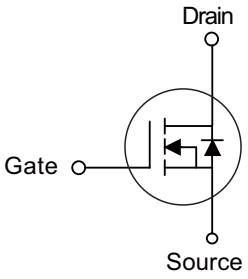
■ PRODUCT CHARACTERISTICS

VDSS	40V
R_{DS}(on)Typ(@V_{GS}=4.5 V)	10mΩ
R_{DS}(on)Typ(@V_{GS}=10 V)	6mΩ
ID	45A

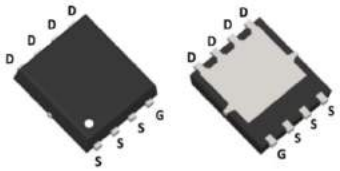
Symbol



■ APPLICATIONS

- DC/DC Converter

PDFN3X3-8L



■ FEATURES

- Very low on-resistance $R_{DS(on)}$
- Pb-free lead plating

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4170J	PDFN3X3	5000 pieces /Reel

■ ABSOLUTE MAXINMUM RATINGS (T_A=25°C, unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous（Silicon Limited）	I_D	45	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	31.8	A
Pulsed Drain Current（Package Limited）	I_{DM}	180	A
Maximum Power Dissipation	P_D	28	W
Derating factor		0.22	W/℃
Single pulse avalanche energy	E_{AS}	115	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

■ THERMAL DATA

Parameter	Symbol	Limit	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	4.5	℃/W

■ Electrical Characteristics (T_C=25℃ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off charameteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On charameteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.0	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	6	7.2	mΩ
		V_{GS}=4.5V, I_D=20A	-	10	12	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	-	30	-	S
Dynamic charameteristics						
Input Capacitance	C_{lss}	V_{DS}=20V,V_{GS}=0V, F=1.0MHz	-	831	-	PF
Output Capacitance	C_{oss}		-	318	-	PF
Reverse Transfer Capacitance	C_{rss}		-	24	-	PF
Switching charameteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=20V,I_D=20A V_{GS}=10V,R_G=1.6Ω	-	6	-	nS
Turn-on Rise Time	t_r		-	2.8	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	23	-	nS
Turn-Off Fall Time	t_f		-	3	-	nS
Total Gate Charge	Q_g	V_{DS}=20V,I_D=20A, V_{GS}=10V	-	17.6	-	nC
Gate-Source Charge	Q_{gs}		-	3.5	-	nC
Gate-Drain Charge	Q_{gd}		-	3.1	-	nC
Drain-source diode charameteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=20A	-	-	1.2	V
Diode Forward Current	I_S		-	-	45	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = I_S di/dt = 100A/μs	-	11	-	nS
Reverse Recovery Charge	Qrr		-	19	-	nC

