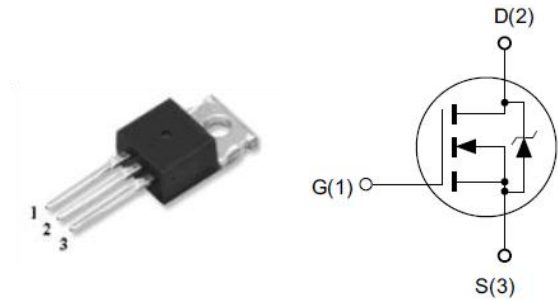


Features

- ◆ 80V, 313A, $R_{DS(on)}$ (Typ.) = $1.5m\Omega @ V_{GS} = 10V$
- ◆ Excellent $R_{DS(on)}$ and Low Gate Charge
- ◆ Halogen-free;RoHS-compliant
- ◆ 100% E_{AS} Guaranteed

Application

- ◆ Load Switch
- ◆ PWM Application
- ◆ Power Management



Absolute Maximum Ratings $T_c = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage ^a	80	V
V_{GS}	Gate-Source Voltage	± 20	
I_D	Drain Current-Continuous	$T_C = 25^\circ C$	A
		$T_C = 100^\circ C$	
I_{DM}	Drain Current-Pulsed ^b	1250	
P_D	Maximum Power Dissipation, $T_C = 25^\circ C$	312.5	W
E_{AS}	Single Pulsed Avalanche Energy ^c	2592	mJ
T_J, T_{STG}	Operating and Store Temperature Range	150, -55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.4	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	35	

Electrical Characteristics $T_J = 25^\circ C$ unless otherwise noted

■ Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	80	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 80V, V_{GS} = 0V$	-	-	1.0	μA
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = 10V, I_D = 20A$	-	1.5	1.9	mΩ

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	$V_{DS} = V_{GS} = 0V, f = 1.0MHz$	-	3.2	-	Ω
C_{iss}	Input Capacitance	$V_{DS} = 40V, V_{GS} = 0V, f = 1.0MHz$	-	13.65	-	nF
C_{oss}	Output Capacitance		-	4421	-	pF
C_{rss}	Reverse Transfer Capacitance		-	110	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 40V, V_{GS} = 10V, I_D = 20A, R_{GEN} = 3.0\Omega$	-	33	-	ns
t_r	Turn-On Rise Time		-	54	-	
$t_{d(off)}$	Turn-Off Delay Time		-	138	-	
t_f	Turn-Off Fall Time		-	73	-	
Q_g	Total Gate Charge	$V_{DS} = 40V, V_{GS} = 0 \text{ to } 10V, I_D = 20A$	-	200	-	nC
Q_{gs}	Gate-Source Charge		-	68	-	
Q_{gd}	Gate-Drain Charge		-	41	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	$V_G = V_D = 0V, \text{Force Current}$	-	-	313	A
I_{SM}	Maximum Pulsed Current		-	-	1250	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 20A$	-	0.7	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	$I_F = 20A, di_F/dt = 100A/\mu s$	-	115	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F = 20A, di_F/dt = 100A/\mu s$	-	331	-	nC

Notes:

- $T_J = +25^\circ C$ to $+150^\circ C$.
- Repetitive rating: pulse width limited by maximum junction temperature.
- $L = 1mH, V_{DD} = 25V, I_{AS} = 72A, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

