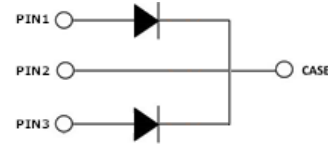




# High Power SiC Schottky Barrier Diode ASA040V120E5



Package Type: TO-247-3L



## Applications:

- Industrial power supplies:  
Industrial UPS
- Battery chargers
- Solar inverters
- Switch mode power supplies

## Features:

- Revolutionary semiconductor material - Silicon Carbide (SiC)
- No reverse recovery
- High-speed switching performance
- System cost / size saving due to reduced cooling requirement
- Junction Temp range -55°C to 175°C

### Absolute Maximum Ratings ( $T_{amb}=25^{\circ}\text{C}$ , unless specified otherwise)

Symbol	Parameter		ASA040V120E5	Unit
$V_{DC}$	DC reverse voltage		1200	V
$V_{RRM}$	Repetitive peak reverse voltage			
$V_{RSM}$	Surge peak reverse voltage			
$I_F$	Continuous Forward Current	$T_C = 25^{\circ}\text{C}$	53*/106**	A
		$T_C = 135^{\circ}\text{C}$	27*/54**	
		$T_C = 153^{\circ}\text{C}$	20*/40**	
$I_{FSM}$	Surge non-repetitive forward current	$T_C = 25^{\circ}\text{C}$ , $t_p = 10\text{ms}$ , half sine pulse	206*	
		$T_C = 150^{\circ}\text{C}$ , $t_p = 10\text{ms}$ , half sine pulse	187*	
$I_{F,Max}$	Non-repetitive peak forward current	$T_C = 25^{\circ}\text{C}$ , $t_p = 10\mu\text{s}$ , pulse	1190*	
$I_{FRM}$	Surge repetitive forward current	$T_C = 25^{\circ}\text{C}$ , $t_p = 10\text{ms}$ , half sine wave $D = 0.1$	141*	
$P_{tot}$	Total Power Dissipation		278*	W
$\int i^2 dt$	$i^2t$ value		212*	$\text{A}^2\text{s}$
$T_j$	Operating junction temperature range		-55 to 175	$^{\circ}\text{C}$
$T_{stg}$	Storage temperature range		-55 to 175	
$M$	Mounting torque	M3 screw	1	Nm

Note: \* per leg, \*\* per device

**Static Electrical Characteristics ( $T_A = 25^\circ\text{C}$ , unless specified otherwise)**

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{DC}$	DC blocking voltage	$I_R = 100 \mu\text{A}$	1200	-	-	V
$V_F$	Forward voltage	$I_F = 20\text{A}, T_j = 25^\circ\text{C}$	-	1.40	1.60	V
		$I_F = 20\text{A}, T_j = 175^\circ\text{C}$	-	2.00	2.40	
$I_R$	Reverse current	$V_R = 1200\text{V}, T_j = 25^\circ\text{C}$	-	5	80	$\mu\text{A}$
		$V_R = 1200\text{V}, T_j = 175^\circ\text{C}$	-	30	320	

**Thermal Characteristics**

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction-to-case Thermal Resistance		-	0.54*/0.27**	-	$^\circ\text{C}/\text{W}$

Note: \* per leg, \*\* per device

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

$C$	Total capacitance	$V_R = 0\text{V}, f = 1\text{MHz}$	-	1373	-	$\text{pF}$
		$V_R = 400\text{V}, f = 1\text{MHz}$	-	86	-	
		$V_R = 800\text{V}, f = 1\text{MHz}$	-	63	-	
$Q_C$	Total capacitive charge	$V_R = 800\text{V}$	-	70	-	nC
$E_C$	Capacitance stored energy	$V_R = 800\text{V}$	-	20	-	$\mu\text{J}$

