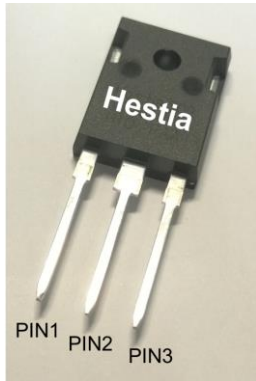
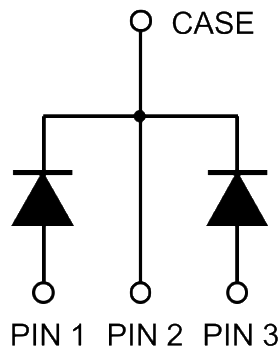


### Package TO-247-3L



### Inner Circuit



### Product Summary

$V_R$	1200 V	
$I_F$	42A** ( $T_c = 135^\circ\text{C}$ )	40A** ( $T_c = 140^\circ\text{C}$ )
$Q_C$	96 nC**	



### Features

- ◆ Low Conduction and Switching Loss
- ◆ Positive Temperature Coefficient on  $V_F$
- ◆ Temperature Independent Switching Behavior
- ◆ Fast Reverse Recovery
- ◆ High Surge Current Capability
- ◆ Pb-free lead plating

### Benefits

- ◆ Higher System Efficiency
- ◆ Parallel Device Convenience
- ◆ High Temperature Application
- ◆ High Frequency Operation
- ◆ Hard Switching & High Reliability
- ◆ Environmental Protection

### Applications

- ◆ SMPS
- ◆ PFC
- ◆ Solar/ Wind Renewable Energy
- ◆ Power Inverters
- ◆ Motor Drives
- ◆ UPS

### Maximum Ratings

Parameter	Symbol	Test Conditions	Value	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$	$T_J = 25^\circ\text{C}$	1200	V
Peak Reverse Surge Voltage	$V_{RSM}$	$T_J = 25^\circ\text{C}$	1200	V
DC Blocking Voltage	$V_R$	$T_J = 25^\circ\text{C}$	1200	V
Continuous Forward Current	$I_F$	$T_C = 25^\circ\text{C}$	45*/90**	A
		$T_C = 135^\circ\text{C}$	21*/42**	A
		$T_C = 140^\circ\text{C}$	20*/40**	A

\*Per Leg \*\*Whole Device

### Maximum Ratings

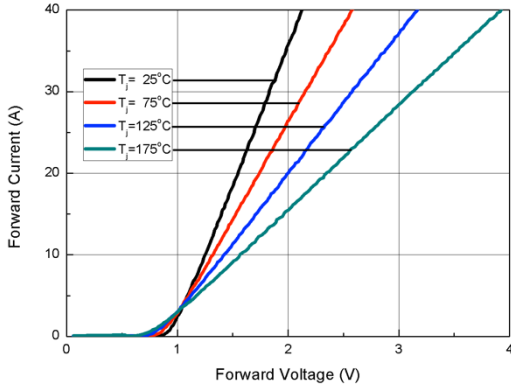
Parameter	Symbol	Test Conditions	Value	Unit
Non-Repetitive Peak Forward Surge Current	I <sub>FSM</sub>	T <sub>C</sub> = 25°C, T <sub>P</sub> = 10 ms Half Sine Wave	166*	A
		T <sub>C</sub> = 125°C, T <sub>P</sub> = 10 ms Half Sine Wave	152*	A
		T <sub>C</sub> = 25°C, T <sub>P</sub> = 10 μs Pulse	1062*	A
Repetitive Peak Forward Surge Current	I <sub>FRM</sub>	T <sub>C</sub> = 25°C, T <sub>P</sub> = 10 ms Half Sine Wave, D = 0.1	136*	A
		T <sub>C</sub> = 125°C, T <sub>P</sub> = 10 ms Half Sine Wave, D = 0.1	102*	A
Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = 25°C	250*	W
		T <sub>C</sub> = 125°C	83*	W
Operating Junction and Storage Temperature	T <sub>J</sub>		175	°C
	T <sub>stg</sub>		-55 to 175	°C
Thermal Resistance Junction to Case	R <sub>θJC</sub>		0.6*/0.3**	°C/W

