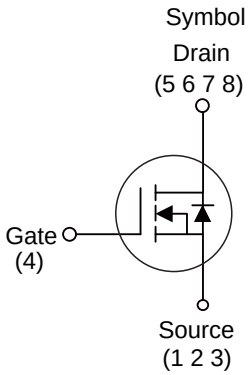
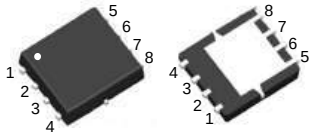
■ PRODUCT CHARACTERISTICS

V_{DSS}	20V
$R_{DS(ON)}$Typ(@V_{GS}=4.5V)	5.6mΩ
$R_{DS(ON)}$Typ(@V_{GS}=2.5V)	6.8mΩ
I_D	60A



■ APPLICATIONS

* Electronic lamp ballasts based on half bridge
* Load Switching,Quick/Wirelss Charge.
* Motor Driving



PDFN3X3

■ FEATURE

* Low Gate Charge
* Pb-Free Lead Plating

■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT2176J	PDFN3X3	5000 pieces/Reel

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±12	V
Drain Current Continuous(@V_{GS}=4.5V ,T_A=25°C)	I_D	60	A
Drain Current Continuous(@V_{GS}=4.5V ,T_A=100°C)	I_D	42	A
Drain Current Pulsed	I_{DM}	240	A
Avalanche Energy *	E_{AS}	95	mJ
Power Dissipation	P_D	40	W
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-55~ +150	°C

■ THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	3.13	°C/W

Note: * EAS condition: T_J=25°C ,V_{DD}=12V,V_G=10V ,L=0.5mH,R_g=25Ω

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=250μA	20	-	-	V
Drain to Source Leakage Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V	-	-	1	μA
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+12V ,V_{DS}=0V	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-12V ,V_{DS}=0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V,I_D=10 A	-	5.6	7	mΩ
		V_{GS}=2.5V,I_D=10 A	-	6.8	7.8	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	0.3	0.62	1.1	V
Dynamic characteristics						
Gate capacitance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	1.6	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=10V,I_D=3A	-	11	-	S
Input Capacitance	C_{iss}	V_{DS}=12V,V_{GS}=0V f=1.0MHz	-	1200	-	pF
Output Capacitance	C_{oss}		-	152	-	pF
Reverse Transfer Capacitance	C_{rss}		-	148	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	V_{GS}=4.5V,V_{DS}=10V, I_D=20 A ,R_G=3Ω	-	6.4	-	ns
Rise Time	t_r		-	17.2	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	29.6	-	ns
Fall Time	t_f		-	16.8	-	ns
Total Gate Charge	Q_g	I_D=20 A, V_{DS}=10V V_{GS}=4.5V	-	35	-	nC
Gate to Source Charge	Q_{gs}		-	3	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	10	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	60	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	240	A
Diode Forward Voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V	-	0.72	1.2	V
Reverse Recovery Time	t_{rr}	I_{SD}=20 A, T_J=25 °C dI/dt=100A/μs	-	25	-	ns
Reverse Recovery Charge	Q_{rr}		-	24	-	nC

