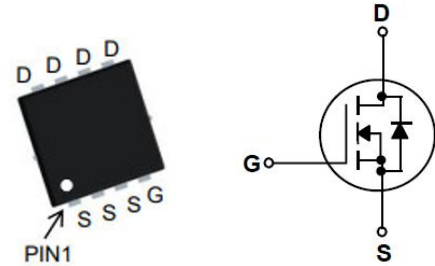


Features

- ◆ 100V, 109A, $R_{DS(on)}$ (Typ.) = $4.4m\Omega @ V_{GS} = 10V$
- ◆ Excellent $R_{DS(on)}$ and Low Gate Charge
- ◆ Halogen-free; RoHS-compliant
- ◆ 100% E_{AS} Guaranteed

Application

- ◆ High Frequency Switching and Synchronous
- ◆ DC/DC Converter
- ◆ Power Management



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

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage ^a	100	V
V_{GS}	Gate-Source Voltage	± 20	
I_D	Drain Current-Continuous	$T_c = 25^\circ\text{C}$	A
		$T_c = 100^\circ\text{C}$	
I_{DM}	Drain Current-Pulsed ^b	435	
P_D	Maximum Power Dissipation, $T_c = 25^\circ\text{C}$	125	W
E_{AS}	Single Pulsed Avalanche Energy ^c	294	mJ
T_J, T_{STG}	Operating and Store Temperature Range	150, -55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.0	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	43	

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	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	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	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	-	2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = 10V, I_D = 20A$	-	4.4	5.7	mΩ
		$V_{GS} = 4.5V, I_D = 15A$	-	6.4	8.3	mΩ

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	$V_{DS} = V_{GS} = 0V,$ $f = 1.0MHz$	-	1.0	-	Ω
C_{iss}	Input Capacitance	$V_{DS} = 50V,$ $V_{GS} = 0V,$ $f = 1.0MHz$	-	2326	-	pF
C_{oss}	Output Capacitance		-	1160	-	
C_{rss}	Reverse Transfer Capacitance		-	23	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 50V,$ $V_{GS} = 10V,$ $I_D = 20A,$ $R_{GEN} = 3.0\Omega$	-	11	-	ns
t_r	Turn-On Rise Time		-	20	-	
$t_{d(off)}$	Turn-Off Delay Time		-	30	-	
t_f	Turn-Off Fall Time		-	8	-	
Q_g	Total Gate Charge	$V_{DS} = 50V,$ $V_{GS} = 0 \text{ to } 10V,$ $I_D = 20A$	-	36	-	nC
Q_{gs}	Gate-Source Charge		-	7.9	-	
Q_{gd}	Gate-Drain Charge		-	7.4	-	

■ 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	-	-	109	A
I_{SM}	Maximum Pulsed Current		-	-	435	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 30A$	-	0.7	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	$I_F = 20A,$ $dl_F/dt = 100A/\mu s$	-	52	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F = 20A,$ $dl_F/dt = 100A/\mu s$	-	66	-	nC

Notes:

- $T_J = +25^\circ C$ to $+150^\circ C$.
- Repetitive rating: pulse width limited by maximum junction temperature.
- $L = 3mH, V_{DD} = 50V, I_{AS} = 14A, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 0.5\%$.