■ TYPICAL CHARACTERISTICS

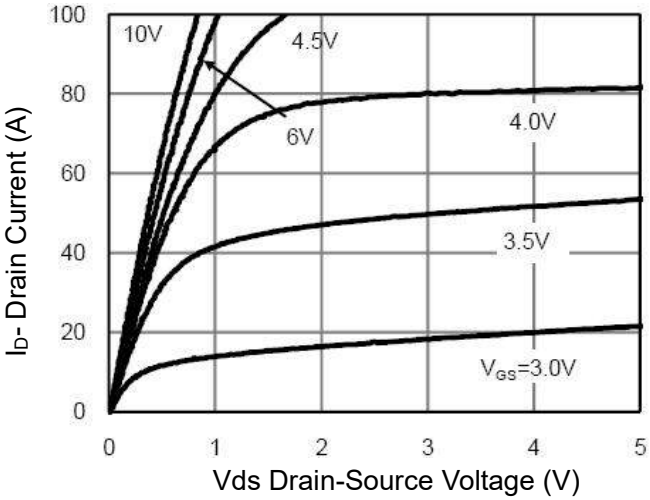


Figure 1 Output Characteristics

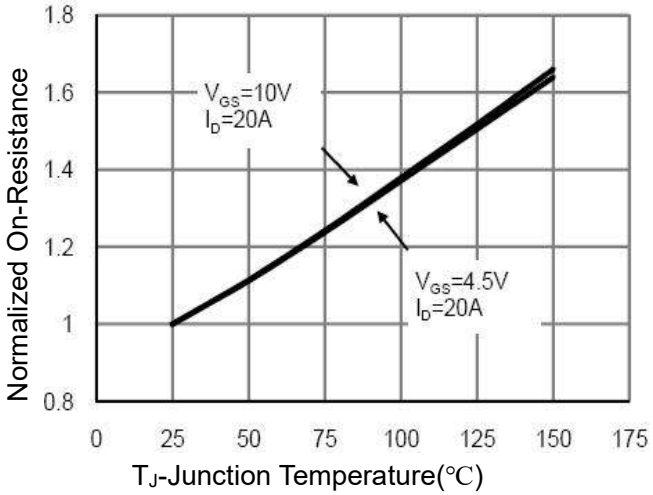


Figure 2 Rdson-Junction Temperature

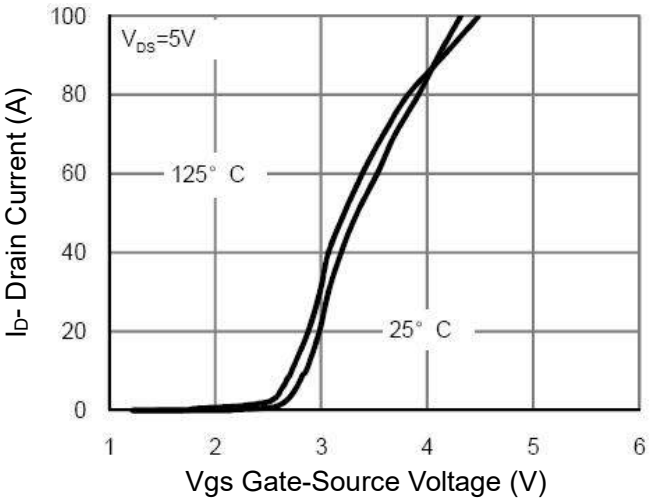


Figure 3 Transfer Characteristics

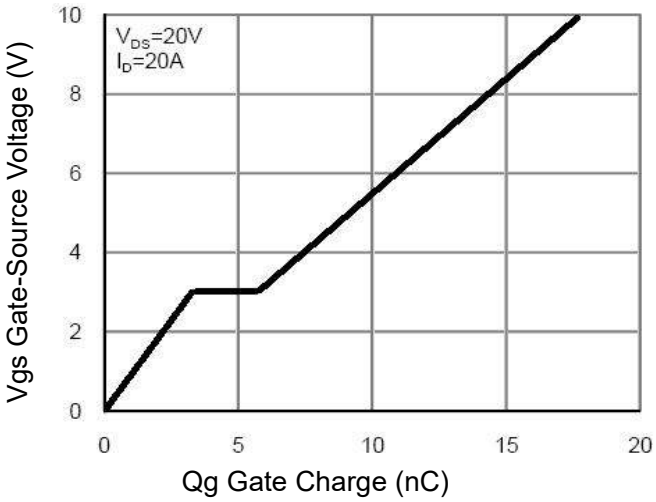


Figure 4 Gate Charge

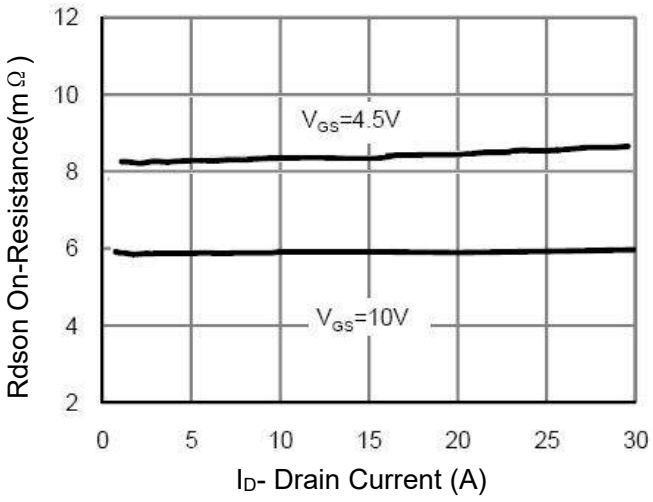


Figure 5 Rdson- Drain Current

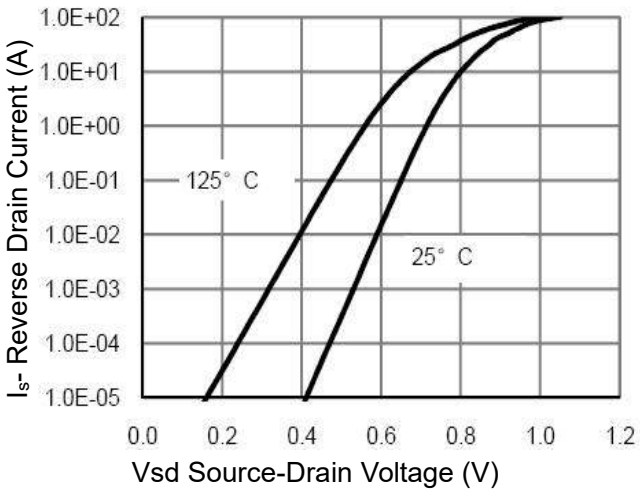


Figure 6 Source- Drain Diode Forward

■ TYPICAL CHARACTERISTICS(Cont.)