■ Characteristic Curve

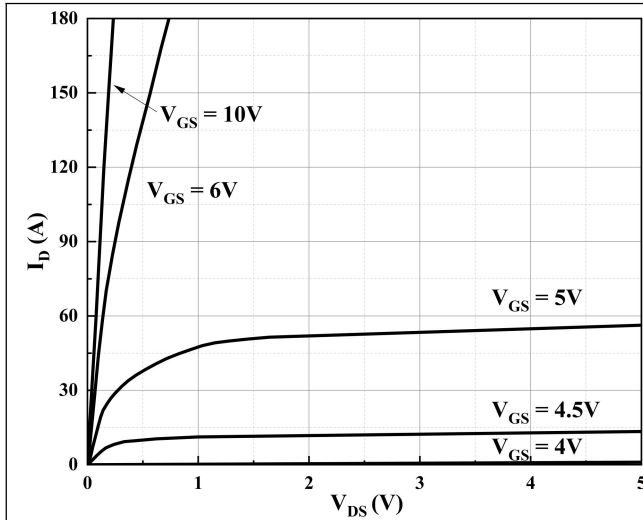


Figure 1. Typical Output Characteristics

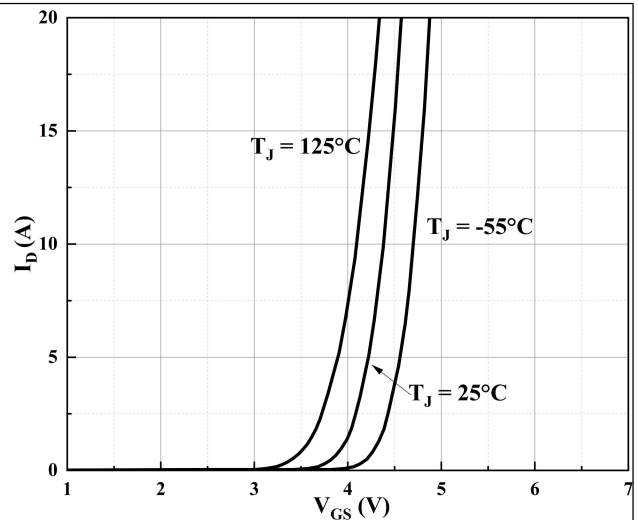


Figure 2. Typical Transfer Characteristics

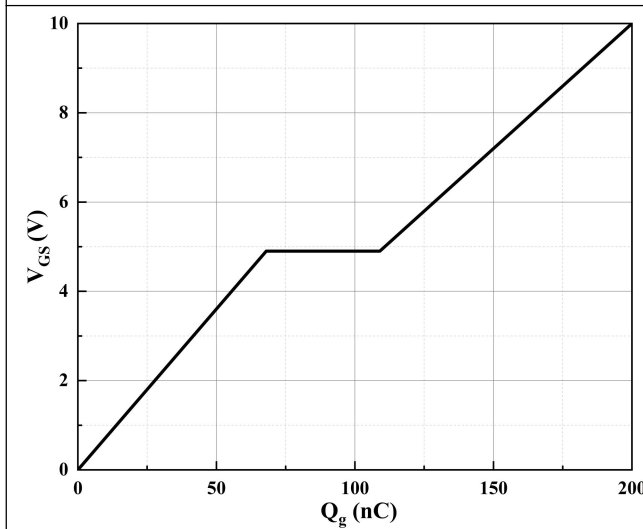


Figure 3. Typical Gate Charge

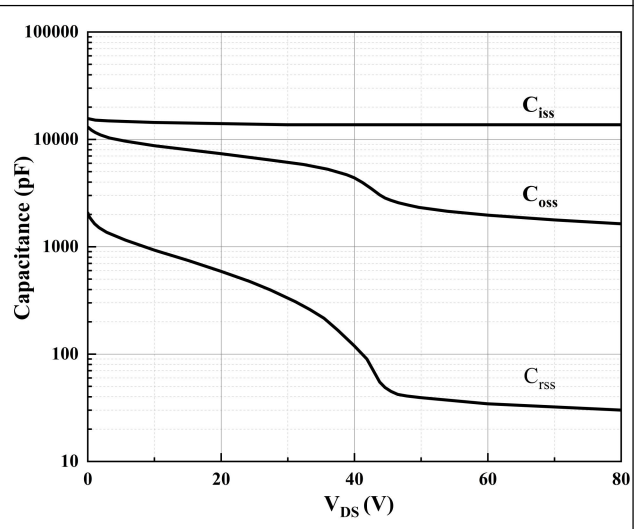


Figure 4. Typical Capacitance

