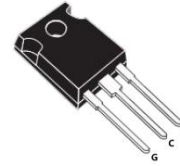


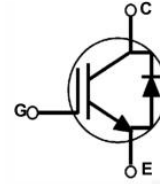
## Features

- High Current Capability
- Low Saturation Voltage:  
VCE(sat) = 1.19 V @ IC = 80 A
- High Input Impedance
- RoHS Compliant



## Applications

- PDP TV



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	
Collector to Emitter Voltage	V <sub>CES</sub>	330	V	
Gate to Emitter Voltage	V <sub>GES</sub>	±30		
Collector Current	I <sub>C</sub>	T <sub>C</sub> =25°C	180	A
		T <sub>C</sub> =100°C	80	
Pulsed Collector Current TC=25°C	I <sub>CM</sub>	450		
Diode forward current @ TC = 100°C	I <sub>F</sub>	40	A	
Maximum Power Dissipation TC=25°C	P <sub>D</sub>	420	W	
Maximum Power Dissipation TC=100°C		180		
Operating Junction Temperature	T <sub>J</sub>	-55 to 150	°C	
Storage Temperature Range	T <sub>stg</sub>	-55 to 150		
Maximum Lead Temp. for soldering Purposes, 1/8" from case for 5 seconds	T <sub>L</sub>	300		

## Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance, Junction to Case	R <sub>θJC</sub> (IGBT)		0.3	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub> (Diode)		0.8	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>		35	

## Package Marking and Ordering Information

Device Marking	Device	Package	MOQ
MSG80N350FL	MSG80N350FL	TO-247	

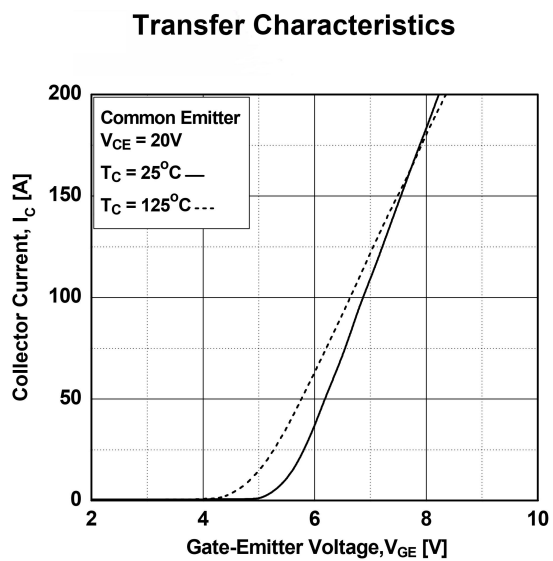
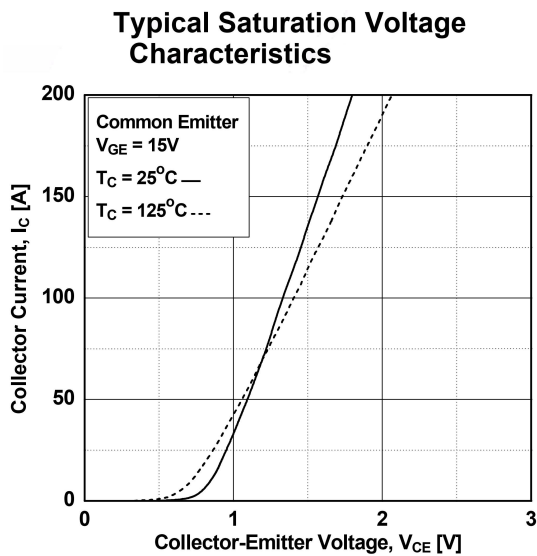
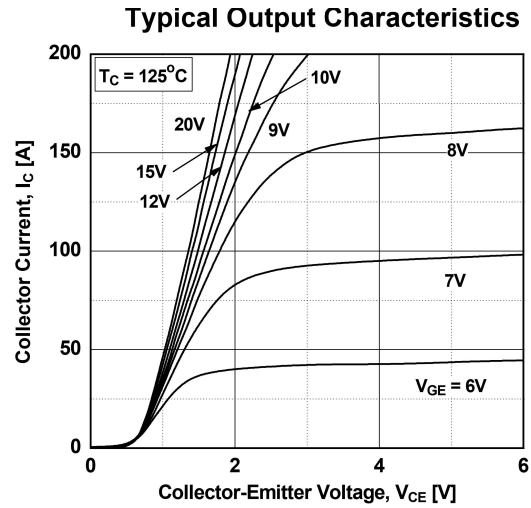
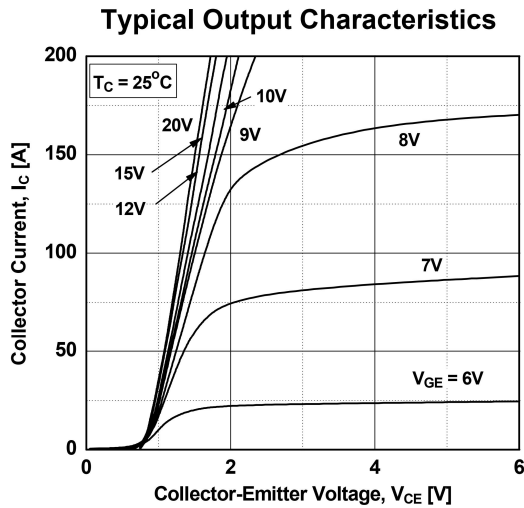
**Electrical Characteristics of the IGBT**  $T_C = 25^\circ\text{C}$  unless otherwise noted

