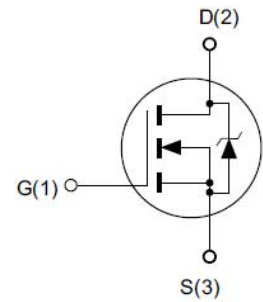


Features

- ◆ 150V, 130A, $R_{DS(on)}$ (Typ.) = 5.0mΩ@ $V_{GS} = 10V$
- ◆ Excellent $R_{DS(on)}$ and Low Gate Charge
- ◆ Halogen free; RoHS compliant
- ◆ 100% E_{AS} Guaranteed



Application

- ◆ Motor Driving in Power Tool, E-vehicle, Robotics
- ◆ Current Switching in DC/DC & AC/DC (SR) Sub systems
- ◆ Power Management in Telecom, Industrial Automation, CE

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

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage ^a		150	V
V_{GS}	Gate-Source Voltage		±20	
I_D	Drain Current-Continuous	$T_C = 25^\circ\text{C}$	130	A
		$T_C = 100^\circ\text{C}$	84	
I_{DM}	Drain Current-Pulsed ^b		190	
P_D	Maximum Power Dissipation, $T_C = 25^\circ\text{C}$		240	W
E_{AS}	Single Pulsed Avalanche Energy ^c		930	mJ
T_J, T_{STG}	Operating and Store Temperature Range		150, -55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.52	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	45	

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

■ Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	150	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 120V, V_{GS} = 0V$	-	-	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	$V_{GS} = 10V, I_D = 20A$	-	5.0	6.0	m Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{DS} = 75V,$ $V_{GS} = 0V,$ $f = 1.0MHz$	-	5800	-	pF
C_{oss}	Output Capacitance		-	550	-	
C_{rss}	Reverse Transfer Capacitance		-	17	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 75V,$ $V_{GS} = 10V,$ $R_L = 3.75\Omega,$ $R_{GEN} = 3\Omega$	-	21	-	ns
t_r	Turn-On Rise Time		-	39	-	
$t_{d(off)}$	Turn-Off Delay Time		-	63	-	
t_f	Turn-Off Fall Time		-	32	-	
Q_g	Total Gate Charge	$V_{DS} = 75V,$ $V_{GS} = 0 \text{ to } 10V,$ $I_D = 20A$	-	83	-	nC
Q_{gs}	Gate-Source Charge		-	28	-	
Q_{gd}	Gate-Drain Charge		-	19.2	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	$V_G = V_D = 0V,$ Force Current	-	-	130	A
I_{SM}	Maximum Pulsed Current		-	-	190	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 1A$	-	-	1.0	V
T_{rr}	Body Diode Reverse Recovery Time	$I_F = 15A,$ $di_F/dt = 100A/\mu s$	-	98	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F = 15A,$ $di_F/dt = 100A/\mu s$	-	316	-	nC

Notes:

- $T_J = +25^\circ C$ to $+150^\circ C$.
- Repetitive rating: pulse width limited by maximum junction temperature.
- $L = 0.5mH, V_{DD} = 50V, I_{AS} = 61A, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