\*Per Leg \*\*Whole Device

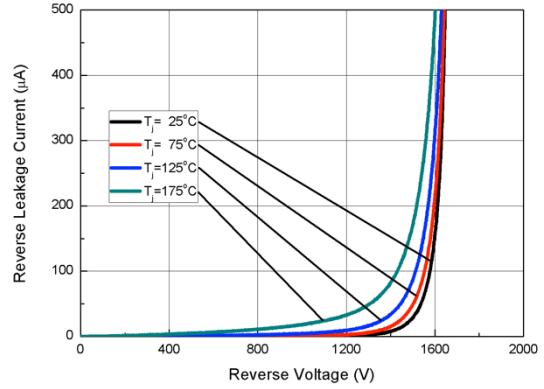
### Electrical Characteristics (Per Leg)

Parameter	Symbol	Test Conditions	Typ.	Max.	Unit
DC Blocking Voltage	V <sub>DC</sub>	I <sub>R</sub> = 500 μA, T <sub>J</sub> = 25°C	> 1200		V
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 20A, T <sub>J</sub> = 25°C	1.6	1.8	V
		I <sub>F</sub> = 20A, T <sub>J</sub> = 175°C	2.4	2.7	V
Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 1200V, T <sub>J</sub> = 25°C	2	100	μA
		V <sub>R</sub> = 1200V, T <sub>J</sub> = 175°C	20	1000	μA
Total Capacitive Charge	Q <sub>C</sub>	I <sub>F</sub> = 20A, dI/dt=300A/μs, V <sub>R</sub> =400V, T <sub>J</sub> =25°C	48		nC
Total Capacitance	C	V <sub>R</sub> =1V, T <sub>J</sub> =25°C, f = 1 MHz	1030		pF
		V <sub>R</sub> =400V, T <sub>J</sub> =25°C, f = 1 MHz	94		
		V <sub>R</sub> =800V, T <sub>J</sub> =25°C, f = 1 MHz	77		

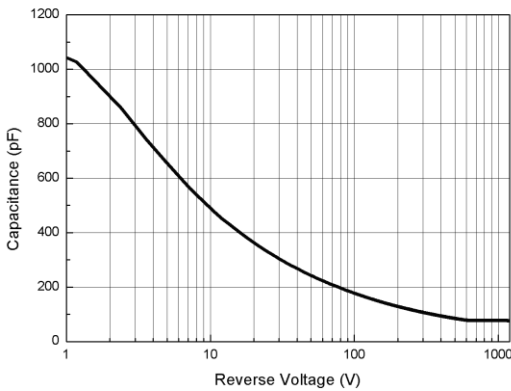
### Device Performances (Per Leg)



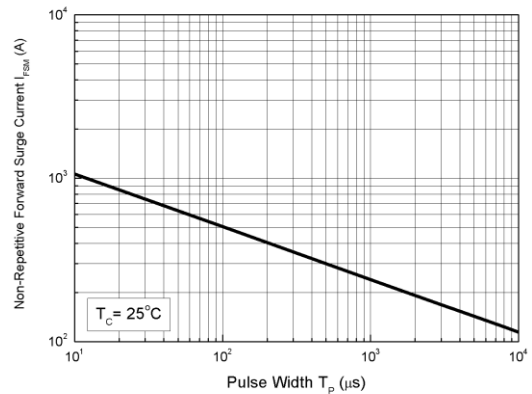
**Fig. 1 Forward Characteristics**



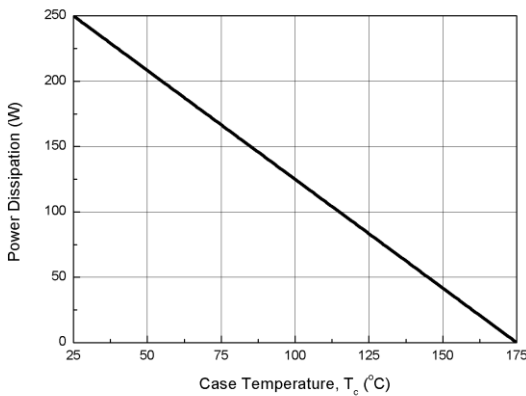
**Fig. 2 Reverse Characteristics**



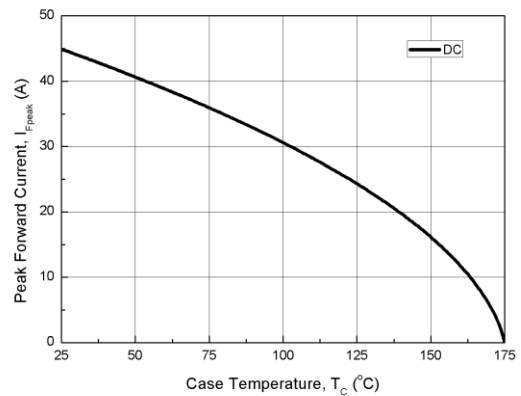
**Fig. 3 Capacitance vs. Reverse Voltage**