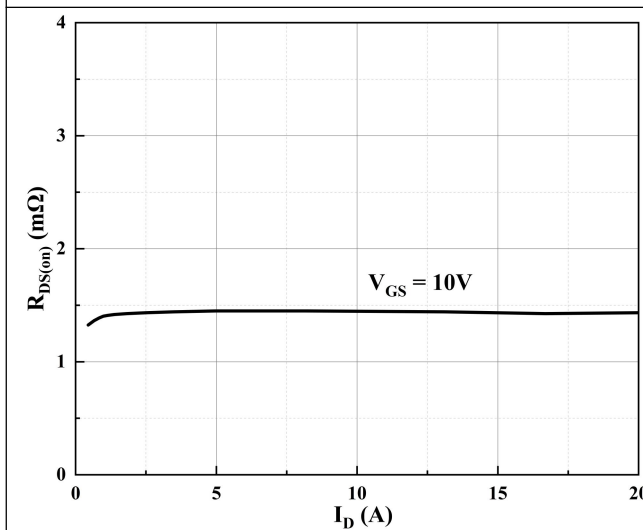


Figure 5. Static Drain-Source On-Resistance vs. Drain Current

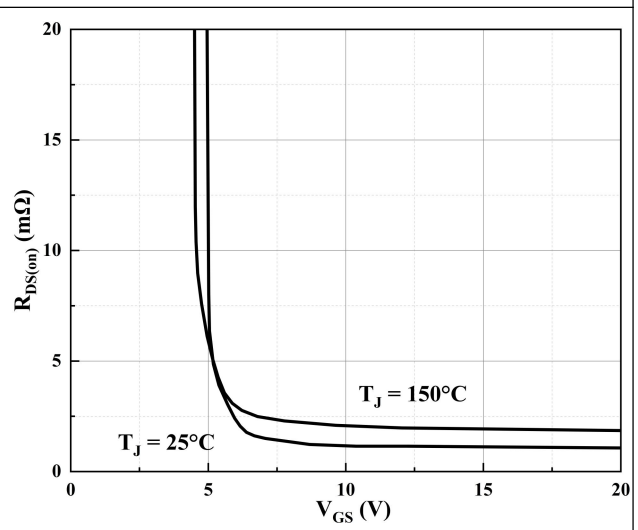


Figure 6. Static Drain-Source On-Resistance vs. Gate-Source Voltage

■ Characteristic Curve

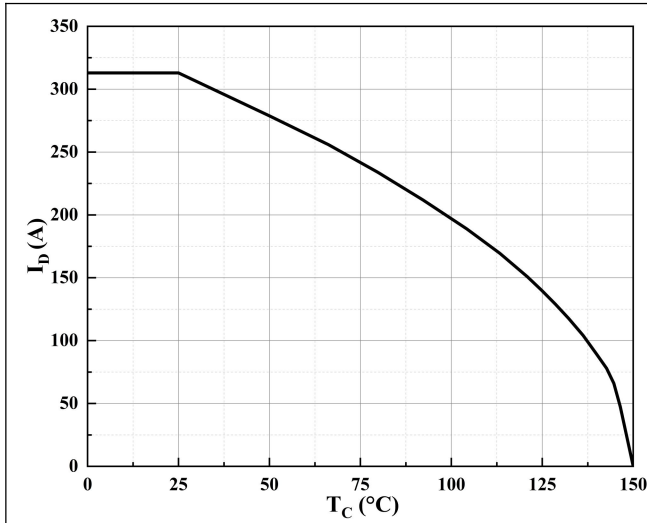


Figure 7. Maximum Continuous Drain Current vs. Case Temperature