■ Characteristic Curve

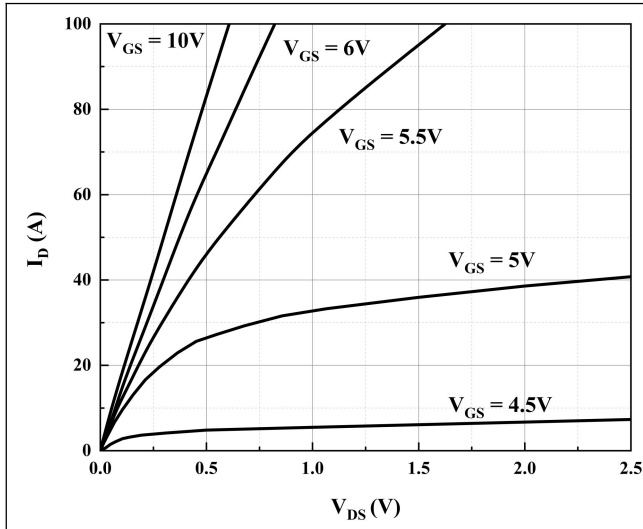


Figure 1. Typical Output Characteristics

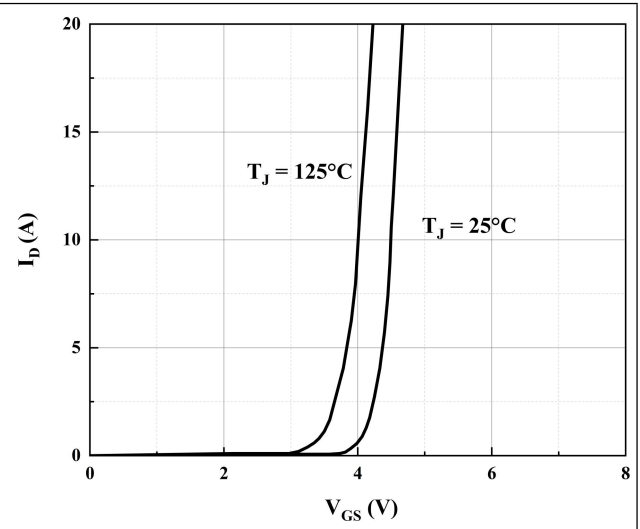


Figure 2. Typical Transfer Characteristics

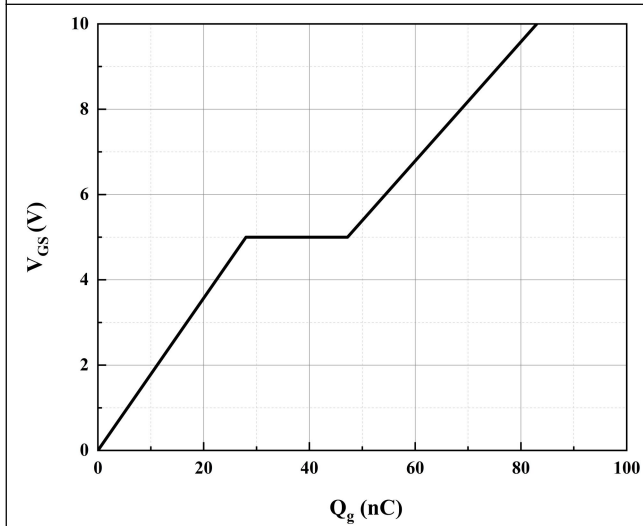


Figure 3. Typical Gate Charge

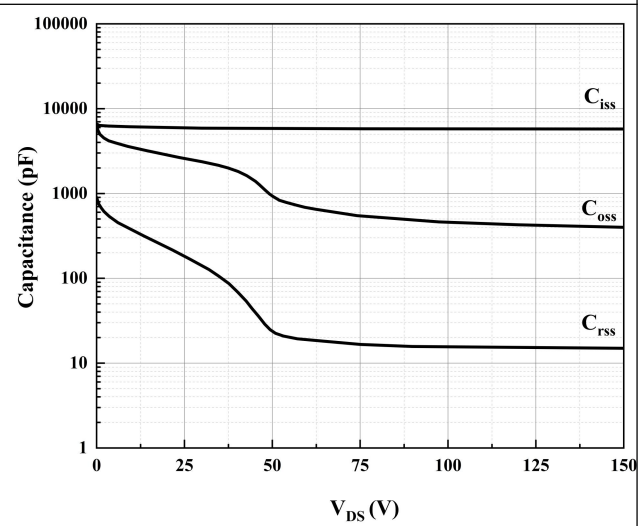