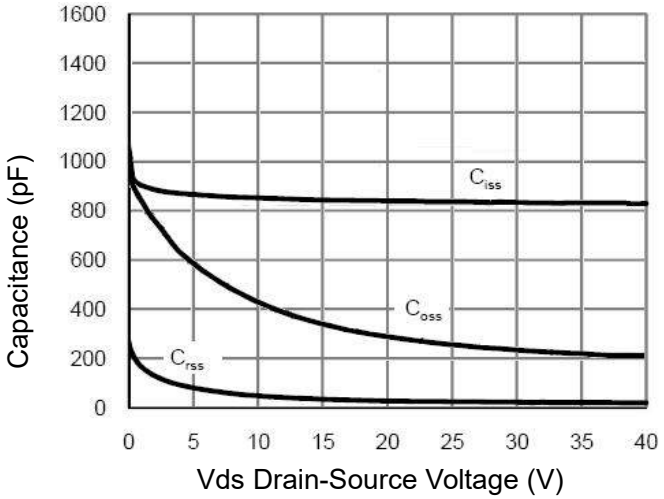


Figure 7 Capacitance vs Vds

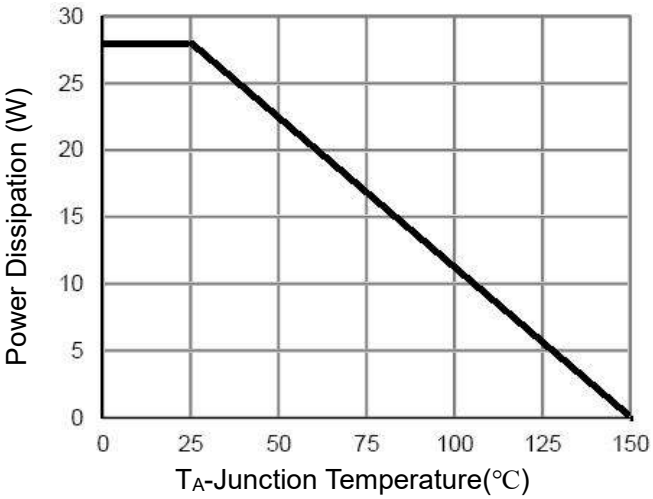


Figure 8 Power De-rating

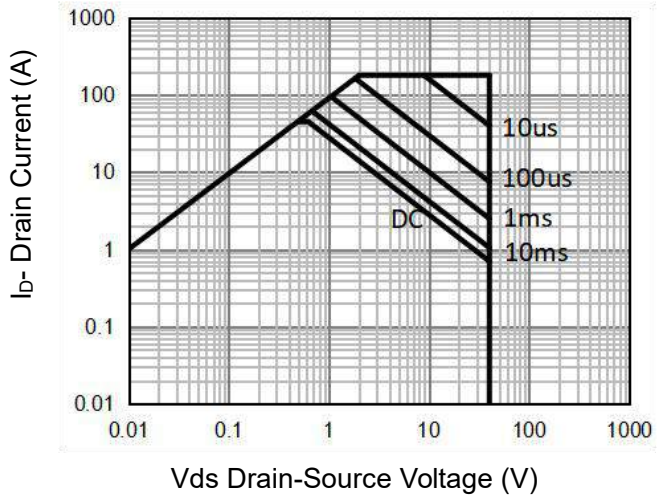


Figure 9 Safe Operation Area (Note 3)

