

PRODUCT CHARACTERISTICS

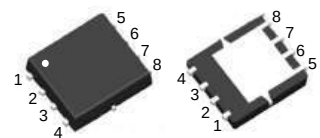
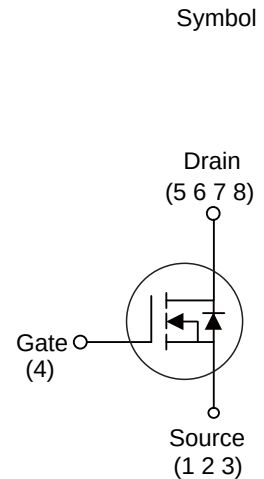
V_{DSS}	40V
$R_{DS(ON)} Typ(@V_{GS}=10V)$	7.8m Ω
$R_{DS(ON)} Typ(@V_{GS}=4.5V)$	11m Ω
I_D	60A

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	MOT4180J	PDFN3X3	5000 pieces/Reel

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	40	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current Continuous($@V_{GS}=10V, T_A=25^{\circ}C$)	I_D	60	A
Drain Current Continuous($@V_{GS}=10V, T_A=100^{\circ}C$)	I_D	44	A
Drain Current Pulsed	I_{DM}	240	A
Avalanche Energy *	E_{AS}	121	mJ
Power Dissipation	P_D	53	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}	2.35	$^{\circ}C/W$

Note: * EAS condition: $T_J=25^{\circ}C, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25\Omega$

■ 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 =250μA	40	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =40V,V _{GS} =0V	-	-	1	μA
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 =20 A	-	7.8	8.5	mΩ
		V _{GS} =4.5V,I _D =15 A	-	11	13	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	1	1.65	2.5	V
Dynamic characteristics						
Gate capacitance	R _g	V _{GS} =0V,V _{DS} =0V ,f=1.0MHz	-	2.0	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =5V,I _D =5A	-	12	-	S
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V f=1.0MHz	-	1700	-	pF
Output Capacitance	C _{oss}		-	154	-	pF
Reverse Transfer Capacitance	C _{rss}		-	115	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =10V, V _{DS} =20V, 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} =20V V _{GS} =10V	-	29	-	nC
Gate to Source Charge	Q _{gs}		-	4.5	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	6.4	-	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	-	0.73	1.2	V
Reverse Recovery Time	t _{rr}	I _{SD} =20 A, T _J =25 °C dI/dt=100A/μs	-	29	-	ns
Reverse Recovery Charge	Q _{rr}		-	26	-	nC