Figure 4. Typical Capacitance

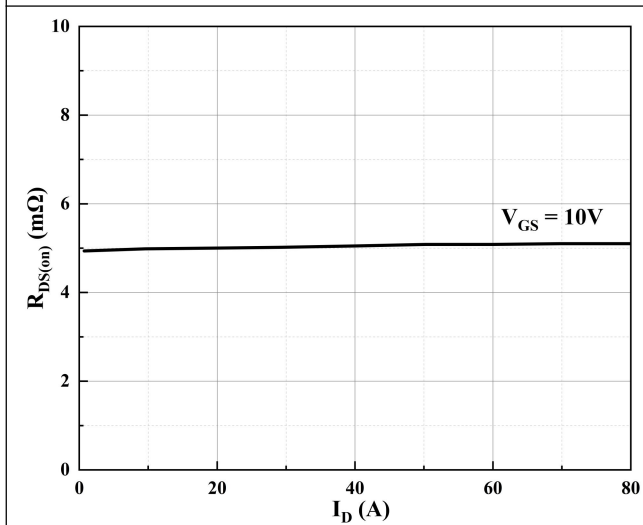


Figure 5. On-Resistance vs. Drain Current

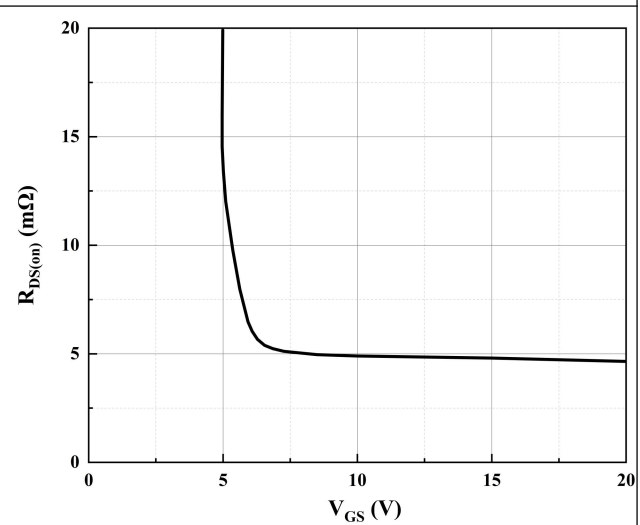


Figure 6. On-Resistance vs. Gate-Source Voltage

■ Characteristic Curve

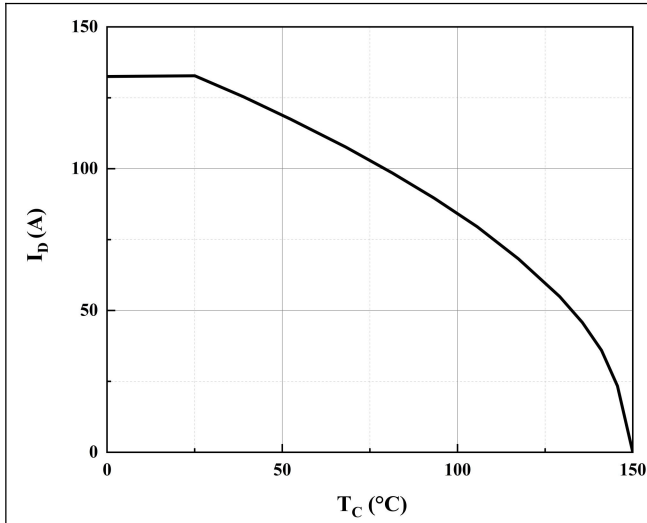