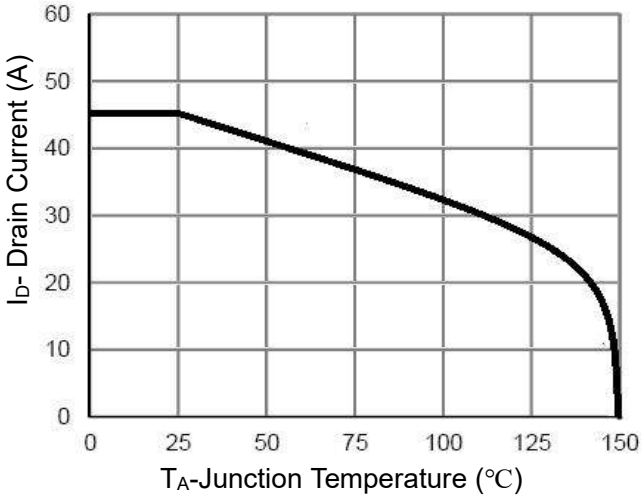


Figure 10 Current De-rating

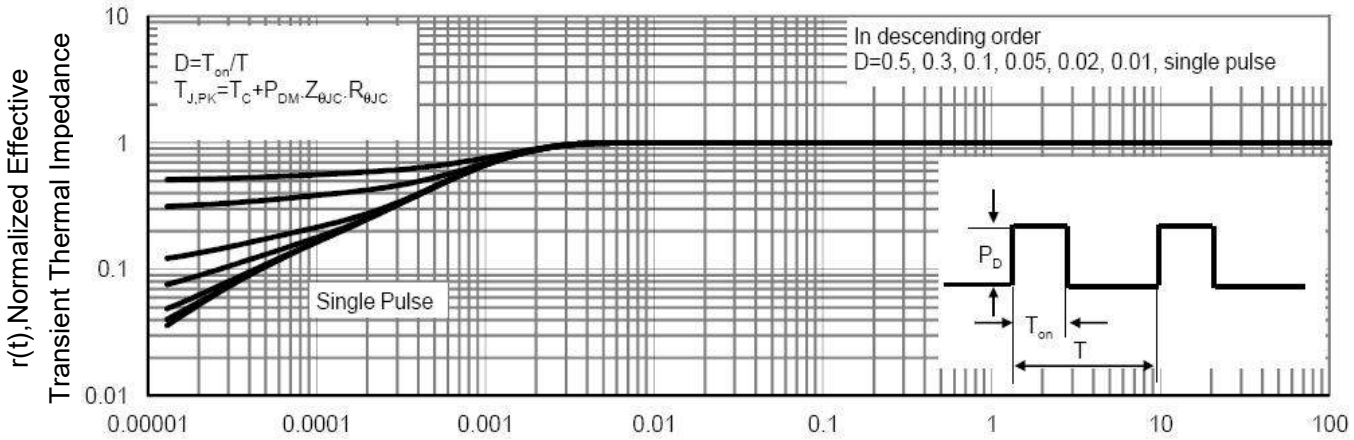
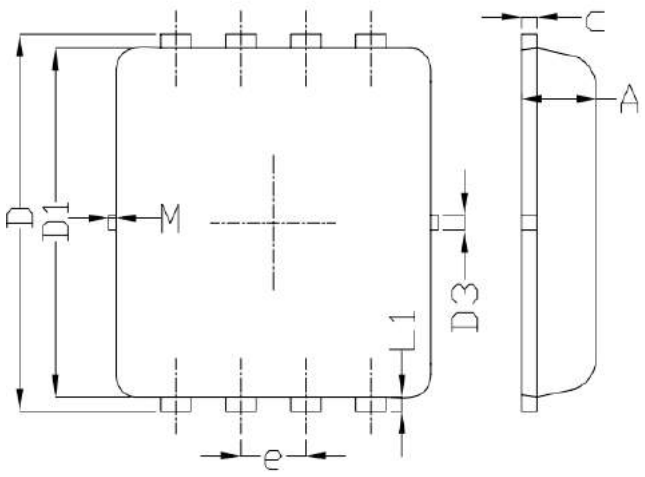
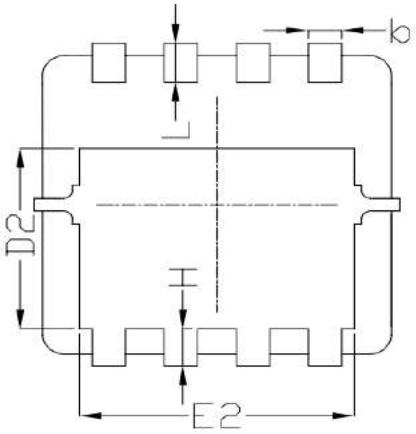
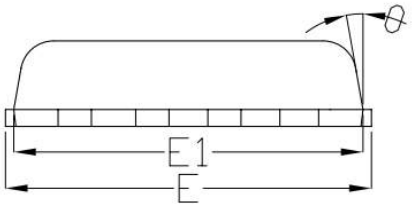


Figure 11 Normalized Maximum Transient Thermal Impedance

■ PDFN3X3-8L Package Mechanical Data







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	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			

Land Pattern
(Only for Reference)