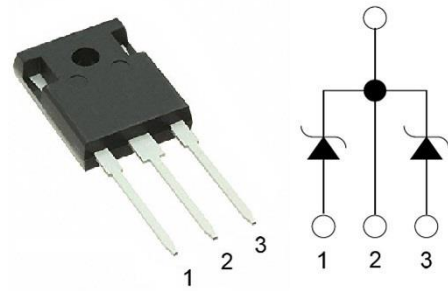


## Product Summary

$V_R = 650\text{ V}$   
 $I_F = 40\text{ A (}T_C=135^\circ\text{C)}^{**}$   
 $Q_C = 84\text{ nC (}V_R=400\text{V)}^{**}$



TO-247-3

## Features

- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on  $V_F$
- Temperature Independent Switching Behavior
- 100% avalanche tested

## Benefits

- Higher System Efficiency
- Parallel Device Convenience without thermal runaway
- Higher Temperature Application
- No Switching loss
- Hard Switching & Higher Reliability
- Environmental Protection

## Applications

- Servo Drives
- Solar Inverters
- Onboard EV chargers
- AC/DC converters
- DC/DC converters
- Uninterruptable power supplies

## Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Value	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$		650	V
Peak Reverse Surge Voltage	$V_{RSM}$		650	V
DC Blocking Voltage	$V_R$		650	V
Continuous Forward Current (per leg / per device)	$I_F$	$T_C=25^\circ\text{C}$ $T_C=135^\circ\text{C}$ $T_C=150^\circ\text{C}$	43/86 20/40 15/30	A
Non repetitive Forward Surge Current *	$I_{FSM}$	$T_C = 25^\circ\text{C}, t_p=10\text{ ms,}$ Half Sine Pulse $T_C = 110^\circ\text{C}, t_p=10\text{ ms,}$ Half Sine Pulse	110 100	A
Repetitive peak Forward Surge Current *	$I_{FRM}$	$T_C = 25^\circ\text{C}, t_p=10\text{ ms,}$ Freq = 0.1Hz, 100 cycles, Half Sine Pulse $T_C = 110^\circ\text{C}, t_p=10\text{ ms,}$ Freq = 0.1Hz, 100 cycles, Half Sine Pulse	100 90	A
Total power dissipation*	$P_D$	$T_C=25^\circ\text{C}$	150	W
Operating Junction Temperature	$T_J$		-55 to 175	$^\circ\text{C}$
Storage Temperature	$T_{STG}$		-55 to 175	$^\circ\text{C}$

Note : \* Per leg \*\* Per device

## Electrical Characteristics

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
DC Blocking Voltage *	$V_{DC}$	$T_J = 25^{\circ}C$	650			V
Forward Voltage *	$V_F$	$I_F = 20A, T_J = 25^{\circ}C$		1.45	1.75	V
		$I_F = 20A, T_J = 125^{\circ}C$		1.63		
		$I_F = 20A, T_J = 175^{\circ}C$		1.79		
Reverse Current *	$I_R$	$V_R = 650V, T_J = 25^{\circ}C$		1.2	70	$\mu A$
		$V_R = 650V, T_J = 125^{\circ}C$		6		
		$V_R = 650V, T_J = 175^{\circ}C$		18		
Total Capacitive Charge *	$Q_C$	$V_R = 400V, T_J = 25^{\circ}C$		42		nC
Total Capacitance *	C	$V_R = 1V, T_J = 25^{\circ}C,$ Freq = 1MHz		701		pF
		$V_R = 200V, T_J = 25^{\circ}C,$ Freq = 1MHz		81		
		$V_R = 400V, T_J = 25^{\circ}C,$ Freq = 1MHz		64		

Note: This is a majority carrier diode, so there is no reverse recovery charge

## Thermal Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Thermal Resistance	$R_{th(j-c)}$	junction-case		1.0* 0.5**		$^{\circ}C/W$