Figure 7. Maximum Continuous Drain Current vs. Case Temperature

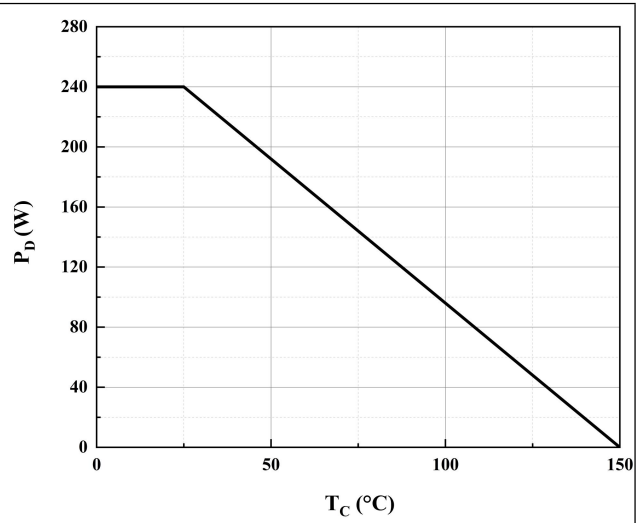


Figure 8. Power Dissipation

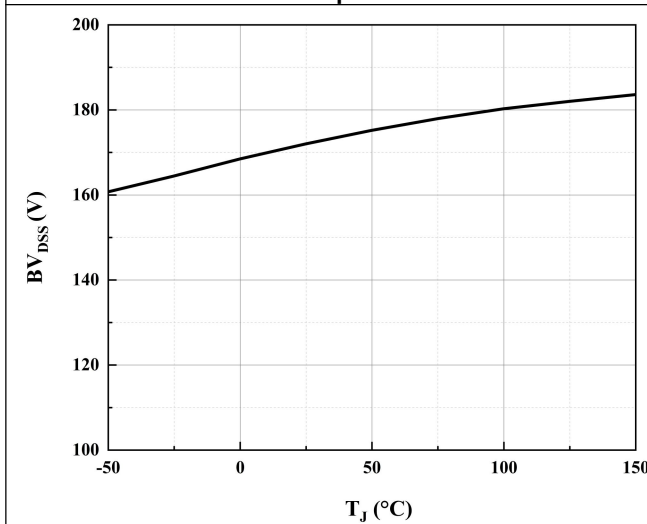


Figure 9. Drain-Source Breakdown Voltage vs. Junction Temperature

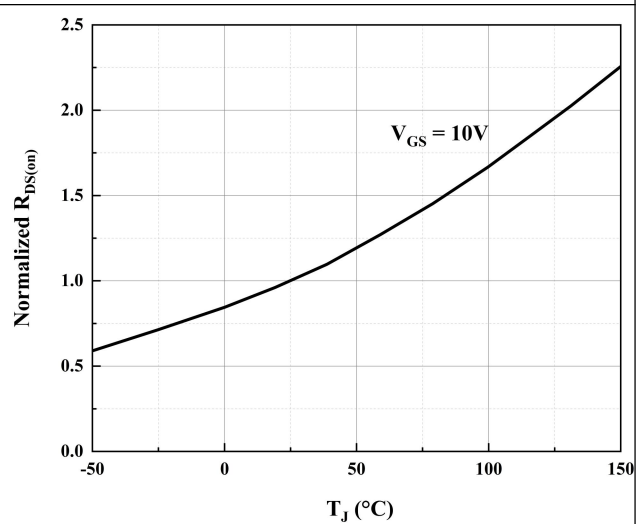