Parameter	Symbo l	Test Conditions	Min	Typ	Max	Unit
<b>On/off Characteristics</b>						
G-E Threshold Voltag	$V_{GE(th)}$	$I_C = 250\mu\text{A}, V_{CE} = V_{GE}$	2.5	4	5.5	V
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 40\text{A}, V_{GE} = 15\text{V}$	-	1.19	1.45	
		$I_C = 180\text{A}, V_{GE} = 15\text{V}$	-	1.58	-	
		$I_C = 180\text{A}, V_{GE} = 15\text{V}$ $T_C = 125^\circ\text{C}$	-	1.78	-	
Collector to Emitter Breakdown Voltage	$B_{VCE}$	$V_{GE} = 0\text{V}, I_C = 400\mu$	330	-	-	
Collector Cut-Off Curren	$I_{CE}$	$V_{CE} = V_{CES}, V_{GE} = 0$	-	-	400	$\mu\text{A}$
G-E Leakage Curren	$I_{GE}$	$V_{GE} = V_{GES}, V_{CE} = 0\text{V}$	-	-	$\pm 400$	nA
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{ies}$	$V_{CE} = 30\text{V}, V_{GE} = 0\text{V}$ $f = 1\text{MHz}$	-	3900	-	pF
Output Capacitance	$C_{oes}$		-	320	-	
Reverse Transfer Capacitance	$C_{res}$		-	200	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{CC} = 200\text{V}, I_C = 40\text{A},$ $R_G = 5\Omega, V_{GE} = 15\text{V},$ Resistive Load, $T_C =$ $25^\circ\text{C}$	-	33	-	nS
Rise Tim	$t_r$		-	120	-	
Turn-Off Delay Tim	$t_{d(off)}$		-	160	-	
Fall Time	$t_f$		-	220	260	
Turn-On Delay Time	$t_{d(on)}$	$V_{CC} = 200\text{V}, I_C = 40\text{A},$ $R_G = 5\Omega, V_{GE} = 15\text{V},$ Resistive Load, $T_C =$ $125^\circ\text{C}$	-	38	-	
Rise Time	$t_r$		-	120	-	
Turn-Off Delay Tim	$t_{d(off)}$		-	163	-	
Fall Time	$t_f$		-	320	350	
Total Gate Charge	$Q_g$	$V_{CE} = 200\text{V}, I_C = 40\text{A},$ $V_{GE} = 15\text{V}$	-	175	-	nC
Gate to Emitter Charg	$Q_{ge}$		-	25	-	
Gate to Collector Charg	$Q_{gc}$		-	73	-	