### Electrical Characteristic Diagrams

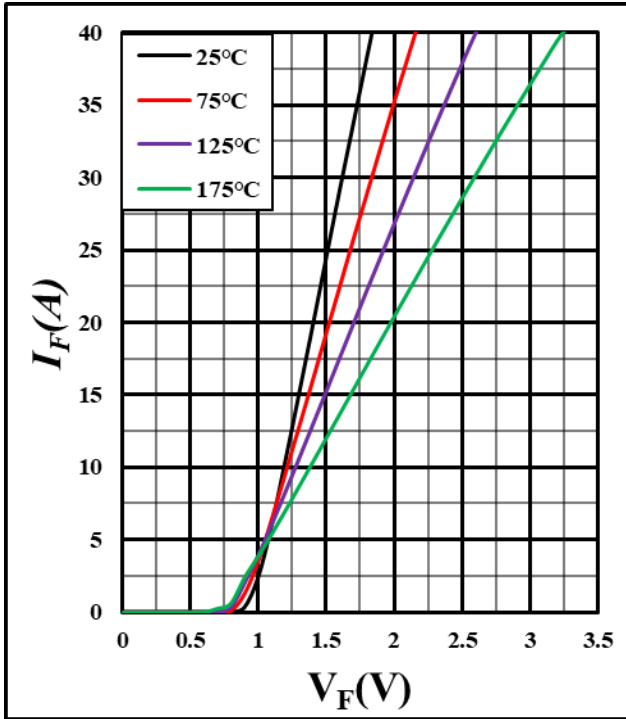


Figure 1. Forward characteristics

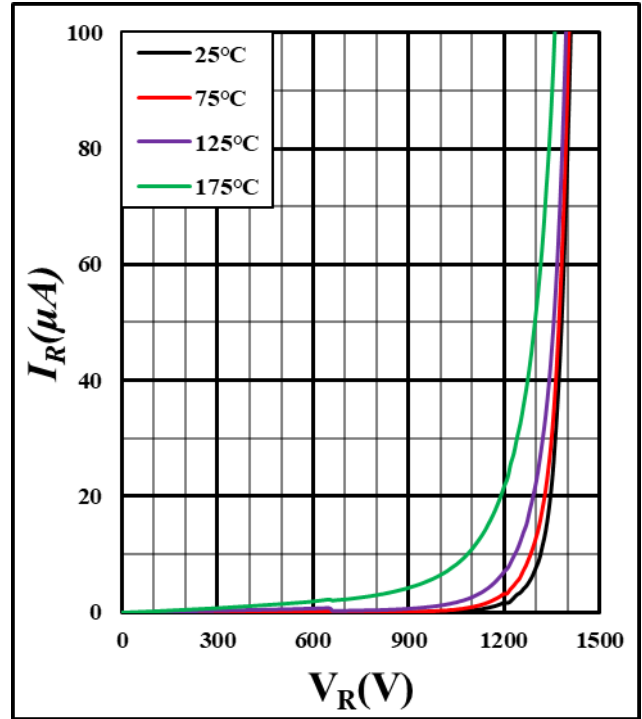


Figure 2. Reverse characteristics

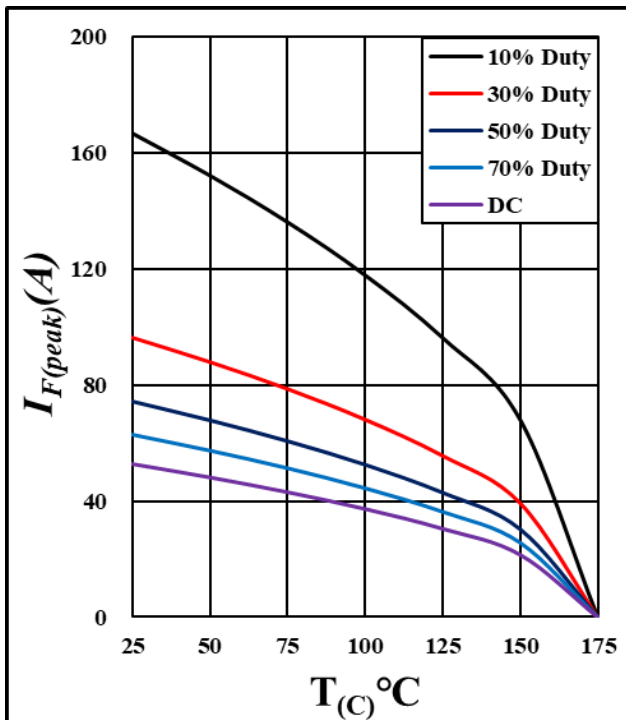


Figure 3. Current derating

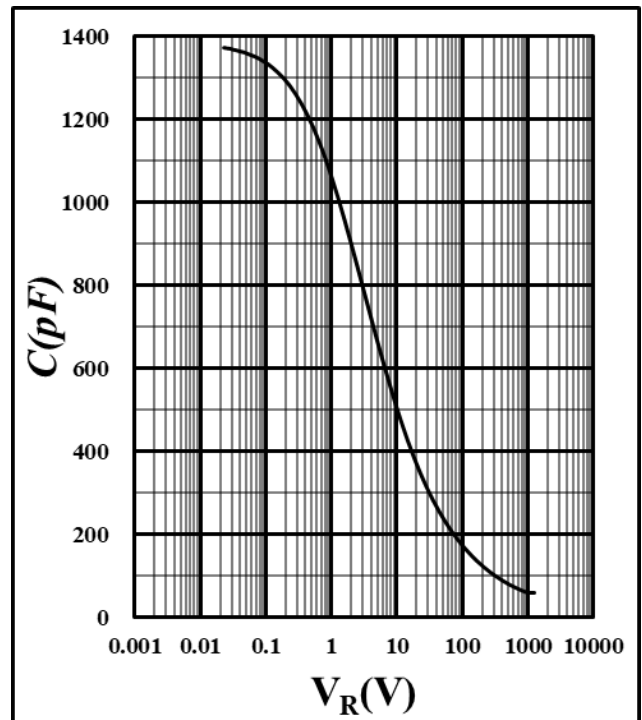


Figure 4. Capacitance vs. reverse voltage