Figure 10. Normalized On-Resistance vs. Junction Temperature

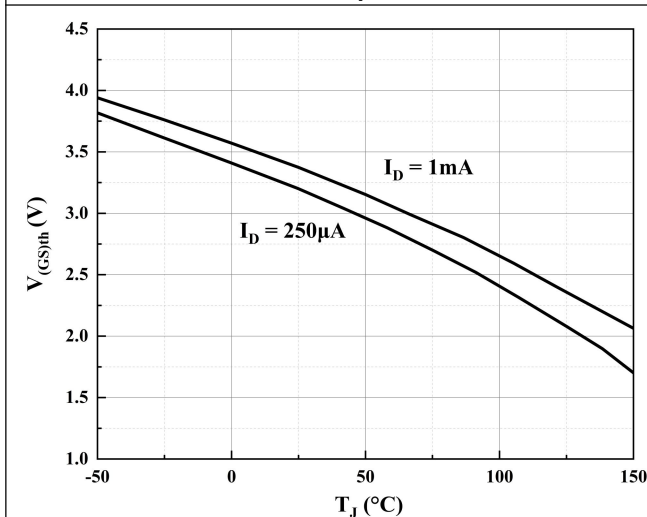


Figure 11. Gate Threshold Voltage vs. Junction Temperature

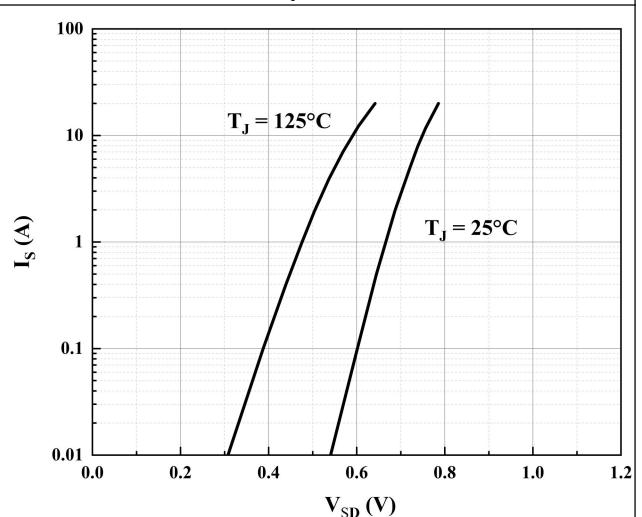
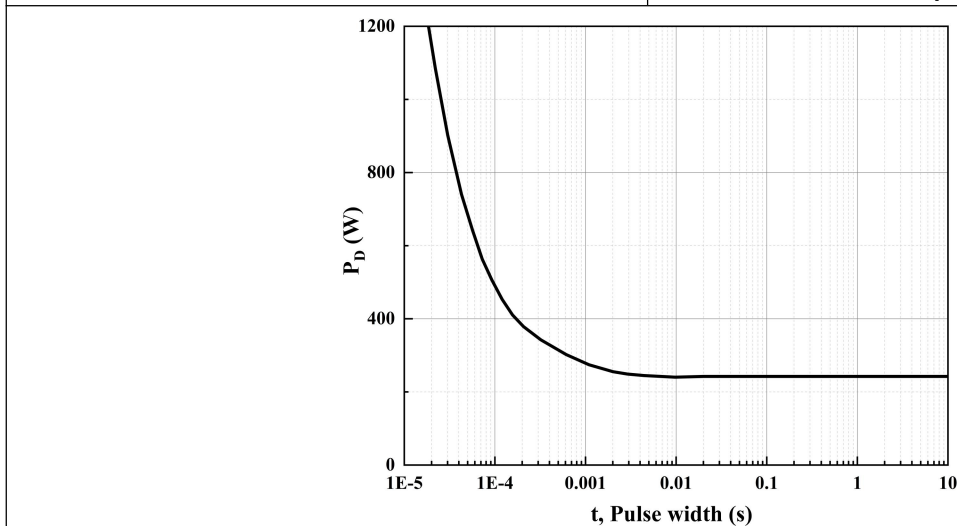
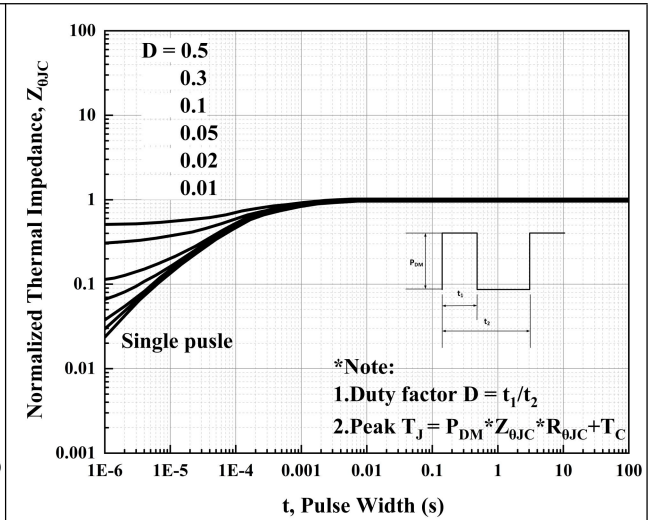
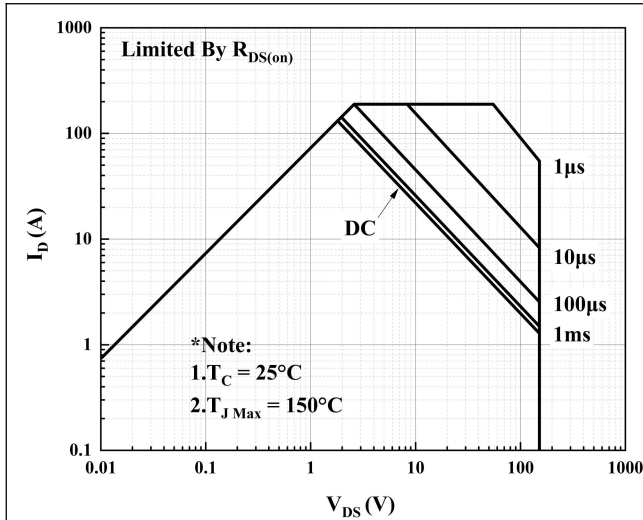


