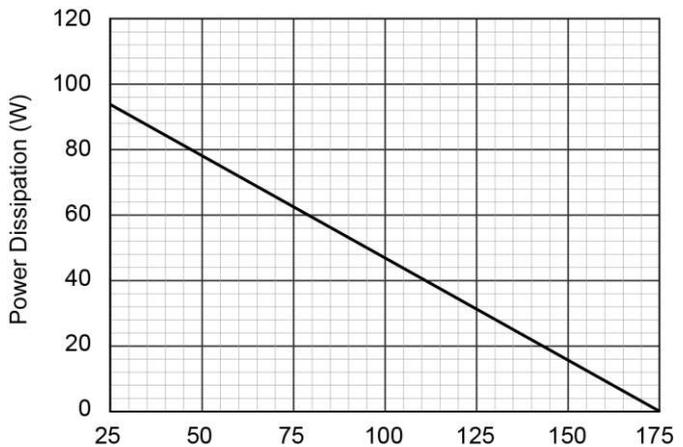
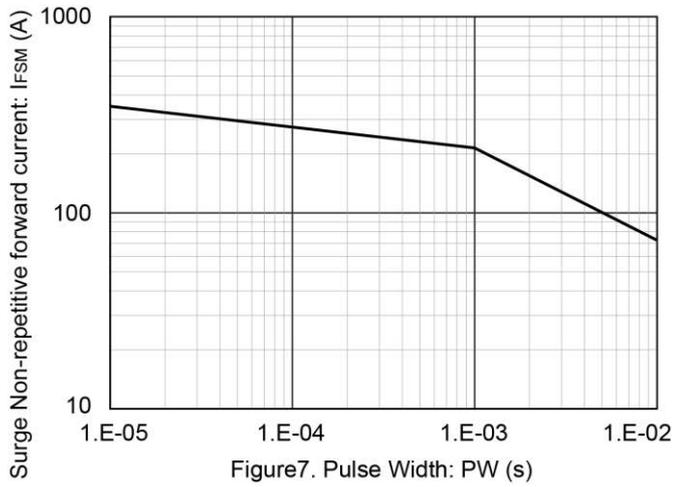
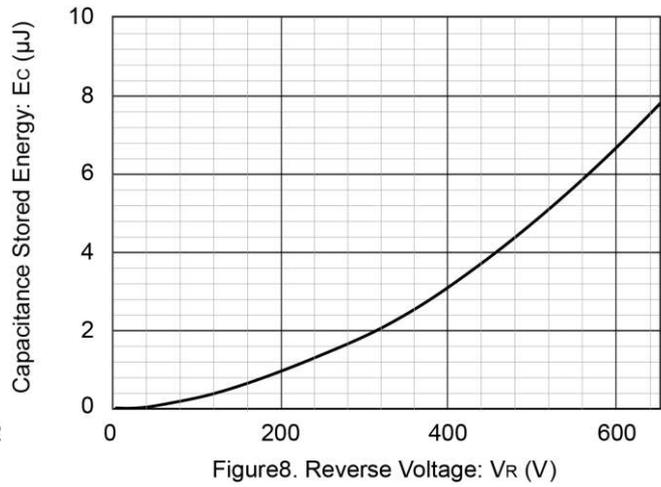


Figure6. Case Temperature:  $T_c$  ( $^\circ\text{C}$ )

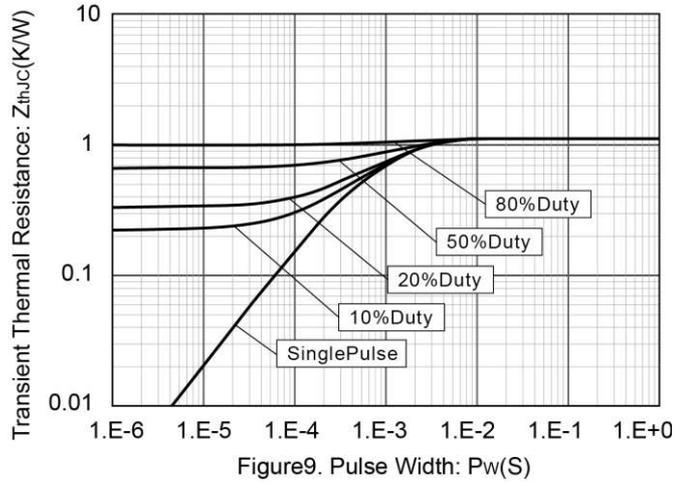
**$I_{FSM} - P_W$  Characteristics**



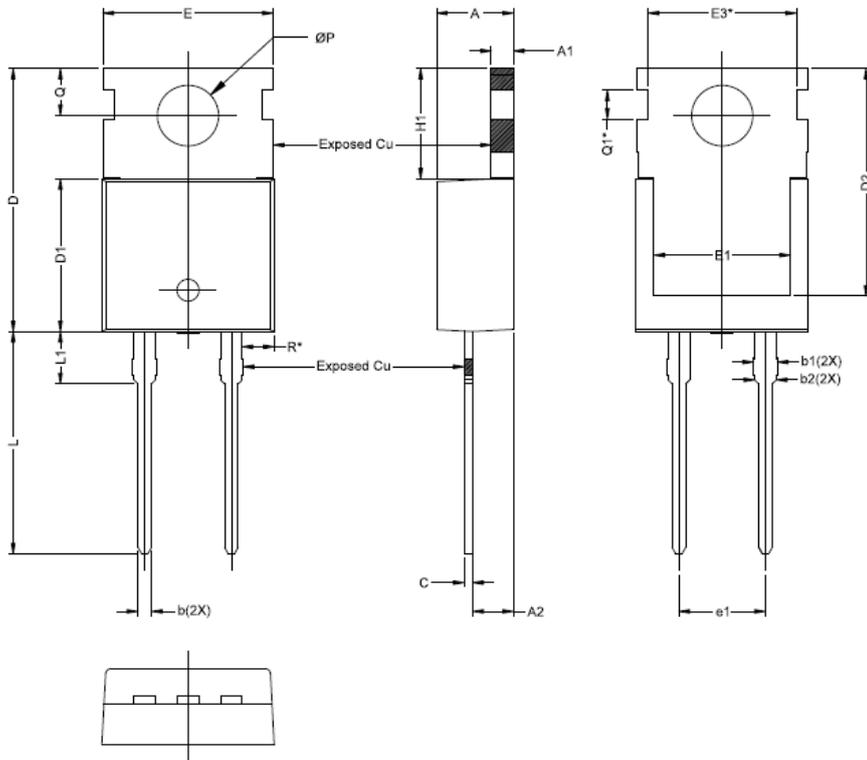
**$E_C - V_R$  Characteristics**



**Typical Transient Thermal Resistance vs. Pulse Width**



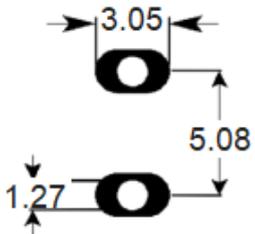
### Package Outlines



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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