

■ PRODUCT CHARACTERISTICS

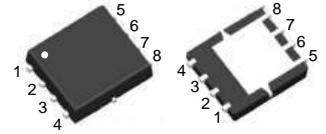
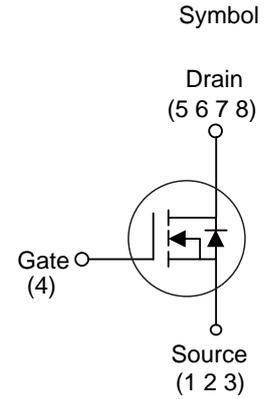
$V_{DSS}$	30V
$R_{DS(ON) Typ} (@V_{GS}=10V)$	3.5m $\Omega$
$R_{DS(ON) Typ} (@V_{GS}=4.5V)$	6.5m $\Omega$
$I_D$	120A

■ APPLICATIONS

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

■ FEATURE

- \* Low Gate Charge
- \* Pb-Free Lead Plating



PDFN3X3

■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT3136AJ	PDFN3X3	5000 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}C$ , unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current Continuous (@ $V_{GS}=10V, T_A=25^{\circ}C$ )	$I_D$	120	A
Drain Current Continuous (@ $V_{GS}=10V, T_A=100^{\circ}C$ )	$I_D$	84	A
Drain Current Pulsed	$I_{DM}$	480	A
Avalanche Energy *	$E_{AS}$	306	mJ
Power Dissipation	$P_D$	93	W
Junction Temperature	$T_J$	+150	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55~ +150	$^{\circ}C$

■ THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	$R_{thJC}$	1.34	$^{\circ}C/W$

Note: \* EAS condition:  $T_J=25^{\circ}C, V_{DD}=24V, V_G=10V, L=0.5mH, R_g=25\Omega$

**■ ELECTRICAL CHARACTERISTICS** ( $T_C=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	$V_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Drain to Source Leakage Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$	-	-	1	$\mu A$
Gate to Source Forward Leakage	$I_{GSS(F)}$	$V_{GS}=+20V, V_{DS}=0V$	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	$V_{GS}=-20V, V_{DS}=0V$	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	3.5	4	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	-	6.5	7.5	m $\Omega$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8	1.45	2.5	V
Dynamic characteristics						
Gate capacitance	$R_g$	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$	-	2.1	-	$\Omega$
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=3A$	-	8	-	S
Input Capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V$ $f=1.0\text{MHz}$	-	2400	-	pF
Output Capacitance	$C_{oss}$		-	290	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	250	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=15V,$ $I_D=20A, R_G=3\Omega$	-	11	-	ns
Rise Time	$t_r$		-	10	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	38	-	ns
Fall Time	$t_f$		-	11	-	ns
Total Gate Charge	$Q_g$	$I_D=20A, V_{DS}=15V$ $V_{GS}=10V$	-	79	-	nC
Gate to Source Charge	$Q_{gs}$		-	9	-	nC
Gate to Drain("Miller") Charge	$Q_{gd}$		-	18	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	$I_S$		-	-	120	A
Maximum Pulsed Current(Body Diode)	$I_{SM}$		-	-	480	A
Diode Forward Voltage	$V_{SD}$	$I_{SD}=1A, V_{GS}=0V$	-	0.71	1.2	V
Reverse Recovery Time	$t_{rr}$	$I_{SD}=20A, T_J=25^{\circ}\text{C}$ $di/dt=100A/\mu s$	-	40	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	30	-	nC

