DATASHEET

TO-220-2L 650V SiC Schottky Diode
EL-SAF01065JA

Preliminary

V_{RRM}	=	650	V
Q_c	=	24	nC
$I_F(T_C=135℃)$	=	10	A
V_F	=	1.35	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

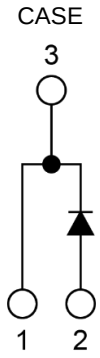
Benefits

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

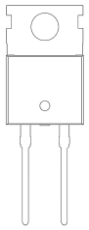
Applications

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

Schematic



Pin Configuration
1. Cathode
2. Anode
CASE: Cathode



Key Performance Parameters

Symbol	V_{RRM}	I_F	I_{FSM}	Q_C	$T_{J,max}$
Value	650V	10A	90A	24nC	175℃
Condition	T_C@25℃	T_C@135℃	t_p=10ms T_C@25℃ Sine half wave	V_R=400V, T_j=25℃ $Qc=\int_0^{V_R} C(V)dV$	-

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	10	A	T_C= 135℃
Surge non-repetitive forward current	I_{FSM}	90	A	T_C= 25℃, t_p= 10ms Sine half wave
		72		T_C= 110℃, tp= 10ms Sine half wave
Total power dissipation	P_D*1	96	W	T_C= 25℃
		42		T_C= 110℃
Junction temperature	T_J	175	℃	
Storage temperature	T_{STG}	-55 / +175	℃	
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	$R_{th(JC)}$	1.05	1.55	℃/W

Electrical Characteristics

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
DC blocking voltage	V_{DC}	650	-	-	V	T_J= 25℃, I_R= 50μA
Forward voltage	V_F	-	1.35	1.50	V	I_F= 10A, T_J= 25℃
			1.60	-		I_F= 10A, T_J= 150℃
			1.70	-		I_F= 10A, T_J= 175℃
Reverse current	I_R	-	2	50	μA	V_R= 650V, T_J= 25℃
			8	-		V_R= 650V, T_J= 150℃
			15	-		V_R= 650V, T_J= 175℃
Total capacitance	C	-	410	-	pF	V_R= 1V, f= 1MHz, T_J= 25℃
			40			V_R= 400V, f= 1MHz, T_J= 25℃
			39			V_R= 650V, f= 1MHz, T_J= 25℃
Capacitance Stored Energy	E_C	-	4.0		μJ	V_R = 400V
Total capacitive charge	Q_C	-	24	-	nC	V_R= 400V, T_J= 25℃ $Qc=\int_0^{V_R} C(V)dV$

Typical Performance

V_F-I_F Characteristics

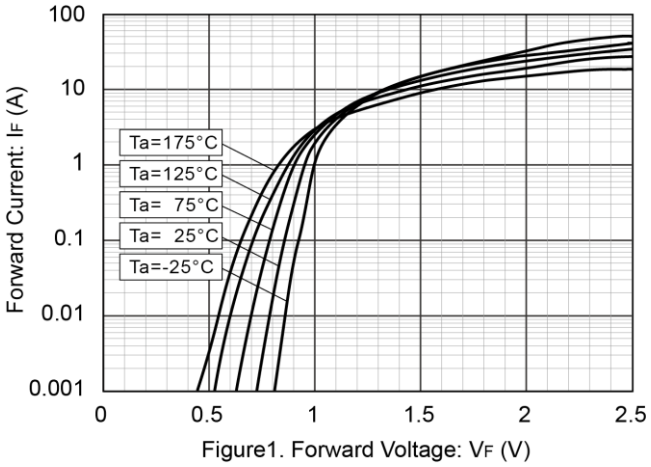


Figure1. Forward Voltage: V_F (V)