■ TYPICAL CHARACTERISTICS

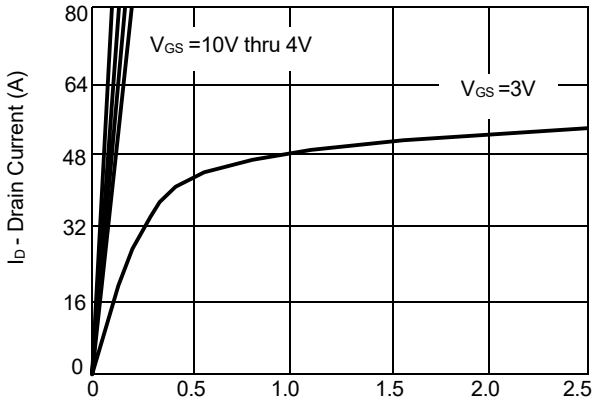


Figure 1: Output characteristics

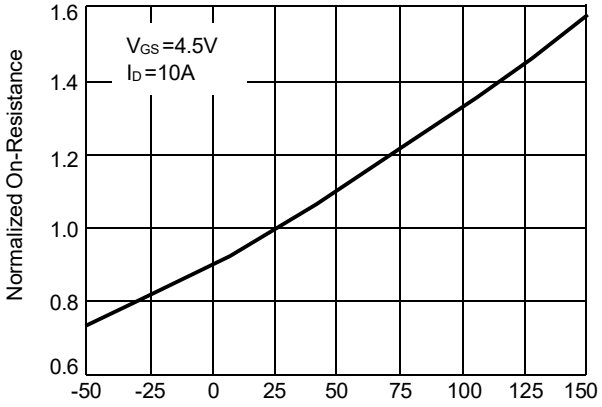


Figure 2: Rdson-junction temperature

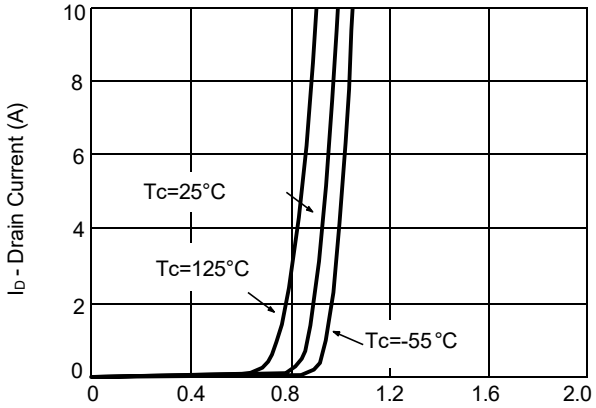


Figure 3: Transfer characteristics

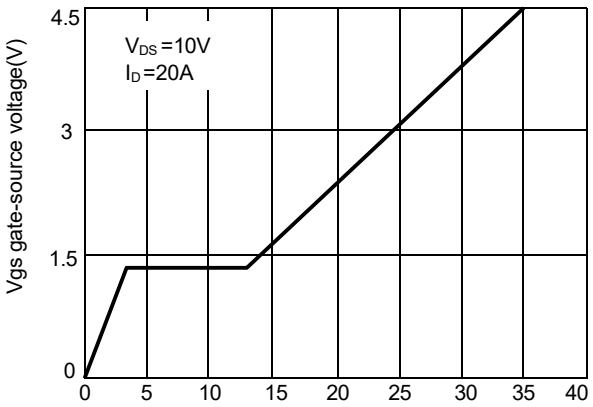


Figure 4: Gate charge

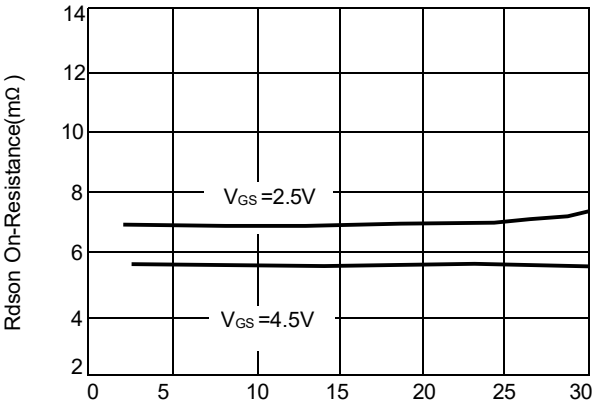


Figure 5: Rdson-drain current

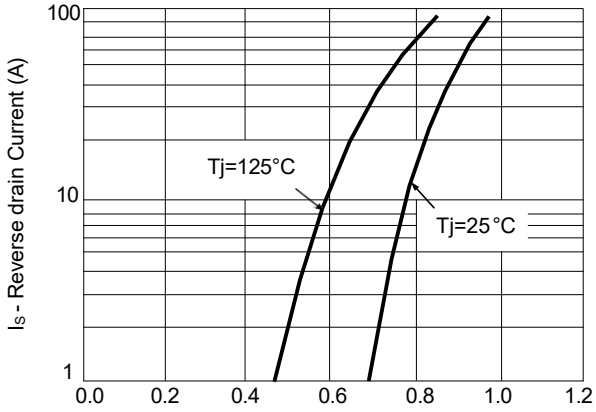


Figure 6: Source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

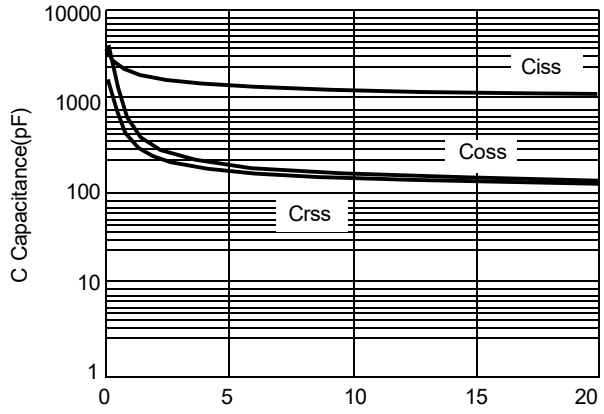


