

■ PRODUCT CHARACTERISTICS

$V_{DSS}$	20V
$R_{DS(ON)}$ Typ(@ $V_{GS}=4.5V$ )	6.3m $\Omega$
$R_{DS(ON)}$ Typ(@ $V_{GS}=2.5V$ )	7.7m $\Omega$
ID	25A

■ APPLICATIONS

- Portable Equipment and Battery Powered systems.
- Power Management in Notebook Computer

■ FEATURES

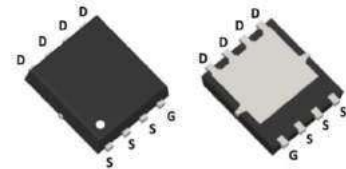
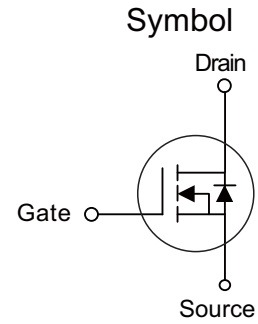
- Lower  $R_{DS(ON)}$  to Minimize Conduction Losses
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-free	Halogen		
N/A	MOT2176J	PDFN3X3-8L	5000 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS ( $T_J=25^\circ C$  Unless Otherwise Noted)

PARAMETER	SYMBOL	RATINGS	UNIT	
Drain-Source Voltage	$V_{DSS}$	20	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	V	
Drain Current	$T_C=25^\circ C$	$I_D$	25	A
	$T_C=100^\circ C$	$I_D$	16	A
Plused Drain Current	$I_{DM}$	100	A	
Avalanche Energy	$E_{AS}$	49	mJ	
Power Dissipation	$P_D$	13	W	
Junction Temperature	$T_J$	+150	$^\circ C$	
Storage Temperature Range	$T_{STG}$	-55 ~ +150	$^\circ C$	



PDFN3X3-8L

**■ ELECTRICAL CHARACTERISTICS (T =25°C unless otherwise specified)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4		1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=15A$	-	6.3	7.2	m $\Omega$
		$V_{GS}=2.5V, I_D=15A$	-	7.7	8.5	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=25A$	10	-	-	S
Dynamic characteristics						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$	-	1567	-	PF
Output Capacitance	$C_{oss}$		-	281	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	239	-	PF
Switching characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=5A$ $V_{GS}=4.5V, R_G=3\Omega$	-	13	-	nS
Turn-on Rise Time	$t_r$		-	45	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	49	-	nS
Turn-Off Fall Time	$t_f$		-	59	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=10V, I_D=5A,$ $V_{GS}=4.5V$	-	19	-	nC
Gate-Source Charge	$Q_{gs}$		-	3	-	nC
Gate-Drain Charge	$Q_{gd}$		-	5.5	-	nC
Drain-source diode characteristics						
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=25A$	-	-	1.2	V
Diode Forward Current	$I_S$		-	-	25	A
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ C, I_F = 5A$ $di/dt = 100A/\mu s$	-	25	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	6	-	nC