■ Characteristic Curve

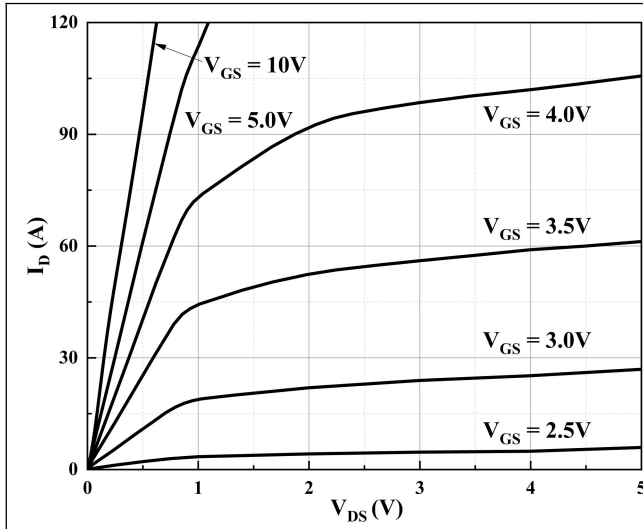


Figure 1. Typical Output Characteristics

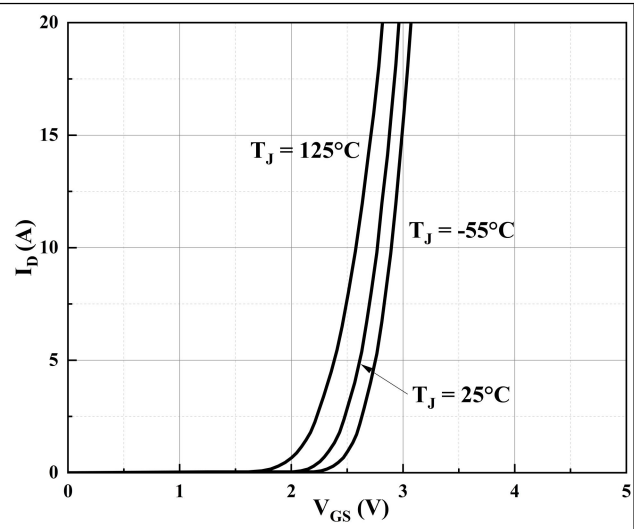


Figure 2. Typical Transfer Characteristics

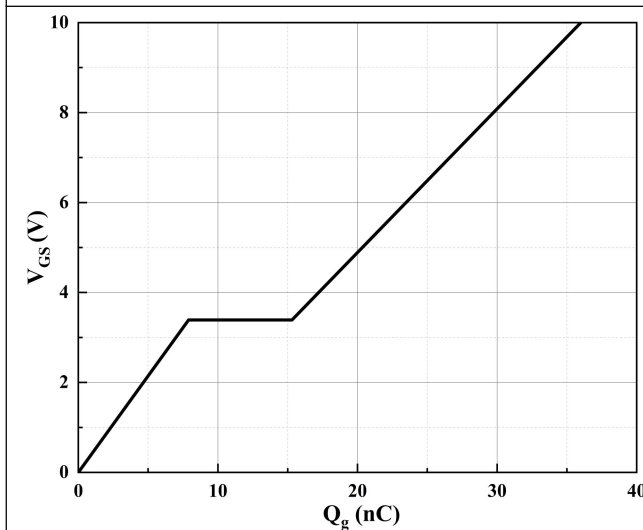


Figure 3. Typical Gate Charge

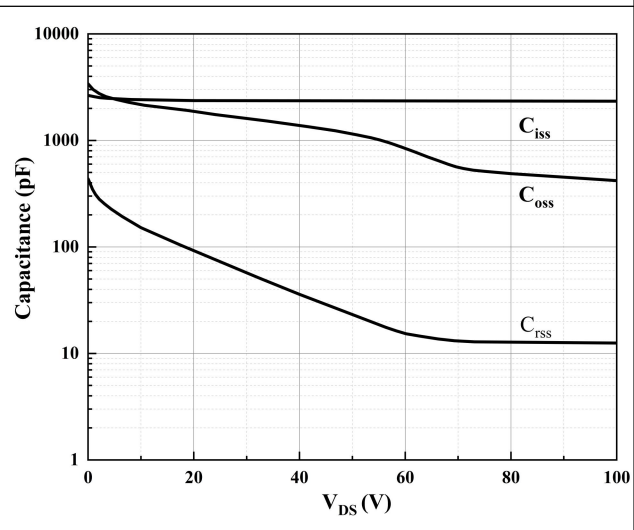


Figure 4. Typical Capacitance