**Electrical Characteristics of the Diode**  $T_C = 25^\circ\text{C}$  unless otherwise noted

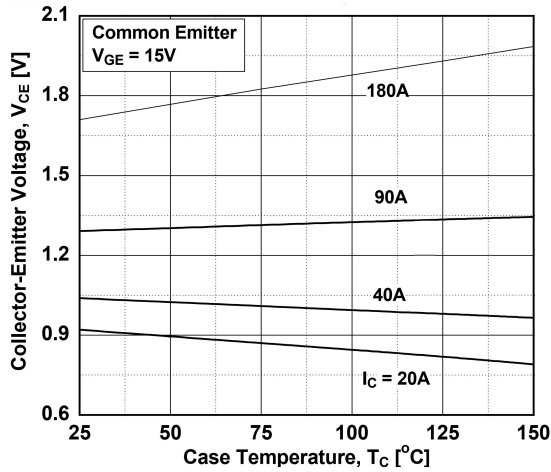
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Diode Forward Voltage	$V_{FM}$	$I_F = 20\text{A}$	$T_C=25^\circ\text{C}$	-	1..35	1.5	V
			$T_C=125^\circ\text{C}$	-	1	-	
Diode Reverse Recovery Time	$t_{rr}$	$I_F = 20\text{A},$ $di_F/dt = 200\text{A}/\mu\text{s}$	$T_C=25^\circ\text{C}$	-	33	-	ns
			$T_C=125^\circ\text{C}$	-	50	-	
Diode Peak Reverse Recovery Current	$I_{rr}$		$T_C=25^\circ\text{C}$	-	4	-	A
			$T_C=125^\circ\text{C}$	-	6	-	
Diode Reverse Recovery Charge	$Q_{rr}$		$T_C=25^\circ\text{C}$	-	50	-	nC
			$T_C=125^\circ\text{C}$	-	120	-	

**Typical Performance Characteristics**

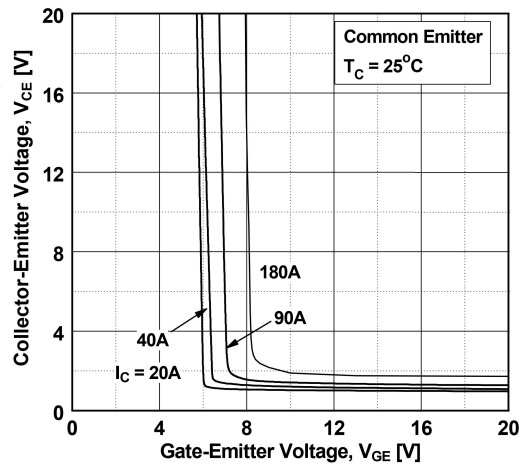




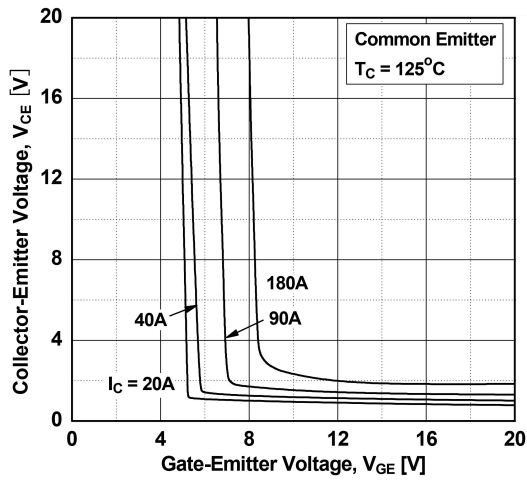
Saturation Voltage vs. Case Temperature at Variant Current Level