■ TYPICAL CHARACTERISTICS

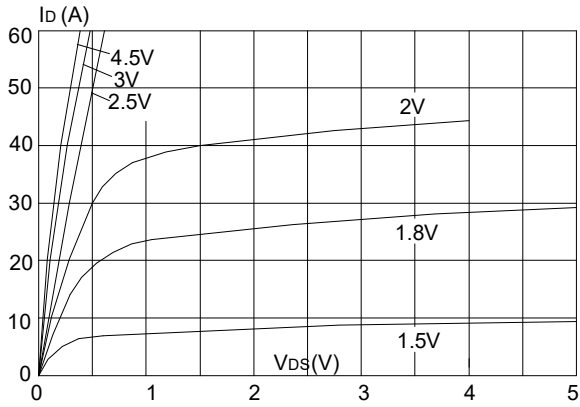


Figure 3: Output Characteristics

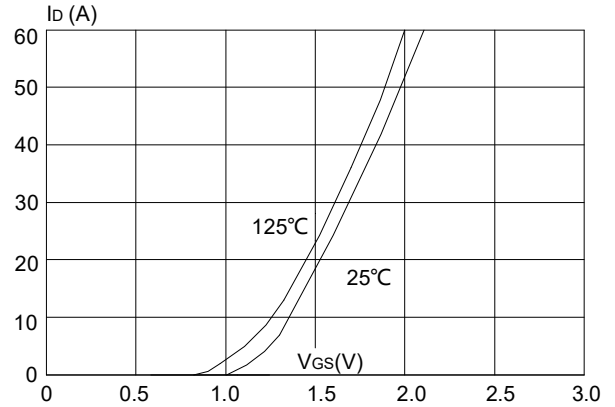


Figure 4: Typical Transfer Characteristics

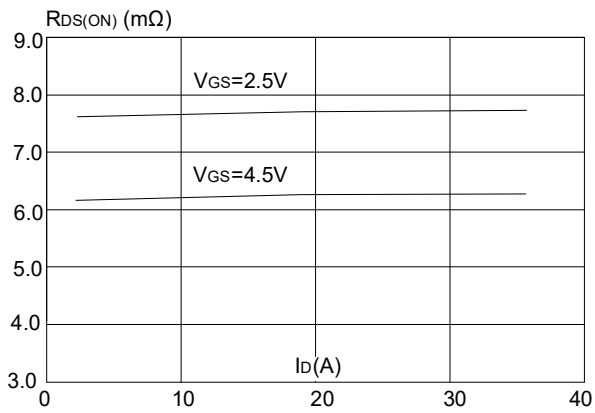


Figure 3: On-resistance vs. Drain Current

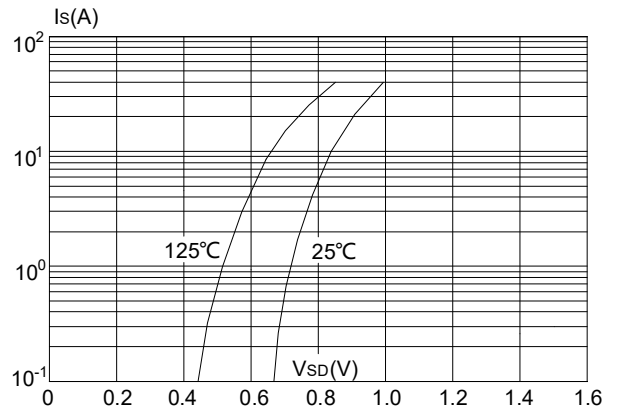


Figure 4: Body Diode Characteristics

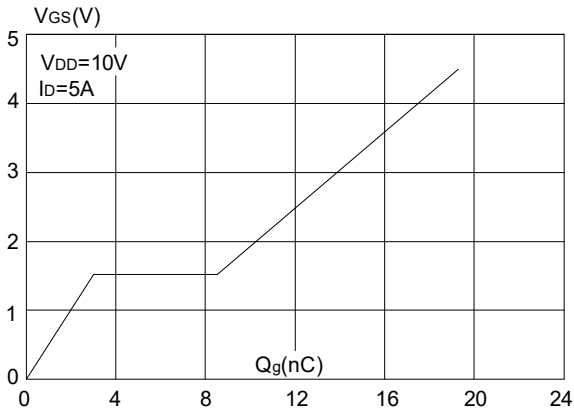


Figure 5: Gate Charge Characteristics

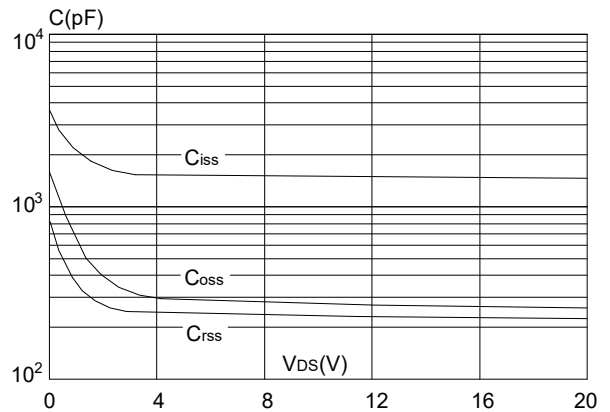


Figure 6: Capacitance Characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