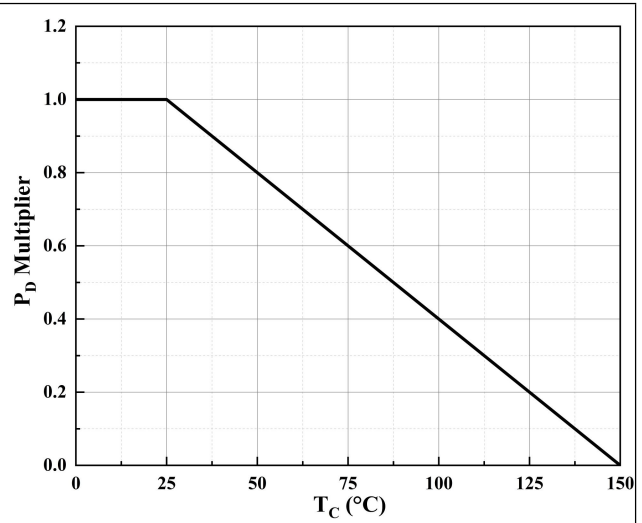


Figure 8. Maximum Power Dissipation Multiplier vs. Case Temperature

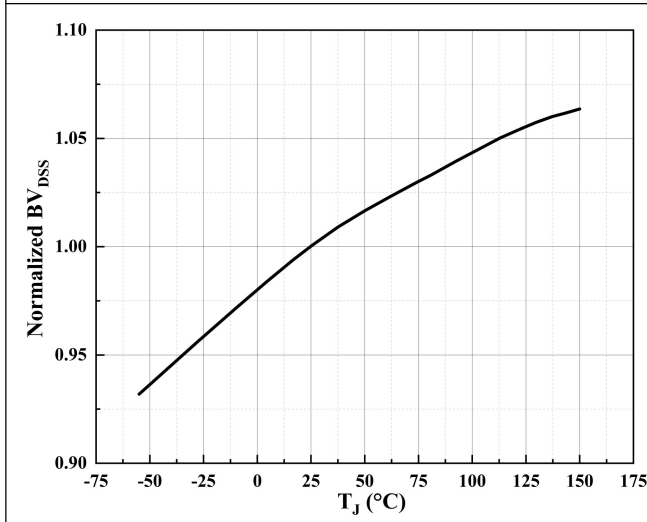


Figure 9. Normalized Drain-Source Breakdown Voltage vs. Junction Temperature

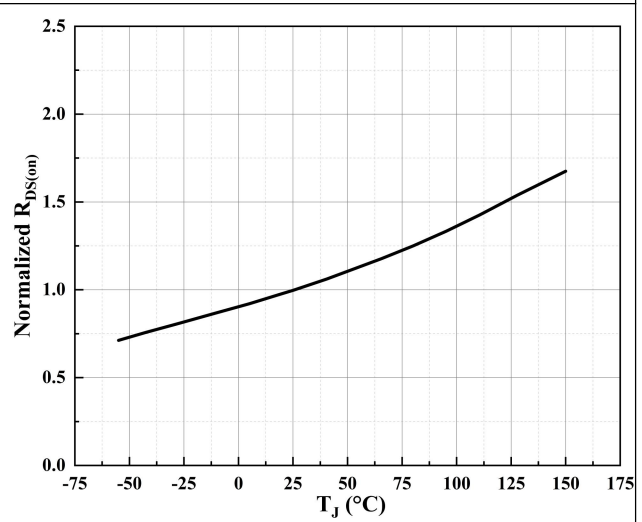