V_F-I_F Characteristics

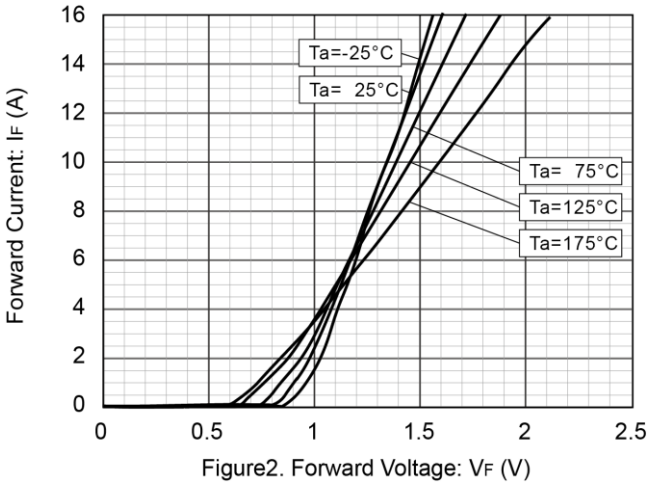


Figure2. Forward Voltage: V_F (V)

V_R-I_R Characteristics

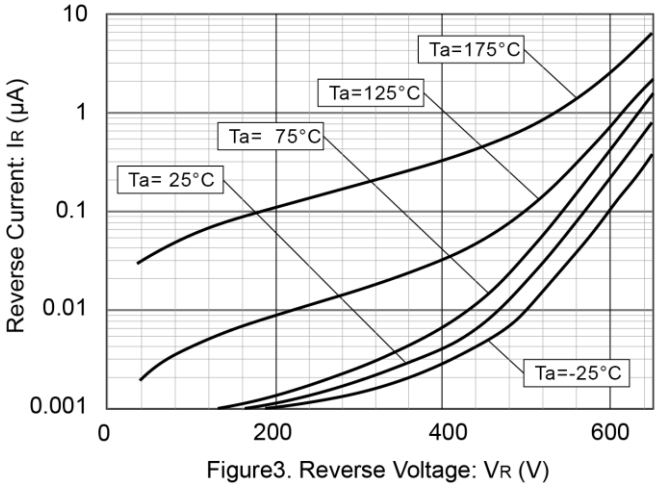


Figure3. Reverse Voltage: V_R (V)