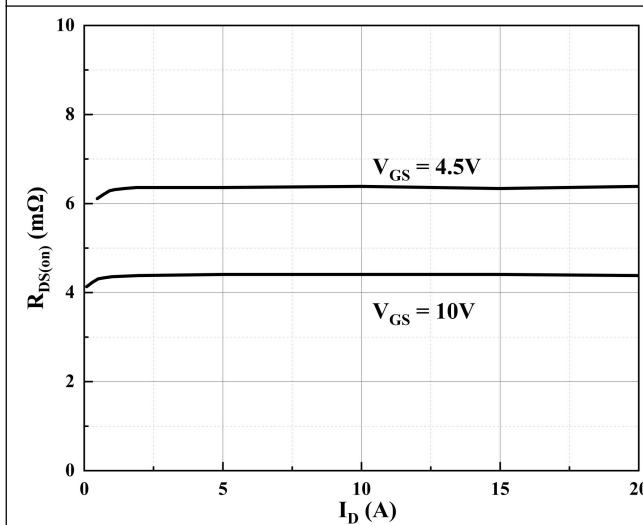


Figure 5. Static Drain-Source On-Resistance vs. Drain Current

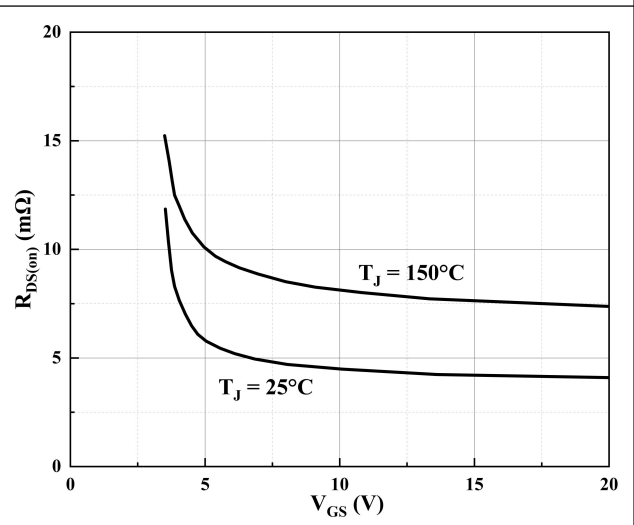


Figure 6. Static Drain-Source On-Resistance vs. Gate-Source Voltage

■ Characteristic Curve

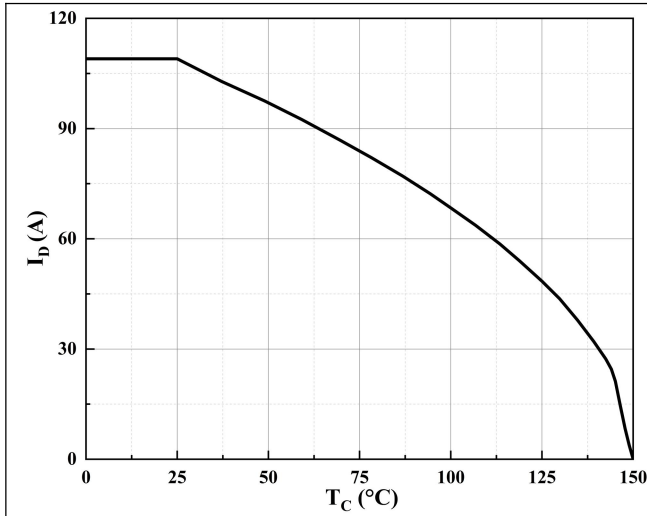


Figure 7. Maximum Continuous Drain Current vs. Case Temperature