Figure 10. Normalized Static Drain-Source On-Resistance vs. Junction Temperature

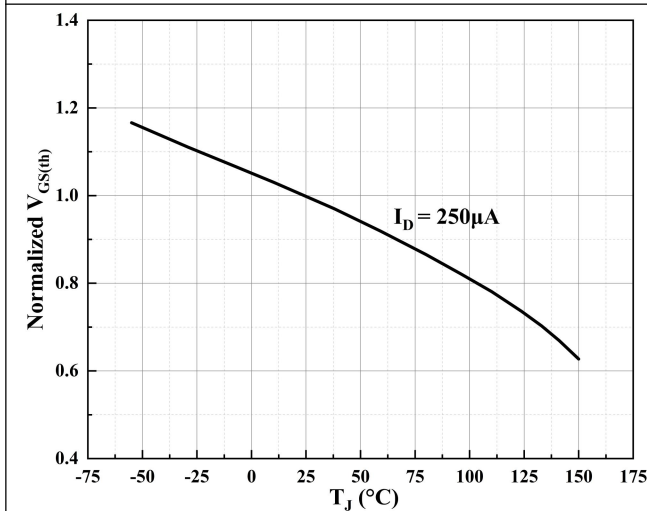


Figure 11. Normalized Threshold Voltage vs. Junction Temperature

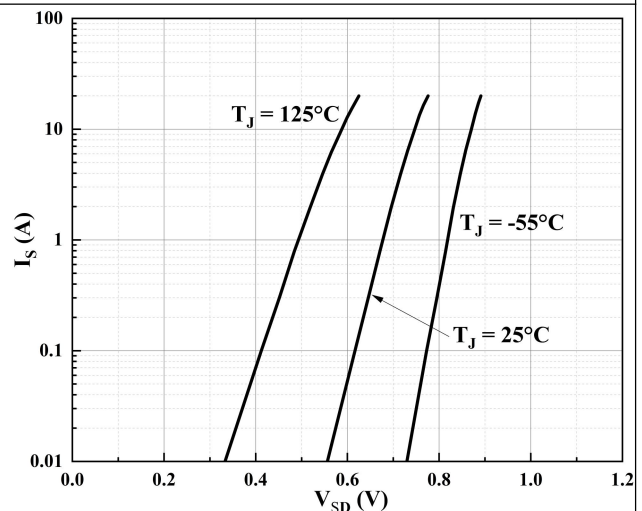
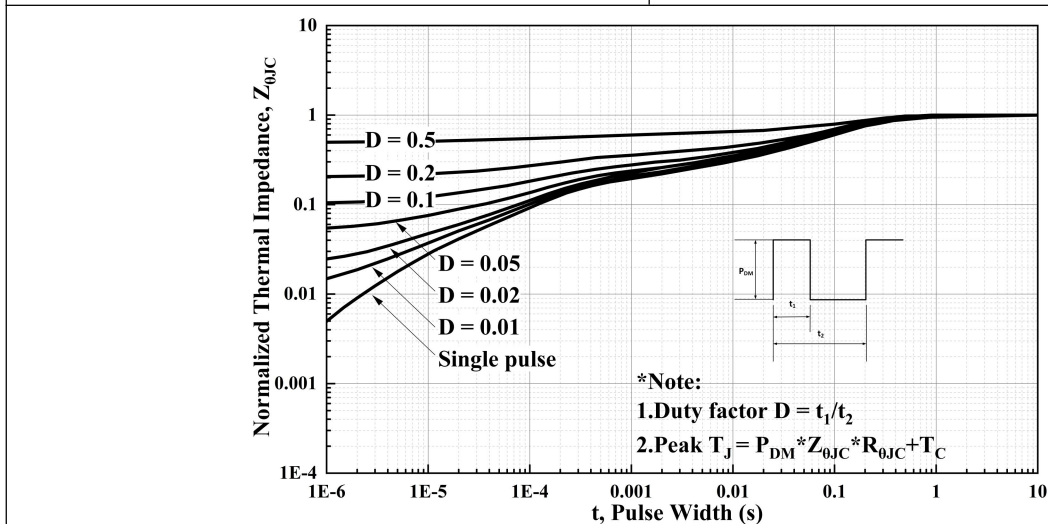
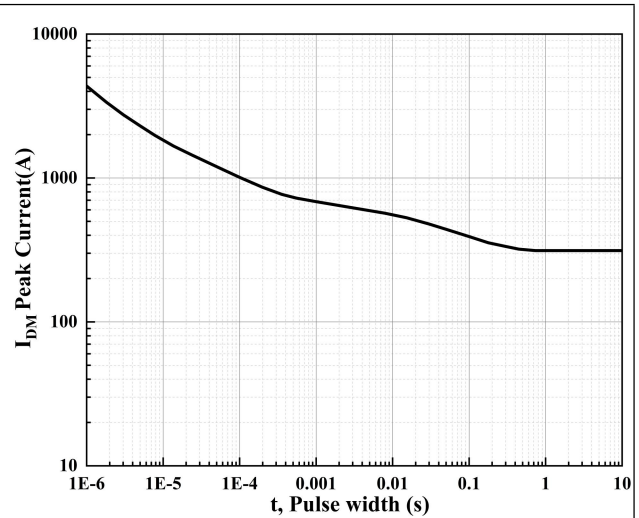
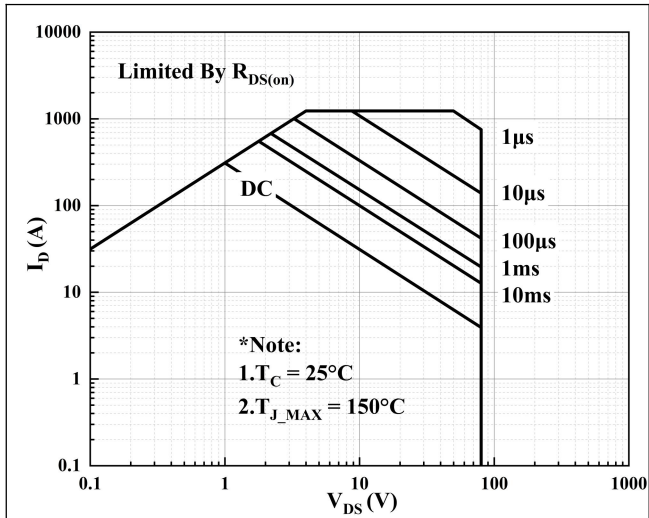