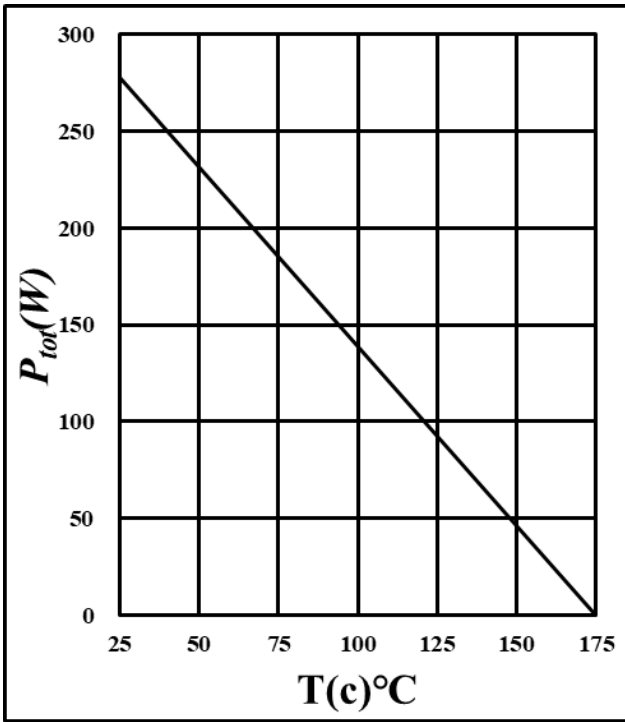


Figure 5. Power derating

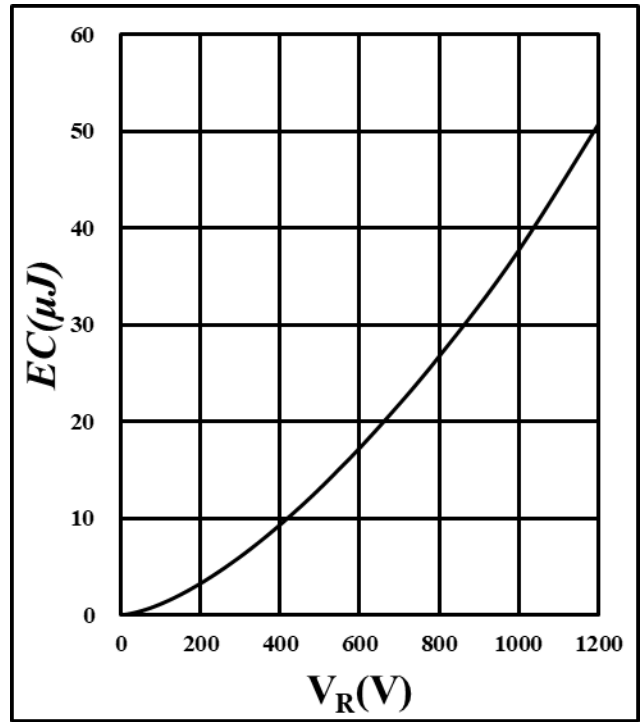


Figure 6. Capacitance stored energy

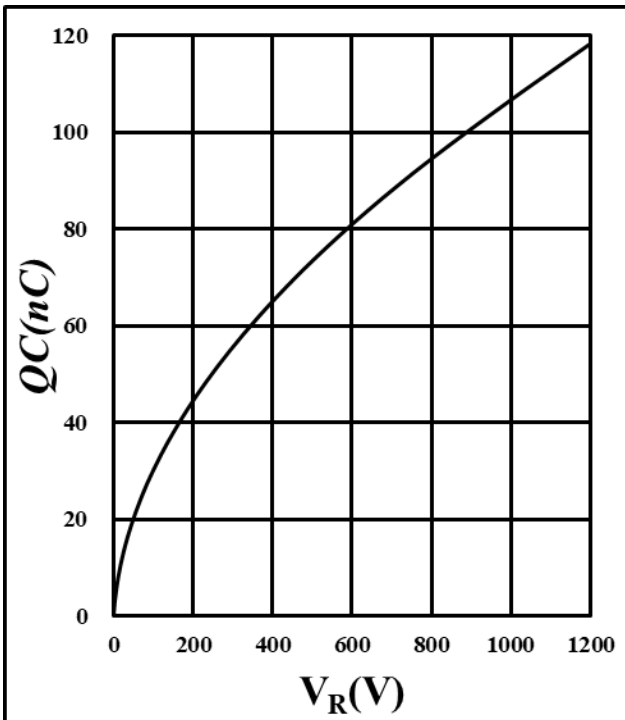


Figure 7. Total capacitance charge vs. reverse voltage

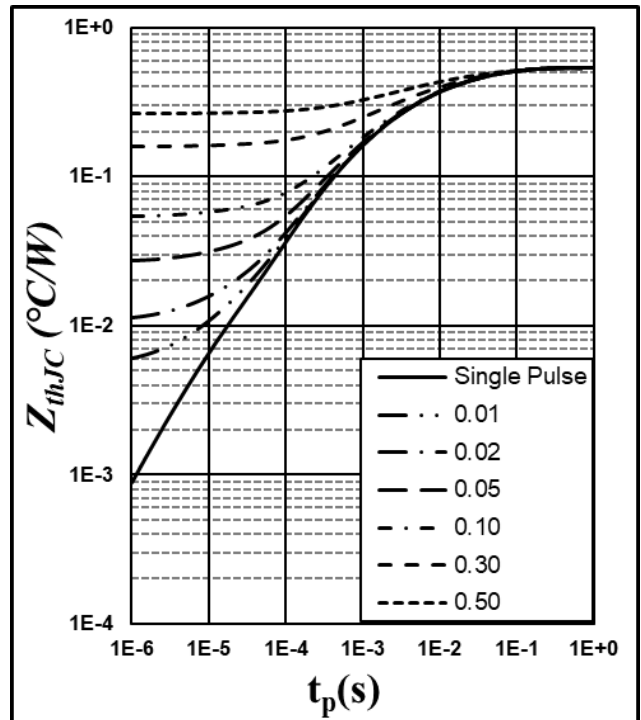
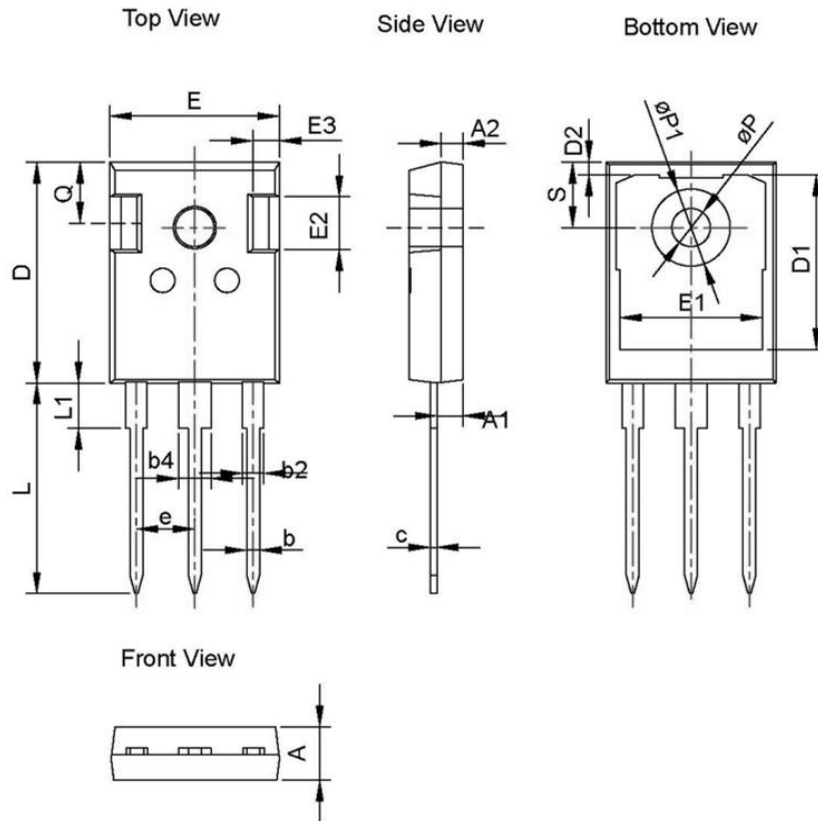