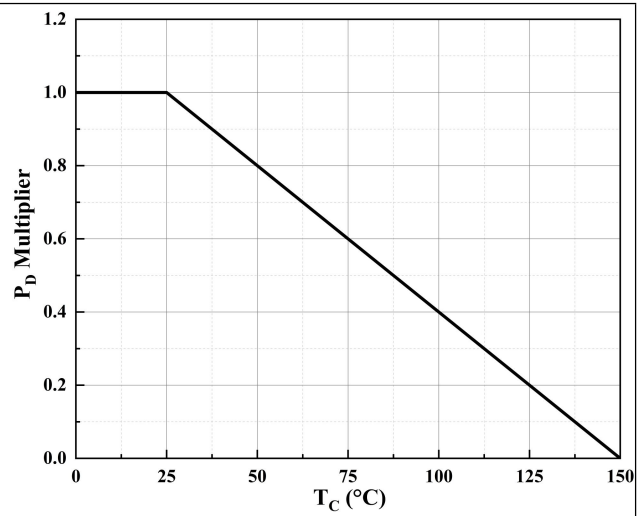


Figure 8. Maximum Power Dissipation Multiplier vs. Case Temperature

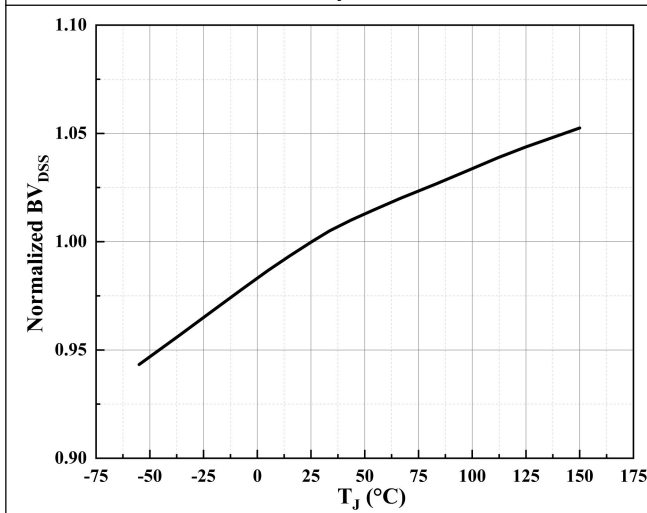


Figure 9. Normalized Drain-Source Breakdown Voltage vs. Junction Temperature

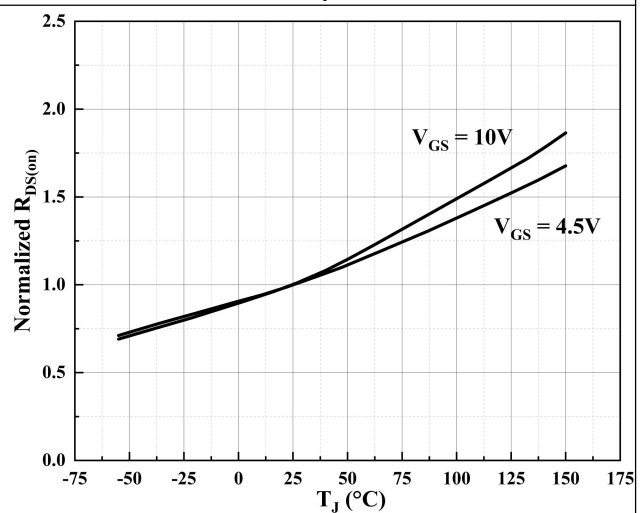