■ TYPICAL CHARACTERISTICS

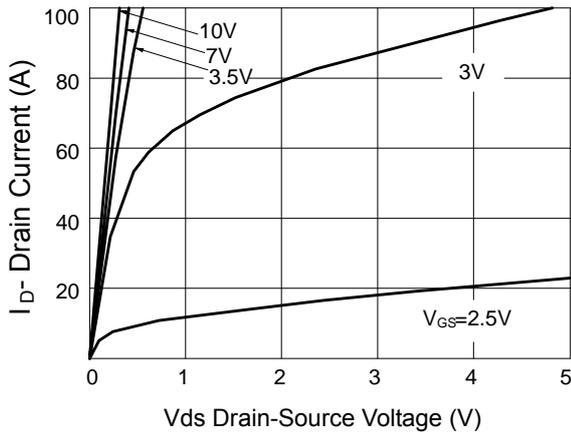


Figure 1: Output characteristics

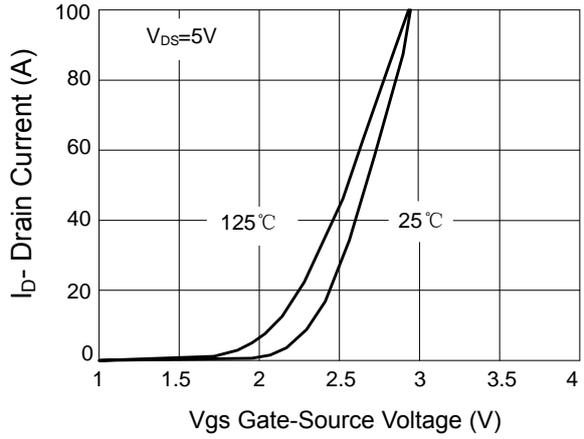


Figure 2: Transfer characteristics

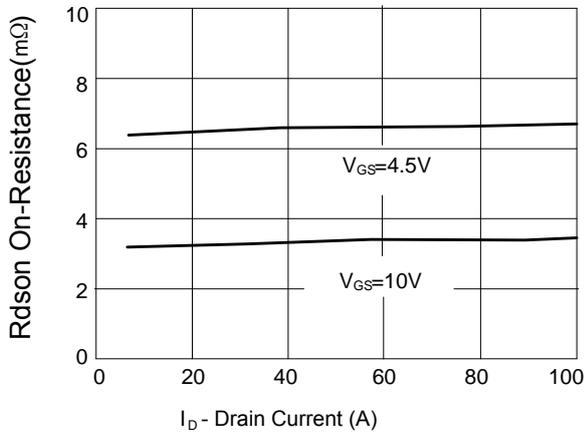


Figure 3:  $R_{DS(on)}$ -drain-current

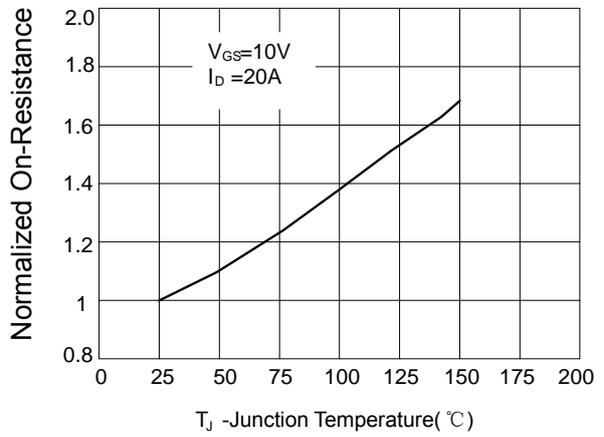


Figure 4:  $R_{DS(on)}$ -junction temperature

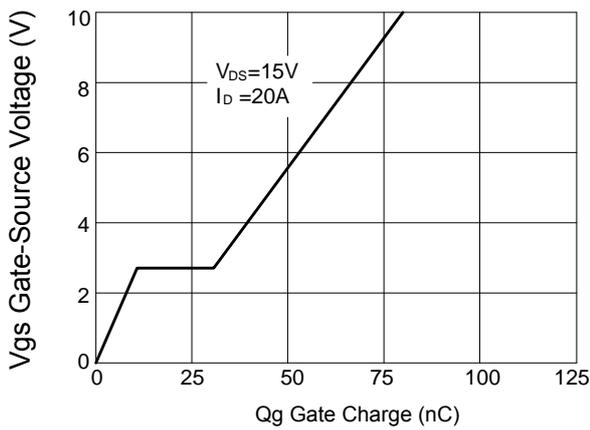