V_R-C_t Characteristics

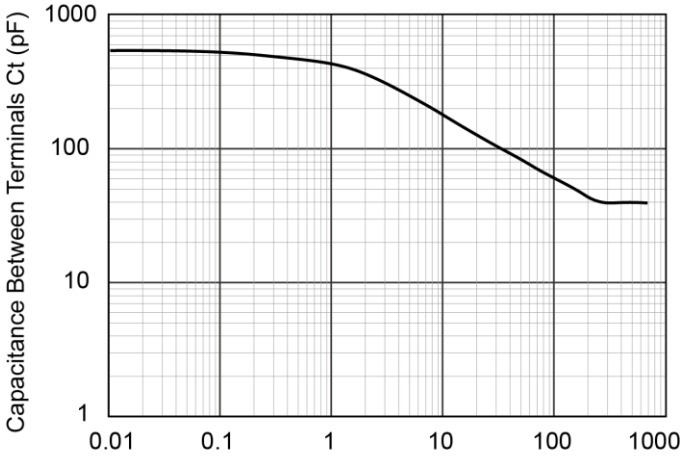


Figure4. Reverse Voltage: V_R(V) Ta = 25 °C f = 1MHz

Maximum I_p – T_C Characteristics

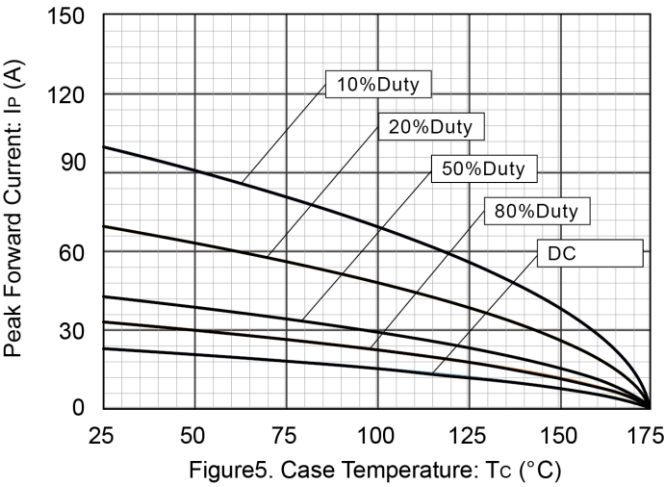


Figure5. Case Temperature: T_C (°C)

Power Dissipation

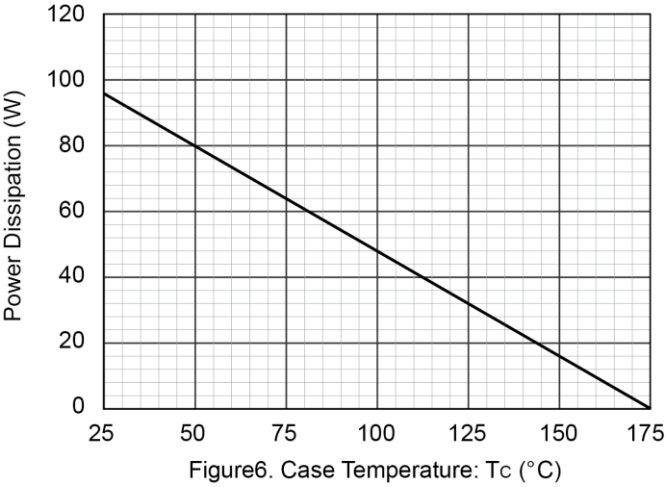


Figure6. Case Temperature: T_C (°C)

I_{FSM} – P_W Characteristics

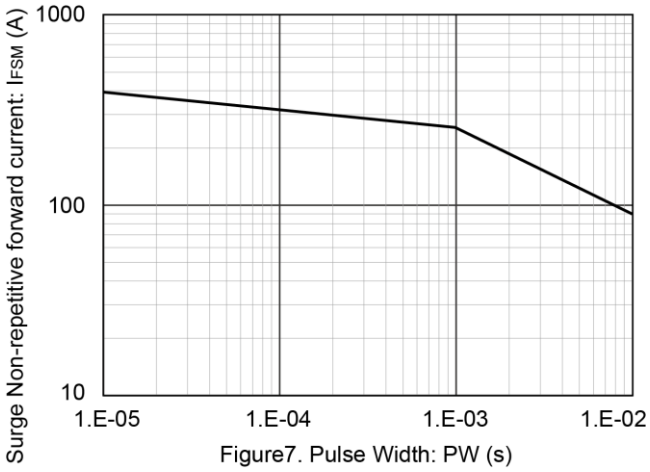


Figure7. Pulse Width: PW (s)

E_C-V_R Characteristics

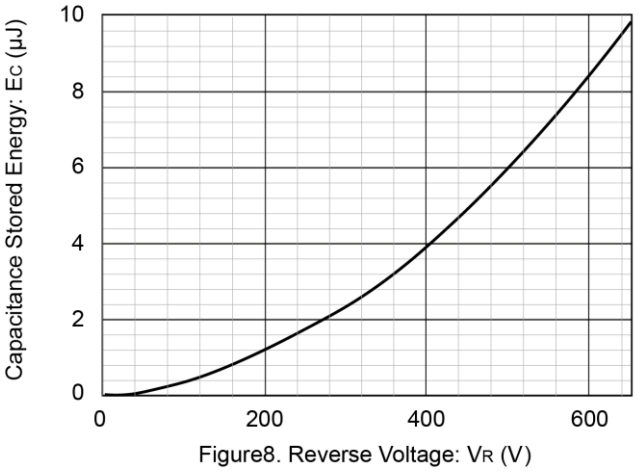


Figure8. Reverse Voltage: VR (V)