Figure 7: Capatitance de-rating

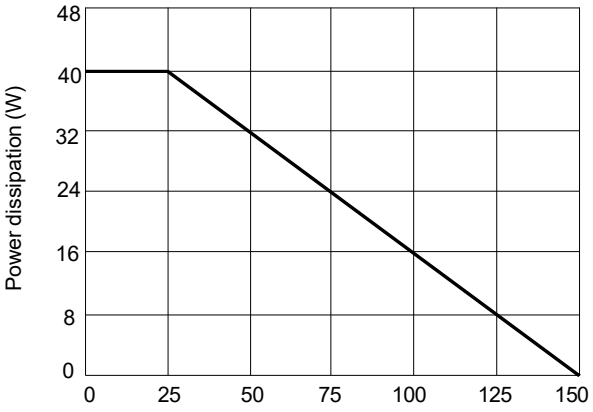


Figure 8: Power de-rating

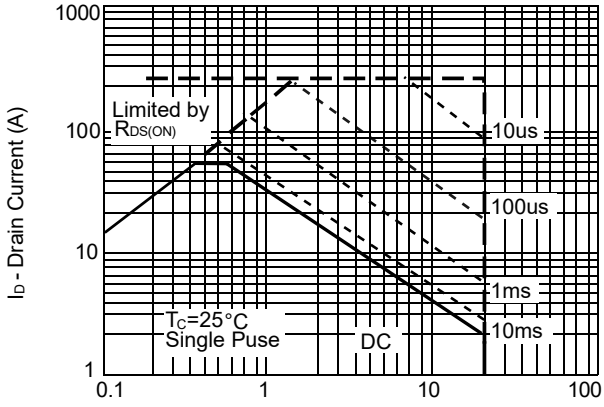


Figure 9: Safe operation area

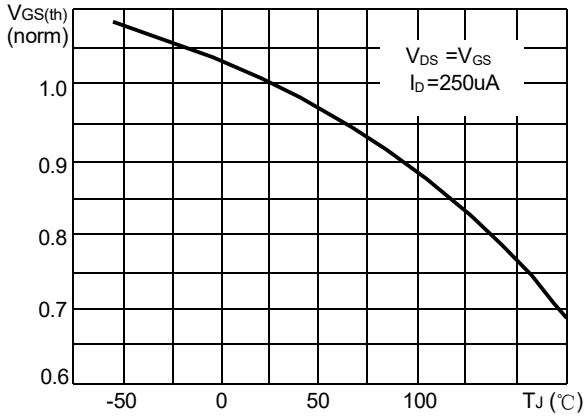
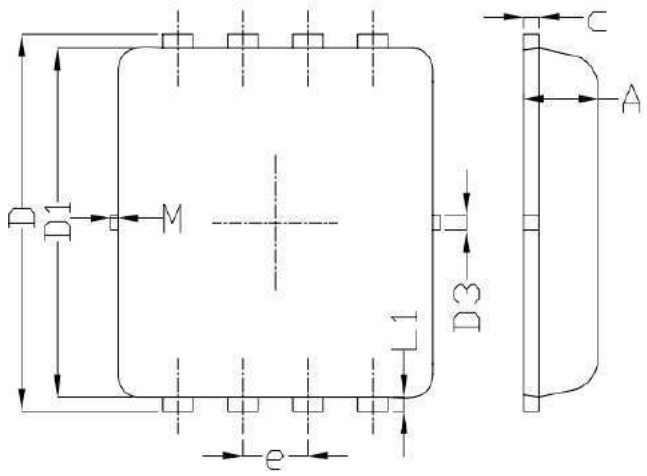
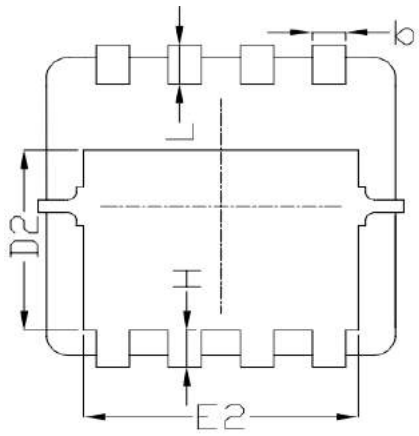
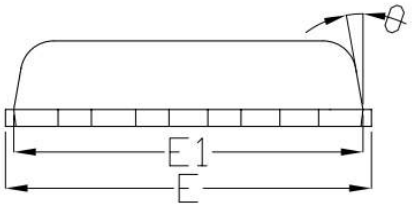


Figure 10: $V_{GS(th)}$ vs junction temperature

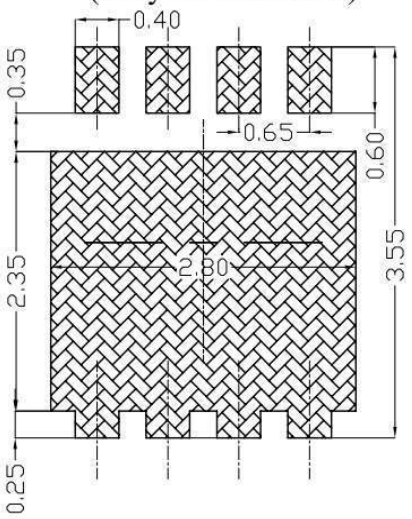
■ PDFN3X3 PACKAGE OUTLINE DIMENSIONS







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