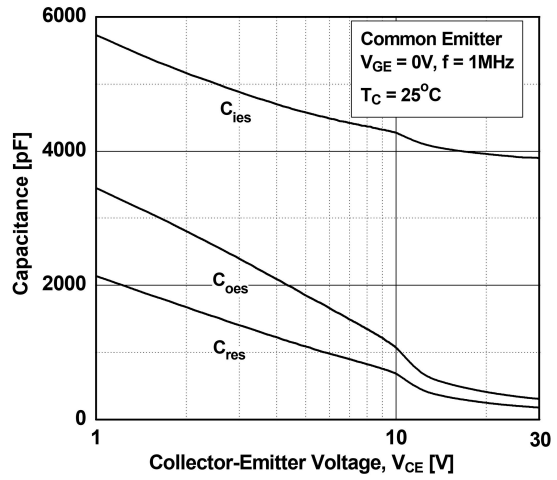
Saturation Voltage vs.  $V_{GE}$



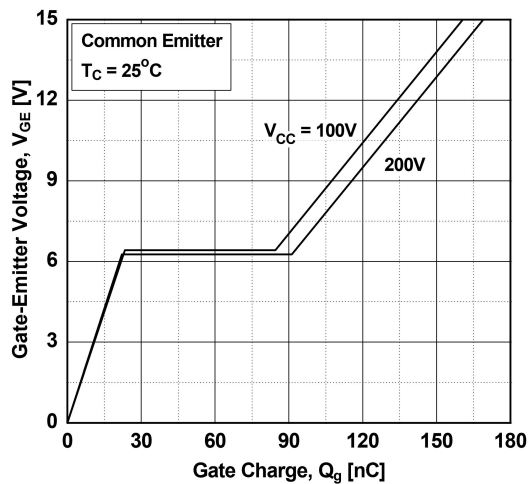
Saturation Voltage vs.  $V_{GE}$



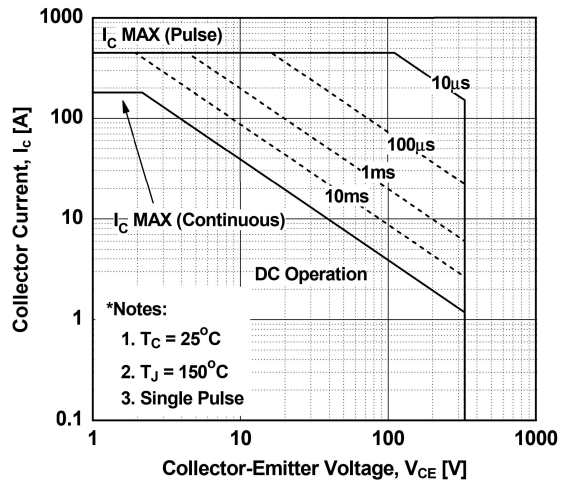
Capacitance Characteristics



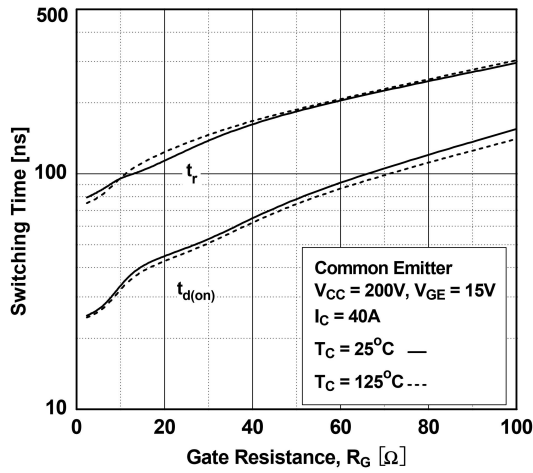
Gate charge Characteristics



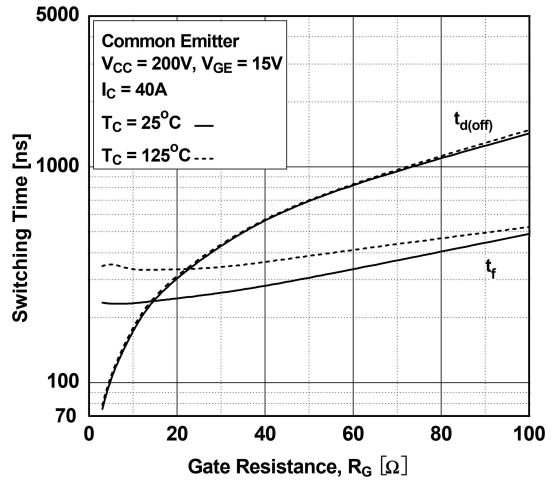
SOA Characteristics



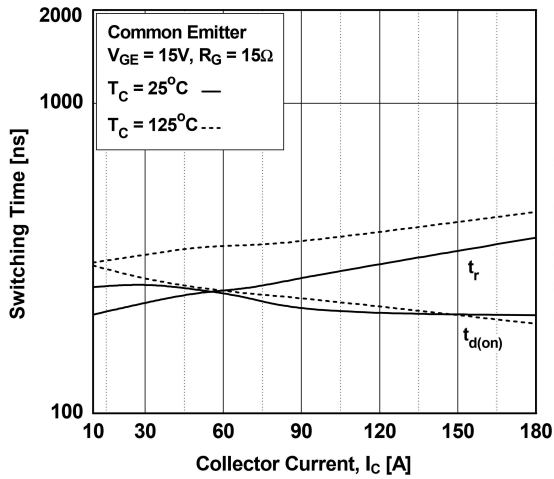
Turn-on Characteristics vs. Gate Resistance