Note : \* Per leg \*\* Per device

## Typical Electrical Curves (Per Leg)

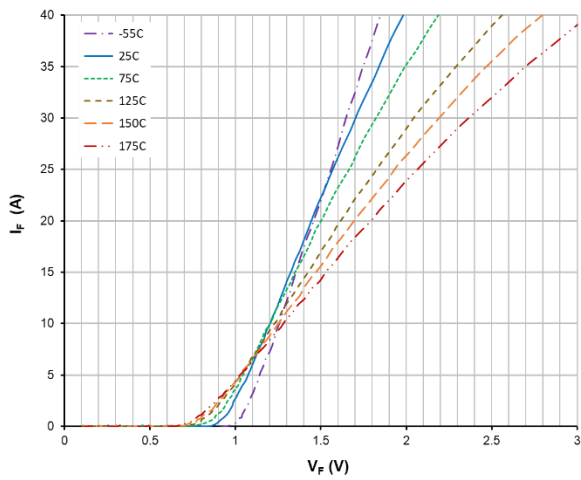


Figure 1. Forward Characteristics

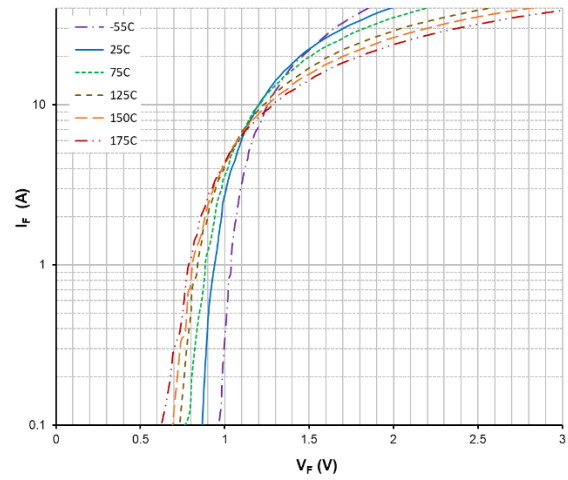


Figure 2. Forward Characteristics

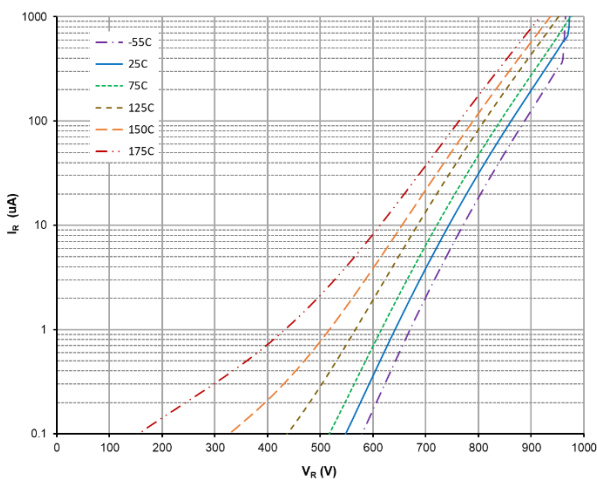


Figure 3. Reverse Characteristics

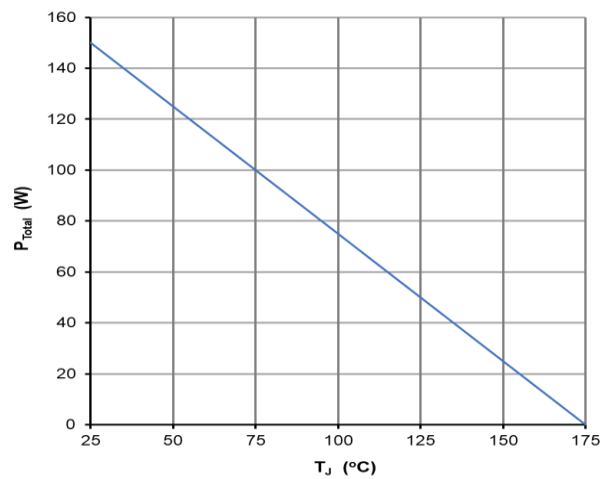


Figure 4. Power Derating

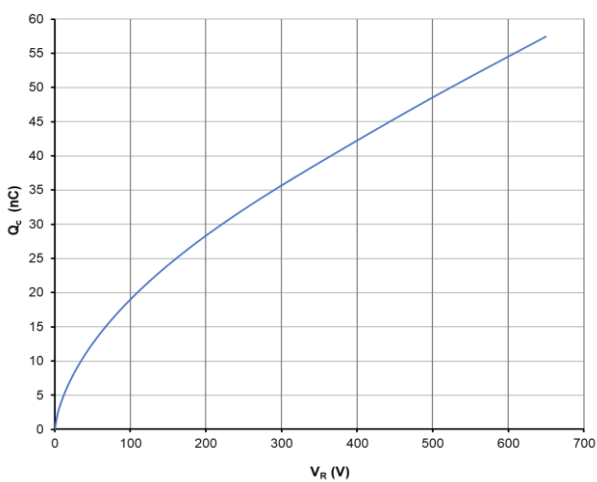


Figure 5. Capacitive charge vs. Reverse Voltage

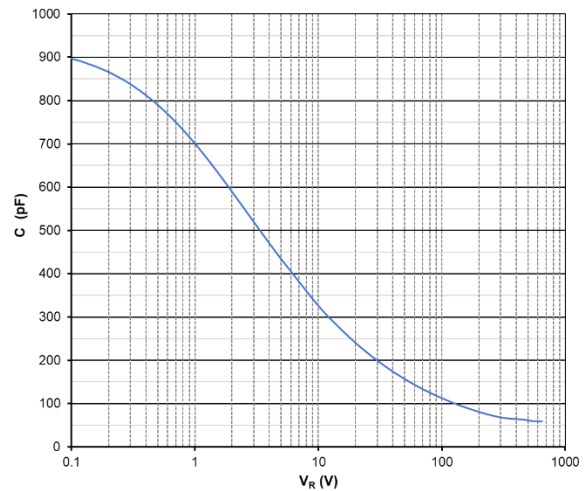
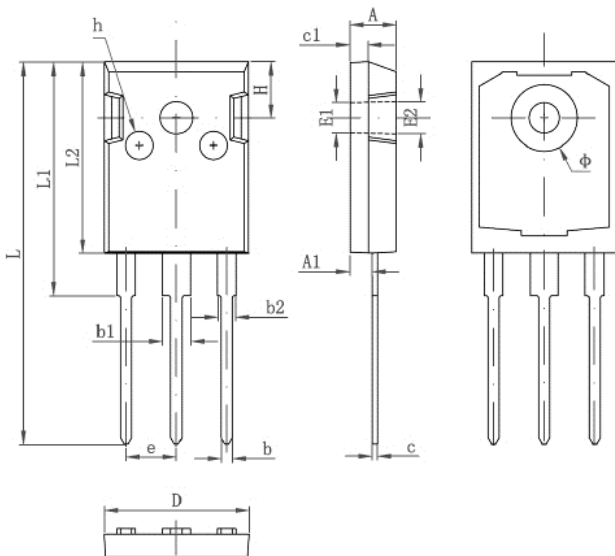


Figure 6. Capacitance vs. Reverse Voltage

## Package Dimensions

(TO-247-3 Package)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	
h	0.000	0.300	0.000	0.012

Part Number	Package	Packing	Marking
A5D40PD065BN	TO-247-3	30pcs / Tube	A5D40PD065BN