Figure 5: Gate charge

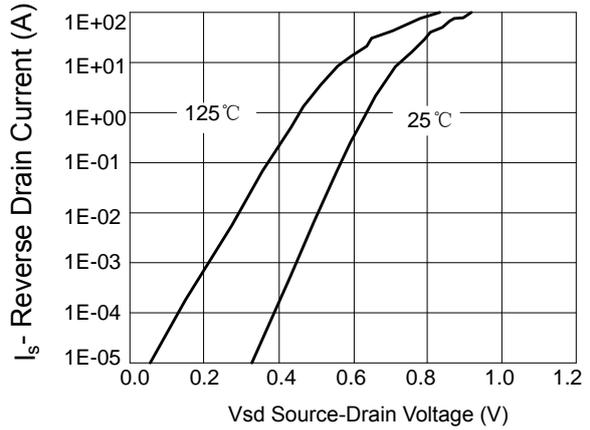


Figure 6: Source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

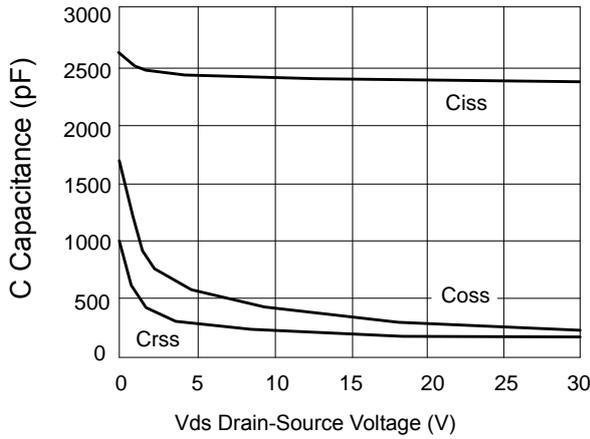


Figure 7: Capacitance vs vds

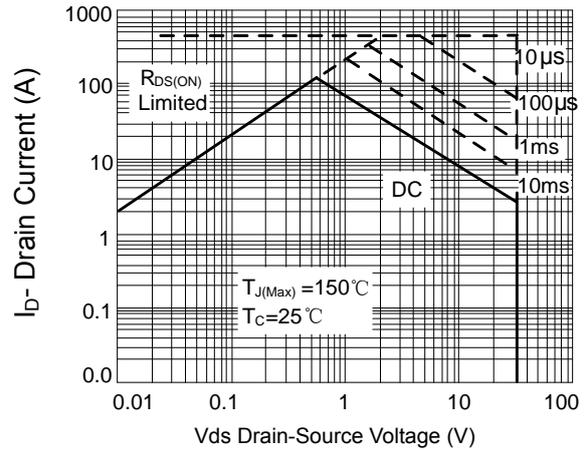


Figure 8: Safe operating area

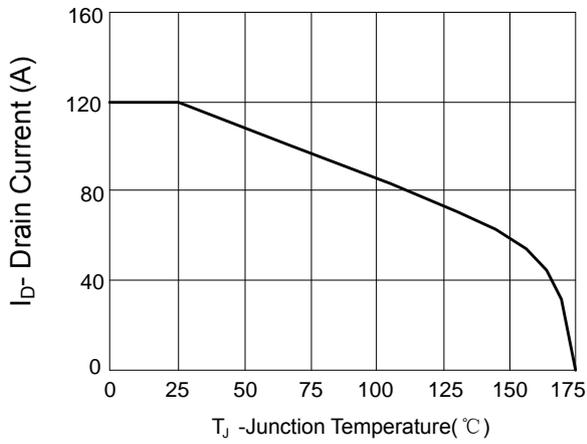


Figure 9: Current de-rating

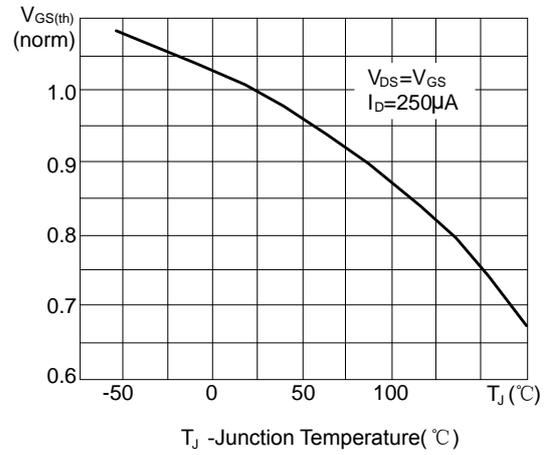