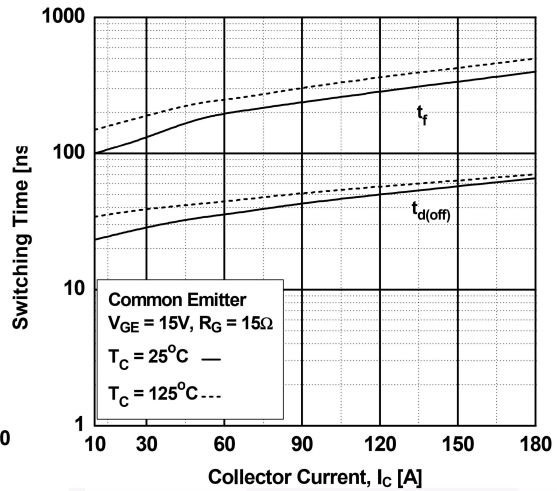
Turn-off Characteristics vs Gate Resistance



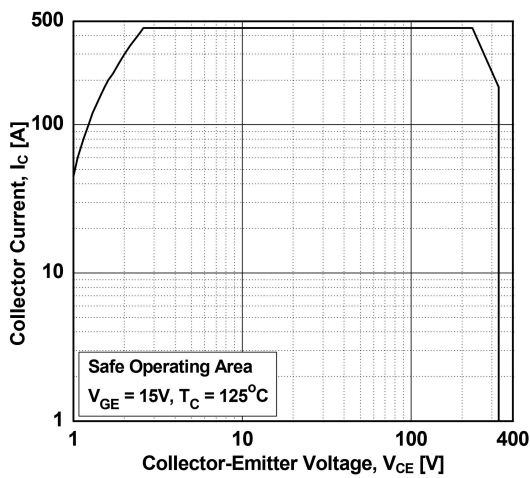
Turn-on Characteristics vs. Collector Current



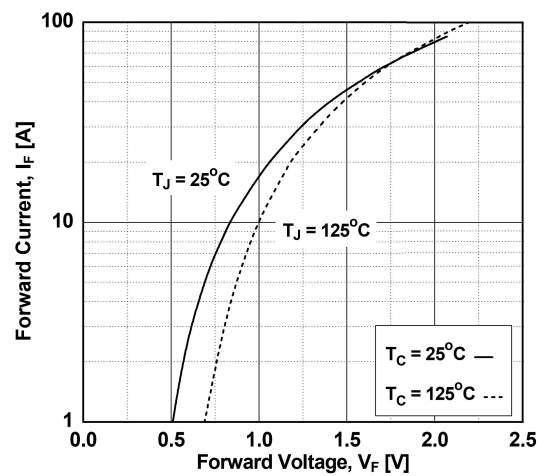
Turn-off Characteristics v Collector Current

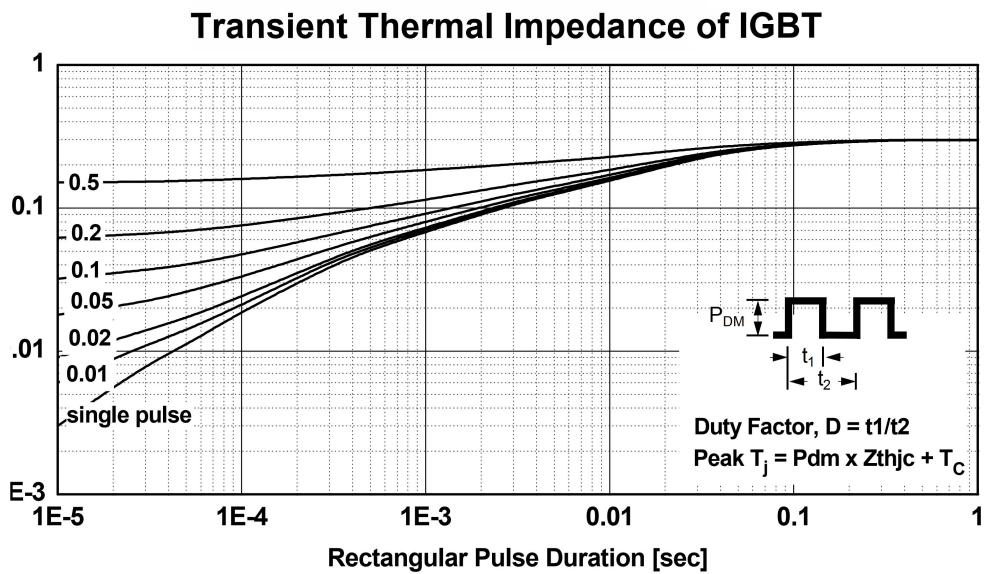
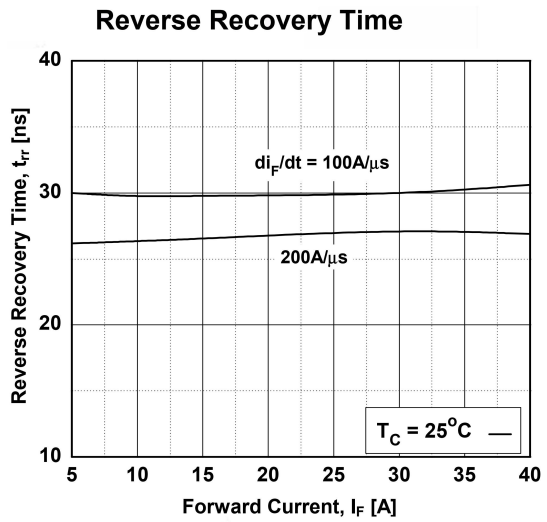
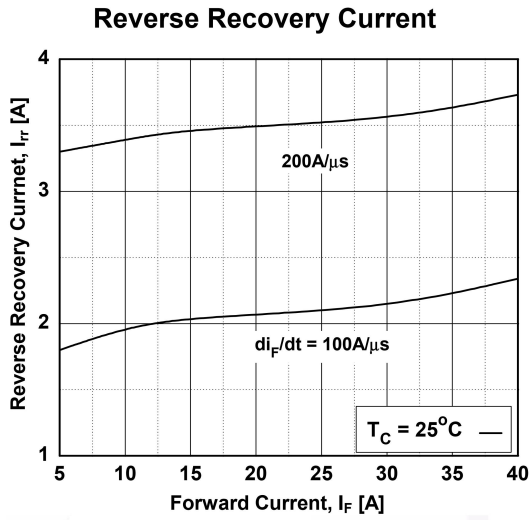