Typical Transient Thermal Resistance vs. Pulse Width

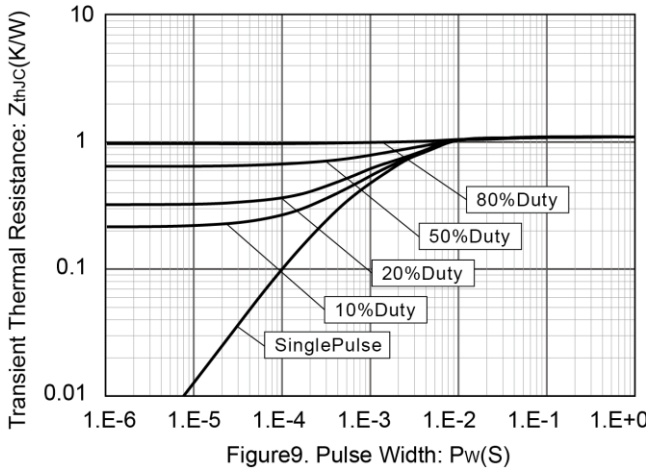
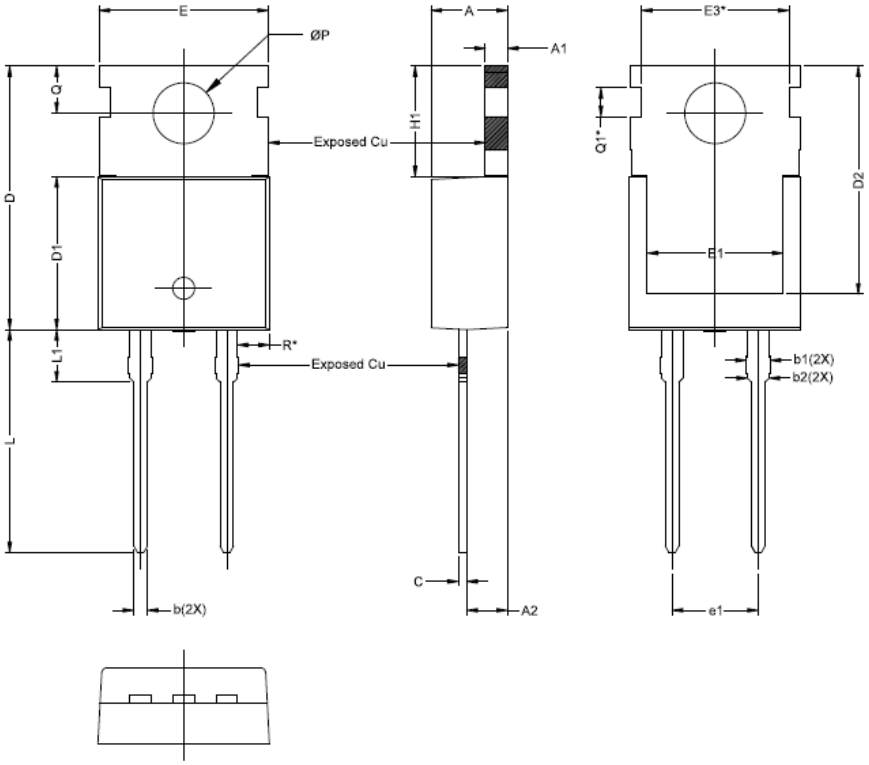


Figure9. Pulse Width: PW(S)

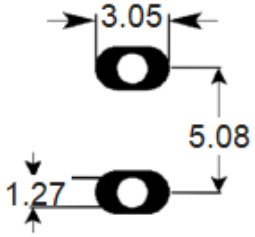
Package Outlines



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	8.70REF.		
e1	5.08BSC.		
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	1.70REF.		

Unit : mm

Recommended pad layout for surface mount leadform



Unit : mm

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