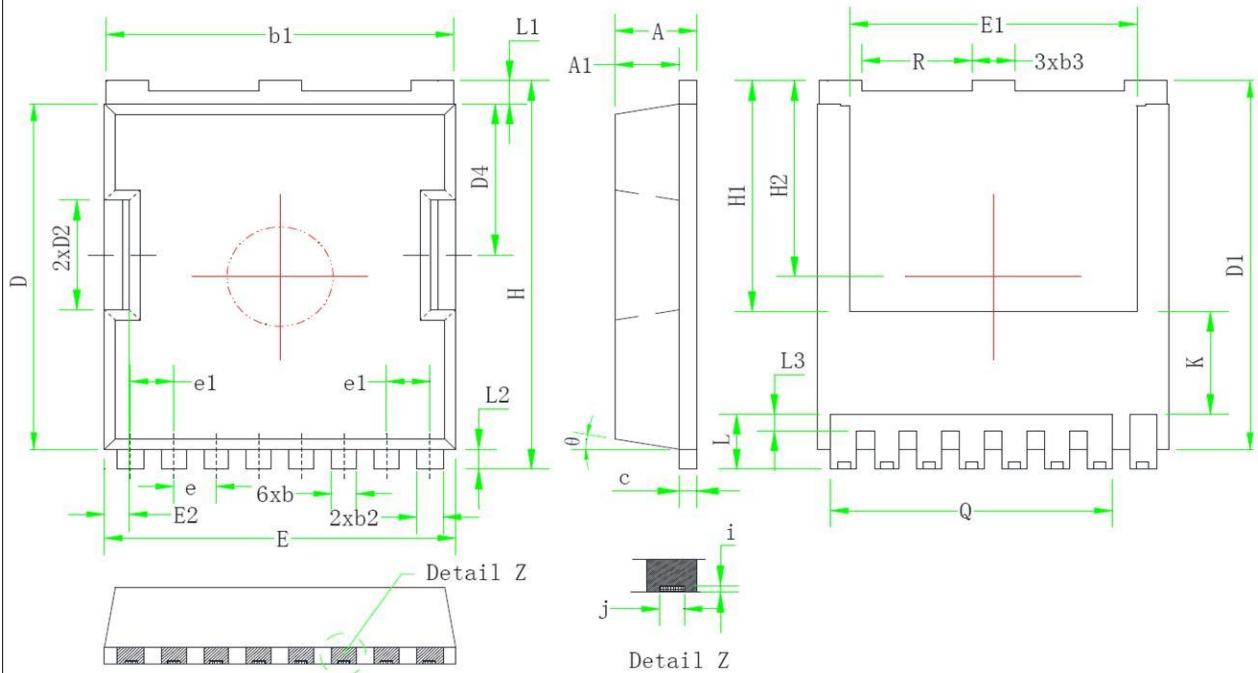
Figure 12. Body Diode Characteristics

■ Characteristic Curve



Package Information

TOLL



Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	2.25	2.30	2.35	E2	0.65	0.70	0.75
A1	1.75	1.80	1.85	H	11.60	11.70	11.80
b	0.65	0.70	0.75	H1	6.95 BSC		
b1	9.75	9.80	9.85	H2	5.90 BSC		
b2	0.70	0.75	0.80	i	0.10 REF		
b3	1.15	1.20	1.25	j	0.35 REF		
c	0.45	0.50	0.55	K	3.10 REF		
D	10.35	10.40	10.45	L	1.55	1.65	1.75
D1	11.00	11.10	11.20	L1	0.65	0.70	0.75
D2	3.25	3.30	3.35	L2	0.50	0.60	0.70
D4	4.50	4.55	4.60	L3	0.40	0.50	0.60
e	1.20 BSC			Q	7.95 REF		
e1	1.225 BSC			R	3.05	3.10	3.15
E	9.85	9.90	9.95	θ	10°REF		
E1	8.00	8.10	8.20				