Figure 8. Transient Thermal Impedance  
(Junction - Case)

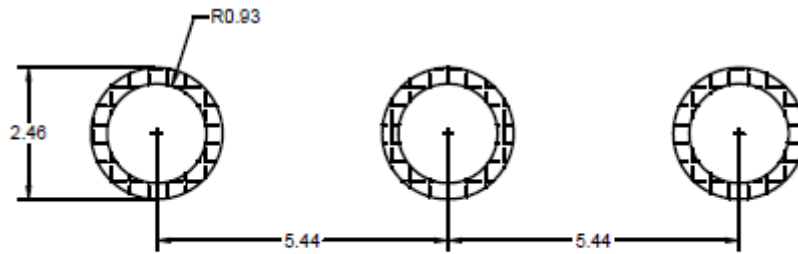
### Package Information



Dimension unit: [mm]			
Symbol	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.60	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
D2	1.00	1.20	1.35
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44 BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
øP	3.40	3.60	3.80
øP1	-	-	7.30
Q	5.40	5.80	6.20
S	6.20 BSC		

## Recommended Solder Pad Layout

Note: All dimensions are in mm



TO-247-3L

## Ordering Information

Part number	ASA040V120E5
Package	TO-247-3L
Unit quantity	300 EA
Packing type	Tube