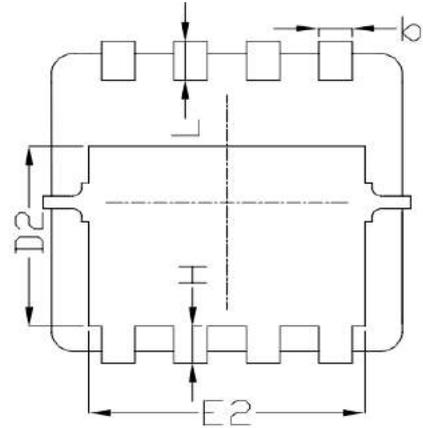
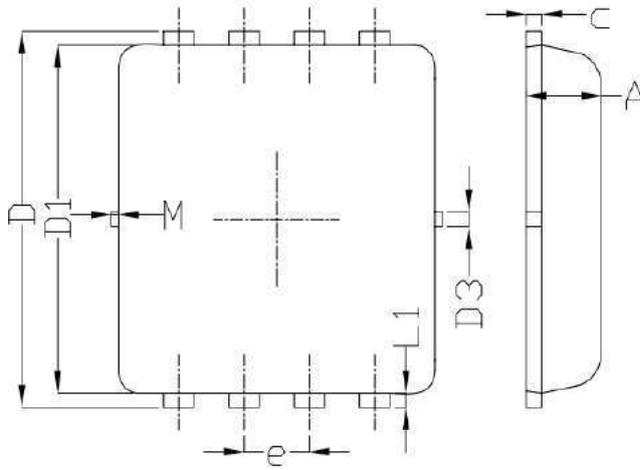
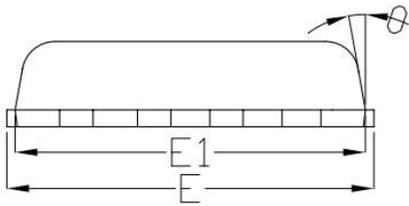


Figure 10:  $V_{GS}$  vs junction temperature

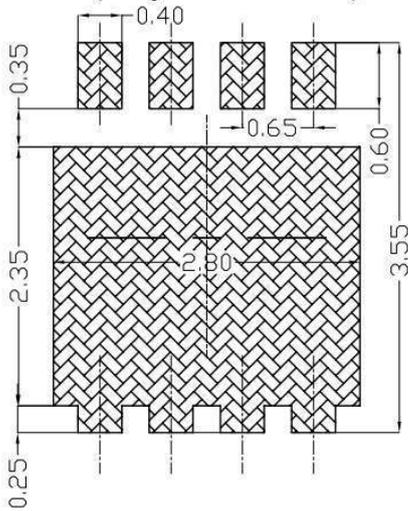
■ PDFN3\*3 PACKAGE OUTLINE DIMENSIONS



50



Land Pattern  
(Only for Reference)



SYMBOL	DIMENSIONAL REQUMTS		
	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			