**Fig. 4 Non-Repetitive Peak Forward Surge Current (Pulse Mode)**

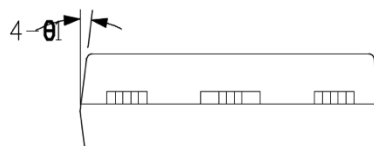
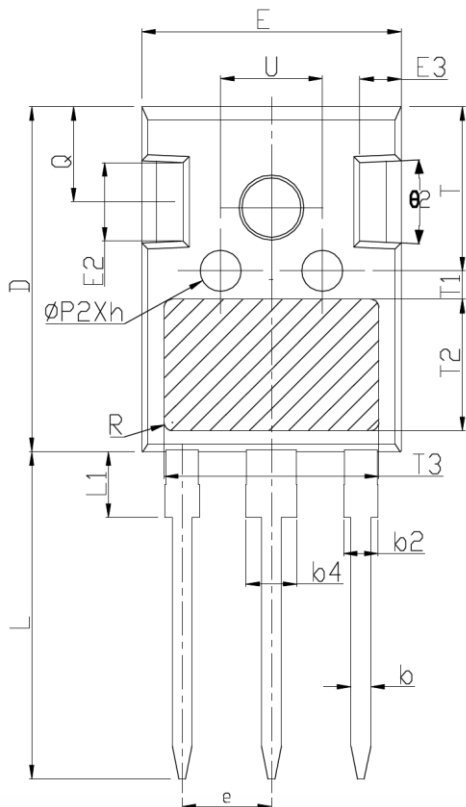
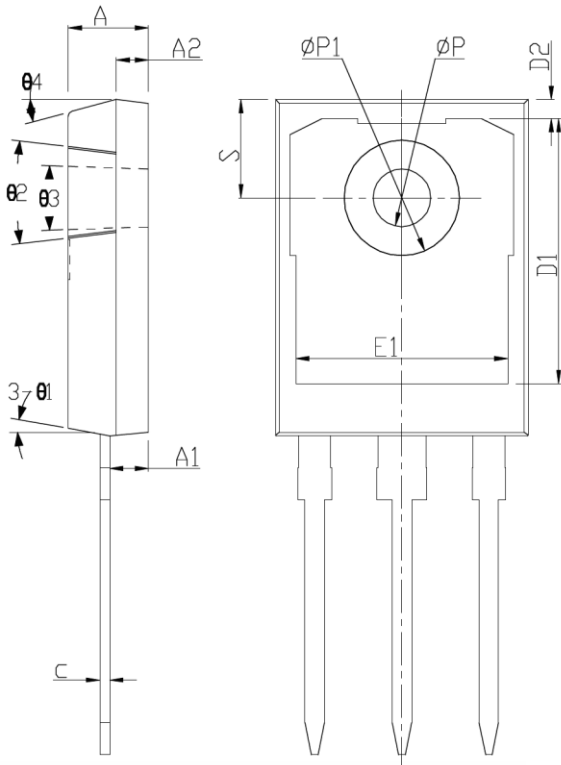


**Fig. 5 Power Derating**



**Fig. 6 Current Derating**

### Package Dimensions TO-247-3L



SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	4.75	5.00	5.25
A1	2.16	2.41	2.66
A2	1.85	2.00	2.15
b	1.11	1.21	1.35
b2	1.90	2.01	2.25
b4	2.90	3.01	3.25
c	0.51	0.61	0.75
D	20.60	21.00	21.40
D1	16.15	16.55	16.95
D2	1.00	1.20	1.40
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.70	5.00	5.30
E3	2.25	2.50	2.75
e	5.44BSC		
h	0.00	0.10	0.25
L	19.52	19.92	20.32
L1	-	-	4.30
phi P	3.35	3.60	3.85
phi P1	-	-	7.30
phi P2	2.25	2.50	2.75
Q	5.50	5.80	6.10
S	6.15BSC		
R	0.50REF		
T	9.70	-	10.30
T1	1.65REF		
T2	8.00REF		
T3	12.80REF		
U	5.90	-	6.50
theta 1	4°	7°	10°
theta 2	2°	5°	8°
theta 3	1°	-	2°
theta 4	10°	15°	20°

NOTES:  
 1. All dimensions are in mm.  
 2. Tolerance: ±0.05mm.