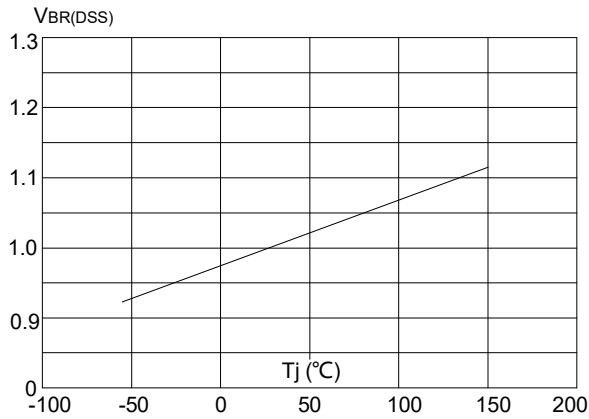


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

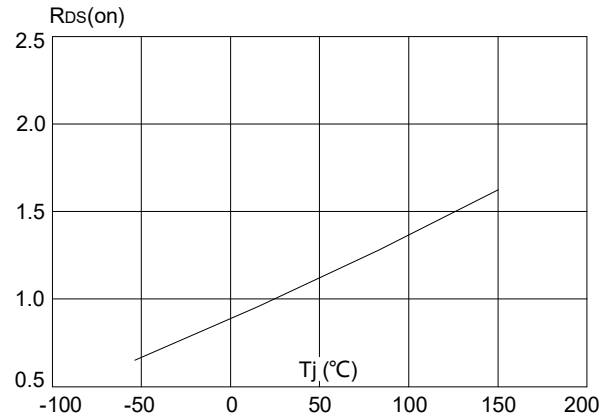


Figure 8: Normalized on Resistance vs. Junction Temperature

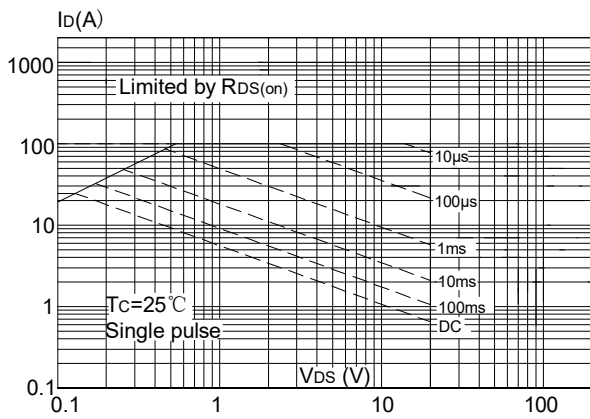


Figure 7: Maximum Safe Operating Area

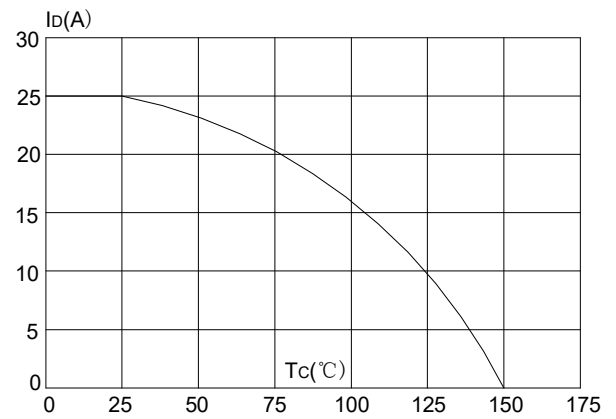


Figure 8: Maximum Continuous Drain Current vs. Case Temperature

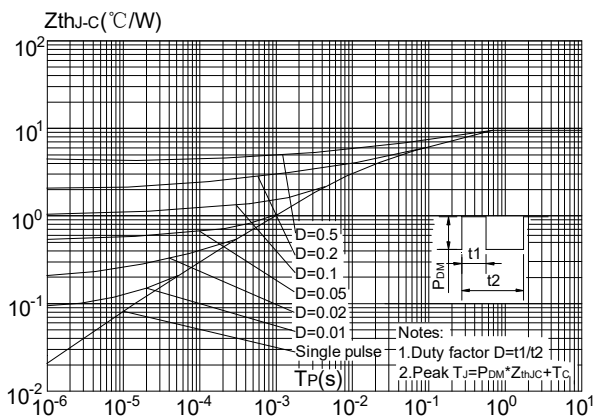
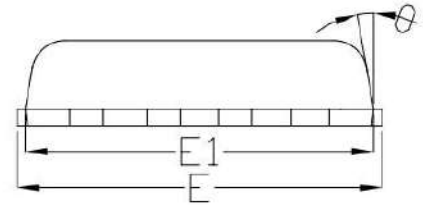