■ TYPICAL CHARACTERISTICS

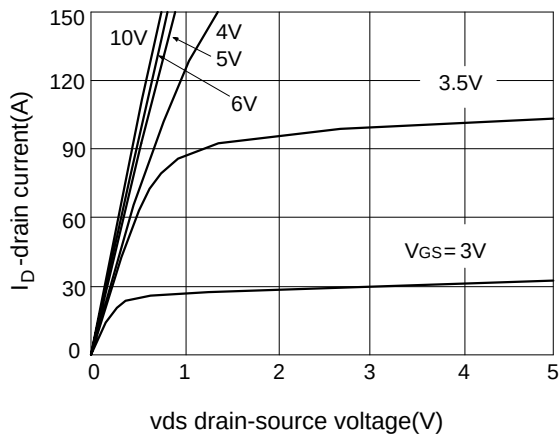


Fig.1 output characteristics

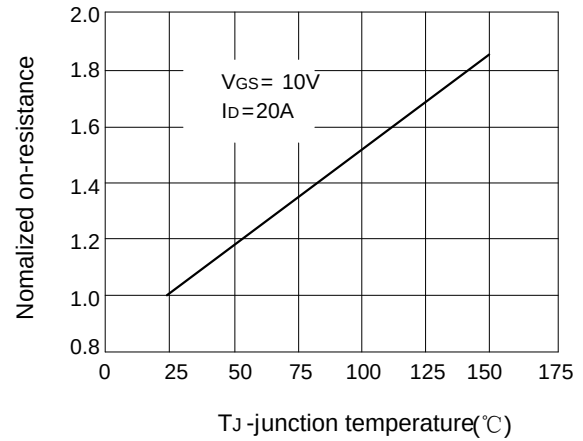


Fig.2 rdson-junction temperature

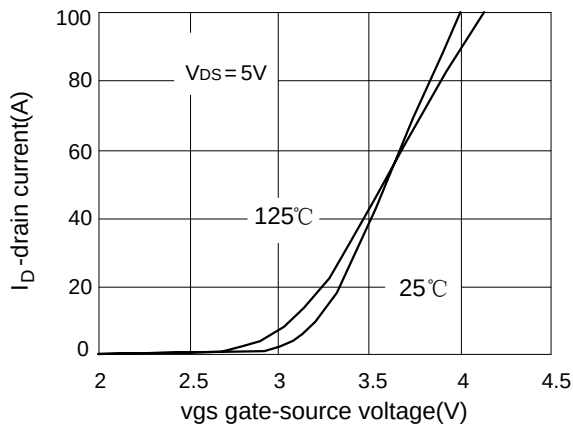


Fig.3 transfer characteristics

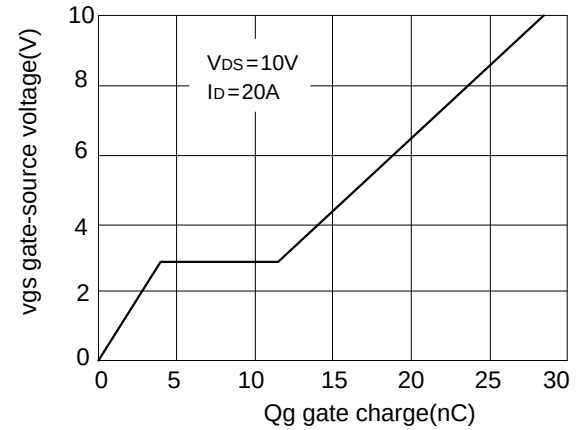


Fig.4 gate charge

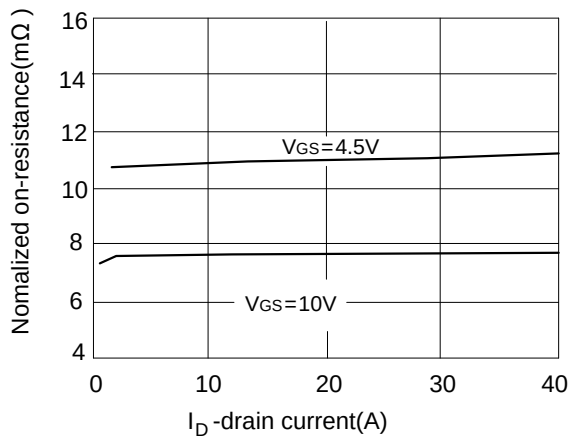


Fig.5 rdson-drain current

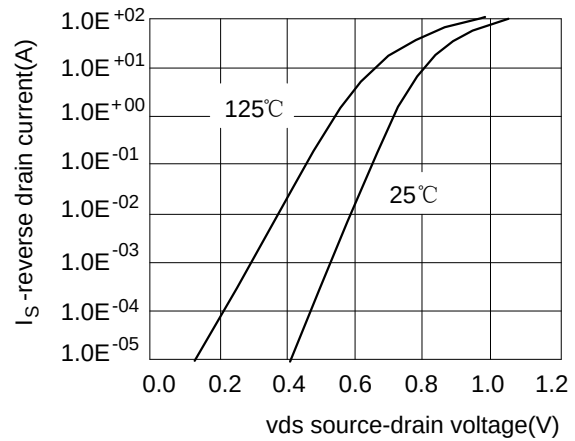