Figure 10. Normalized Static Drain-Source On-Resistance vs. Junction Temperature

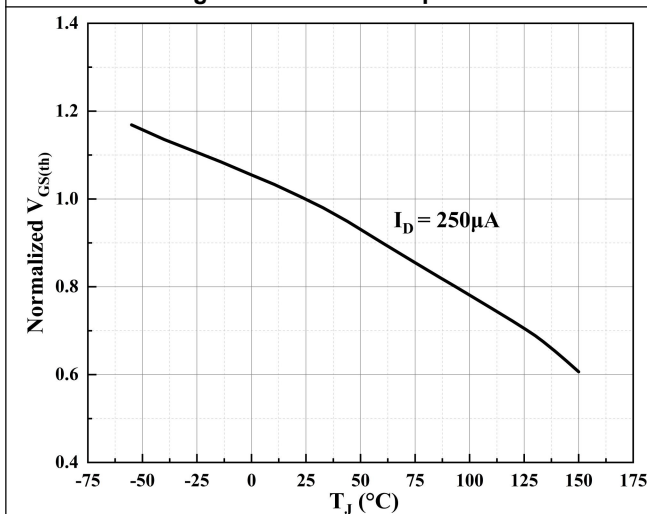


Figure 11. Normalized Threshold Voltage vs. Junction Temperature

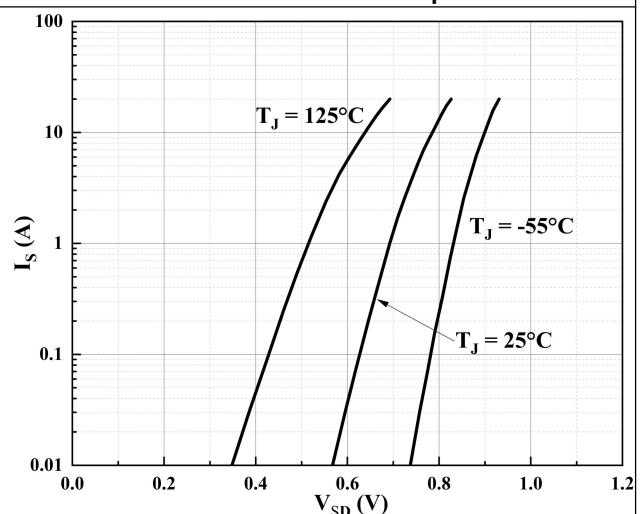
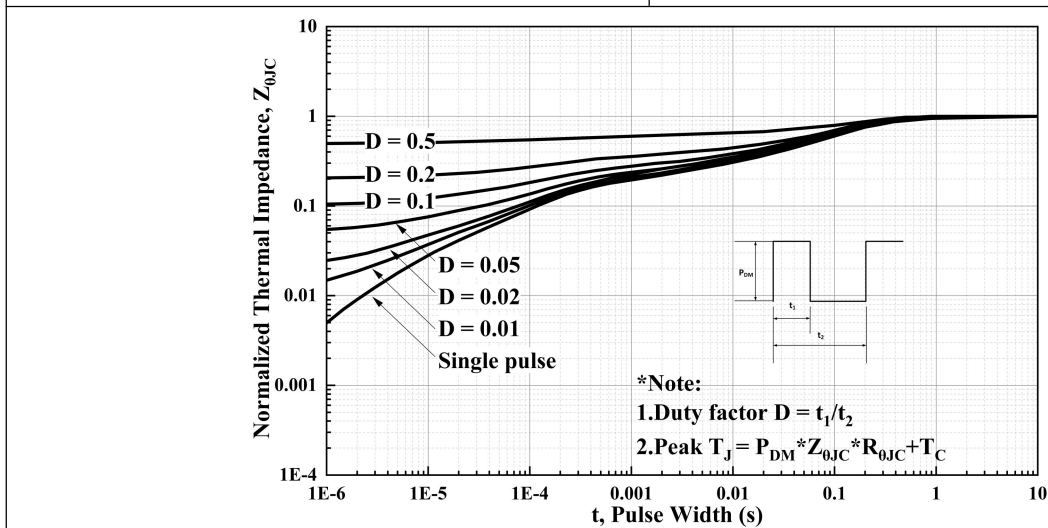
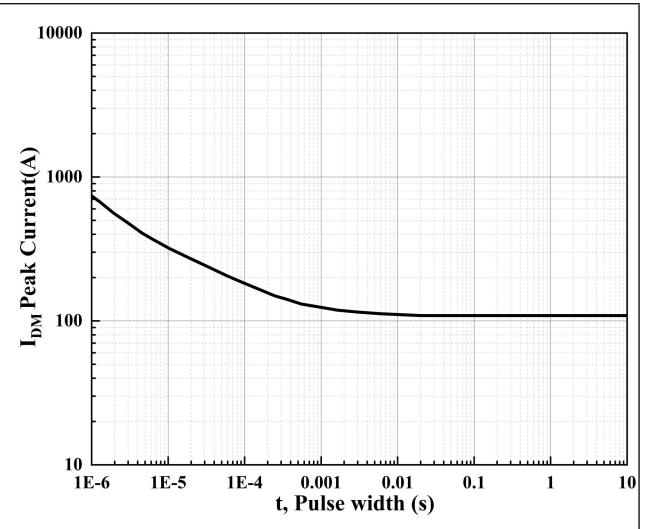
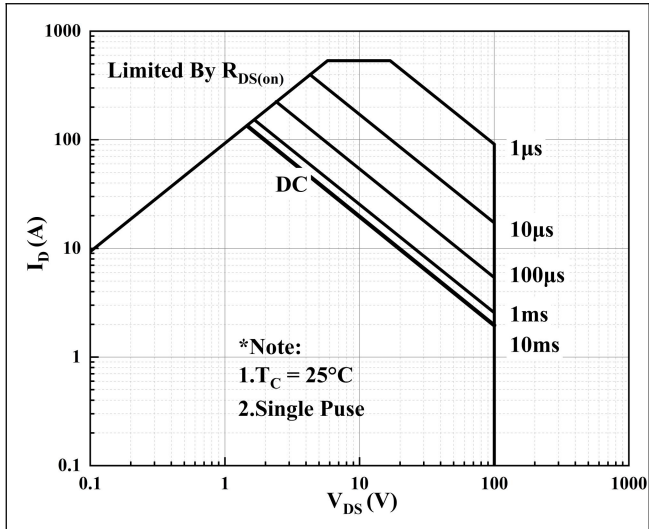