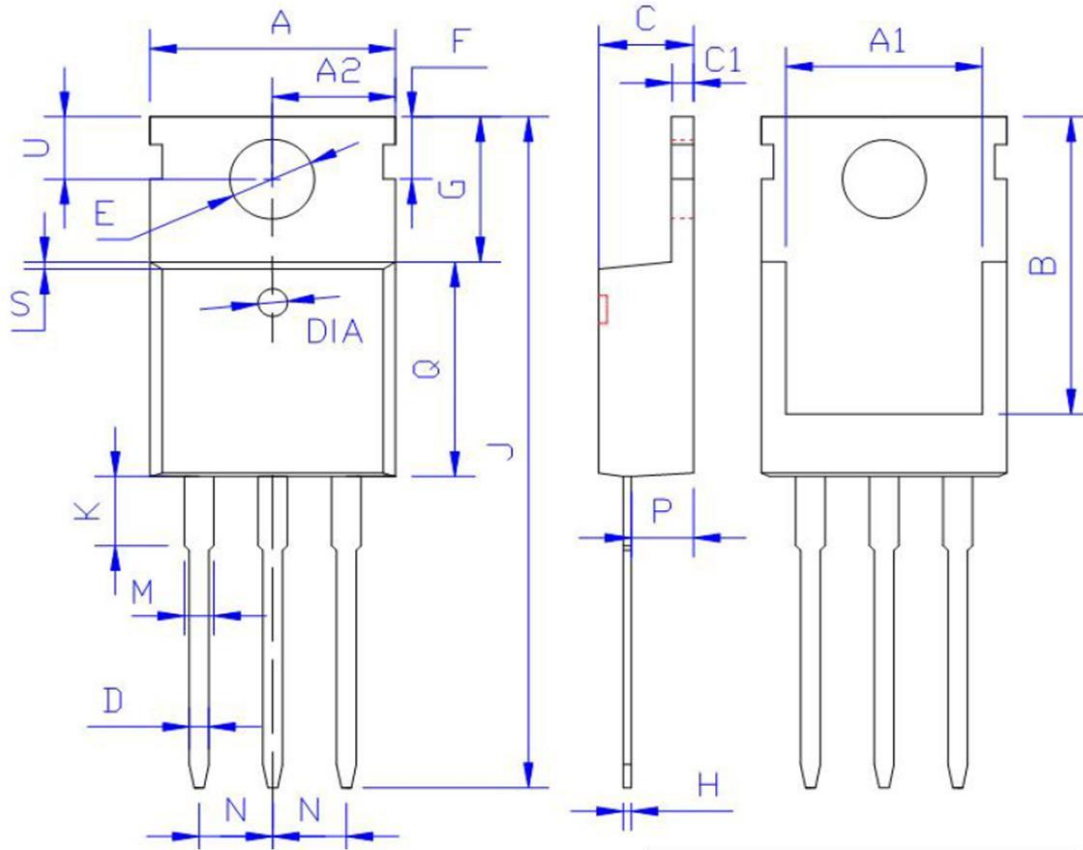
Figure 12. Body Diode Characteristics

Characteristic Curve



■ Package Information

TO-220



Dim.	Min.	Max.
A	9.80	10.20
A1	7.80	8.20
A2	4.80	5.20
B	13.00	13.40
C	4.35	4.65
C1	1.15	1.45
D	0.65	0.95
E	3.45	3.75
F	2.85	3.15
G	6.40	6.80
H	0.35	0.65
J	28.68	29.08
K	2.80	3.20
M	1.15	1.45
N	Typical 2.54	
P	2.20	2.60
Q	9.00	9.40
S	0.15	0.35
T	0.15	0.35
U	2.65	2.95
DIA	直径 1.5±0.1 深 MAX 0.5	
All Dimensions in millimeter		