Turn off Switching SOA Characteristics



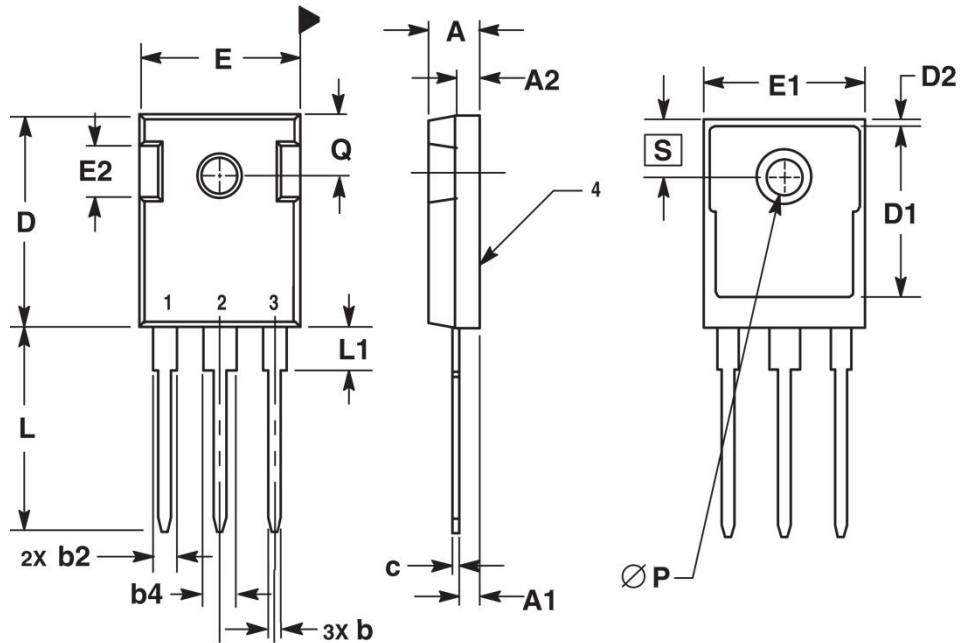
Forward Characteristics







Package outline dimension



Symbol	Min	Max	Unit
A	4.7	5.31	mm
A1	2.21	2.59	
A2	1.5	2.49	
b	1	1.4	
b2	1.65	2.39	
b4	2.59	3.43	
c	0.38	0.89	
D	20.8	21.46	
D1	13.08	-	
D2	0.51	1.35	
E	15.49	16.26	
E1	13.46	-	
E2	4.32	5.49	
e	5.46BSC		
L	19.81	20.32	
L1	-	4.5	
P	3.56	3.66	
Q	5.38	6.2	
S	6.15BSC		