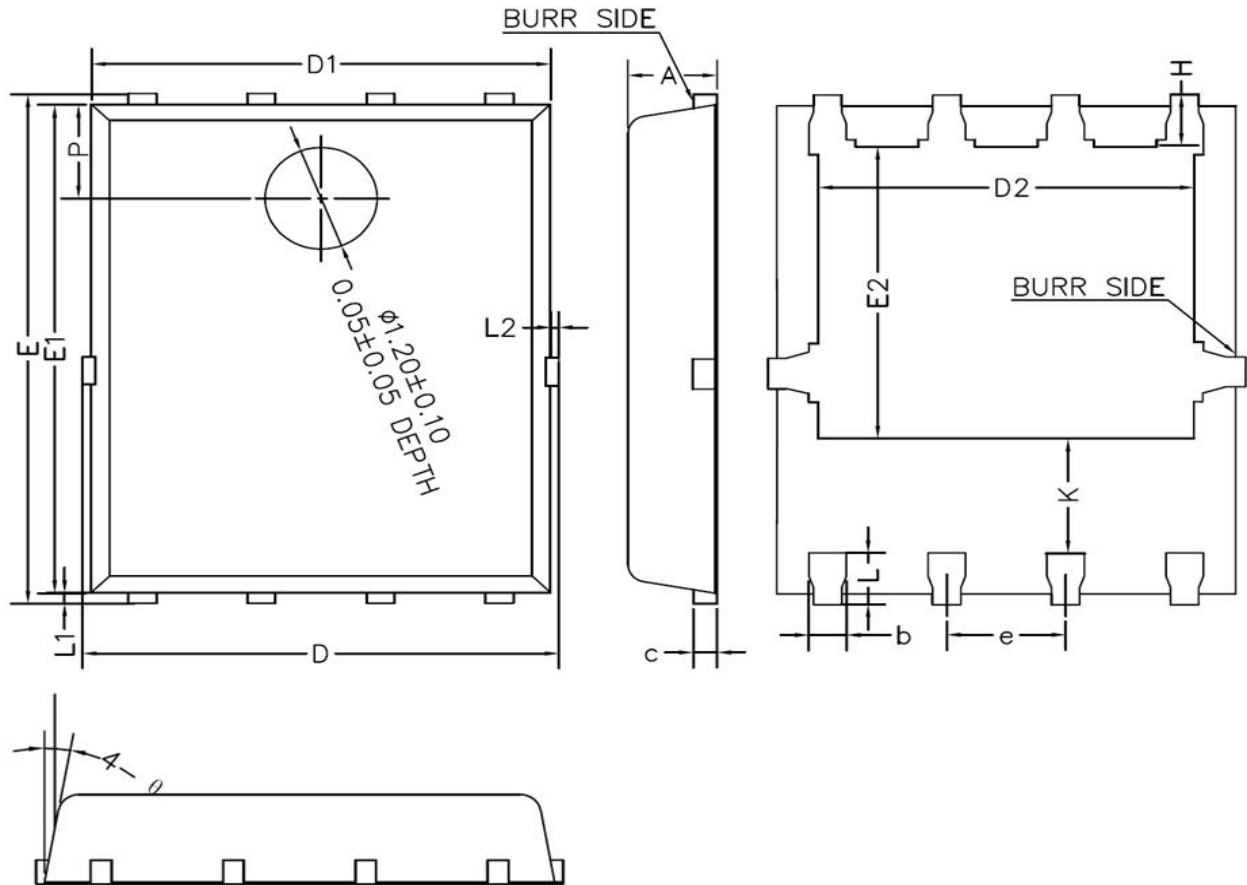
Figure 12. Body Diode Characteristics

■ Characteristic Curve



■ Package Information

PDFN5×6



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	1.00	1.10	1.20
b	0.35	0.40	0.45
c	0.21	0.25	0.34
D	—	—	5.10
D1	4.90	4.95	5.00
D2	3.91	4.01	4.11
e	1.17	1.27	1.37
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.34	3.44	3.54
H	0.51	0.61	0.71
K	1.10	—	—
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
L2	—	—	0.15
P	1.00	1.10	1.20
θ	8°	10°	12°