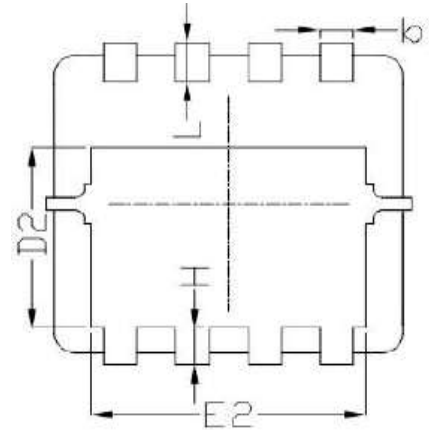
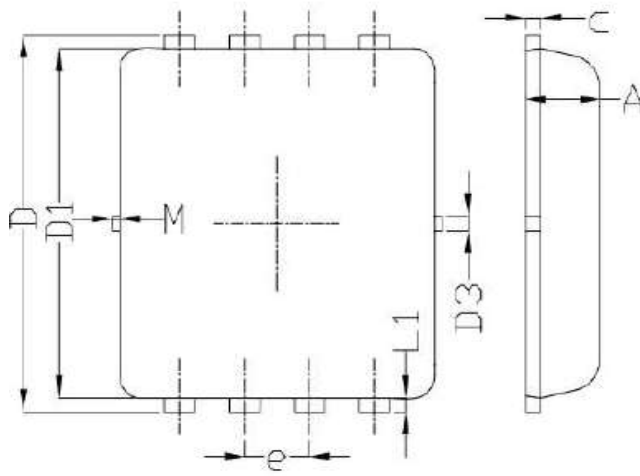
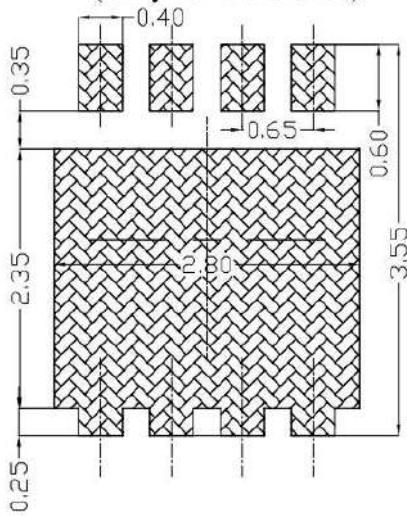


Figure 7: Maximum Effective Transient Thermal Impedance, Junction-to-Case

■ PDFN3X3-8L Package Mechanical Data



Land Pattern  
(Only for Reference)



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
$\theta$	---	10°	12°
M	*	*	0.15
* Not specified			

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