Fig.6 source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

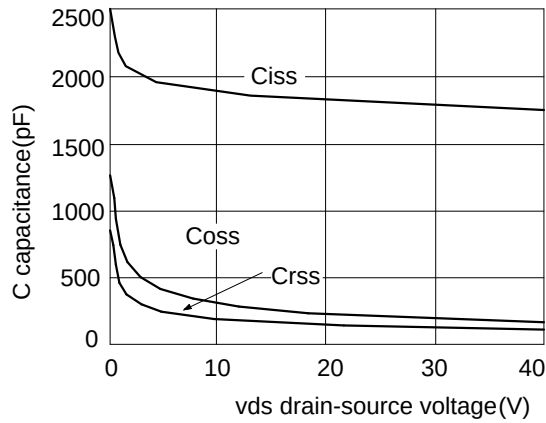


Fig.7 capacitance vs vds

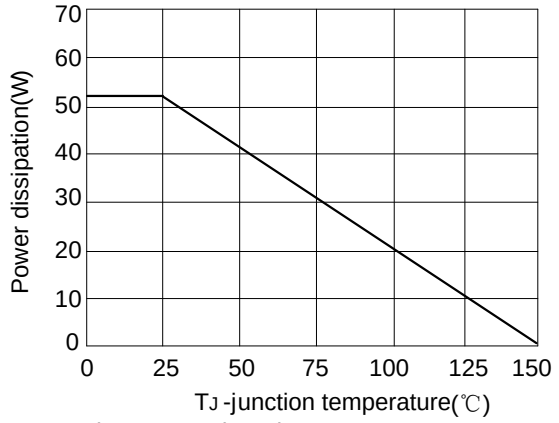


Fig.8 power de-rating

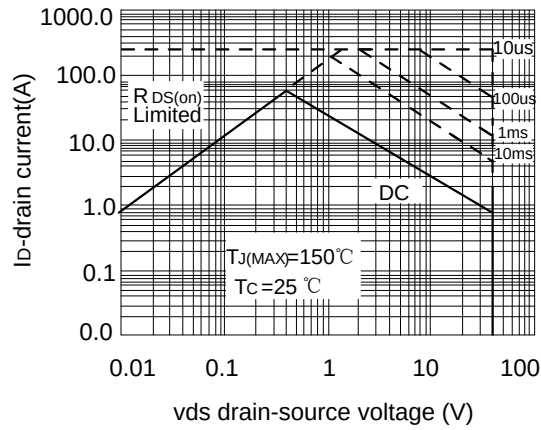


Fig.9 safe operation area

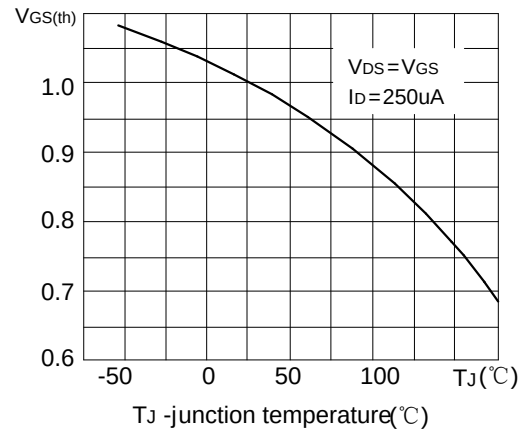
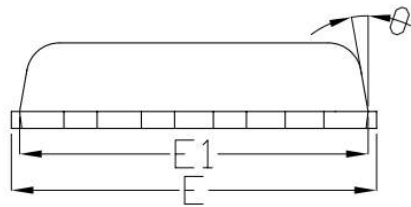
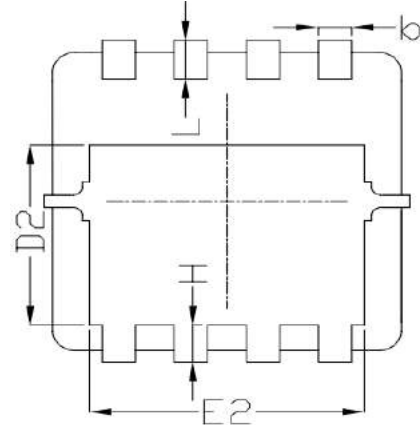
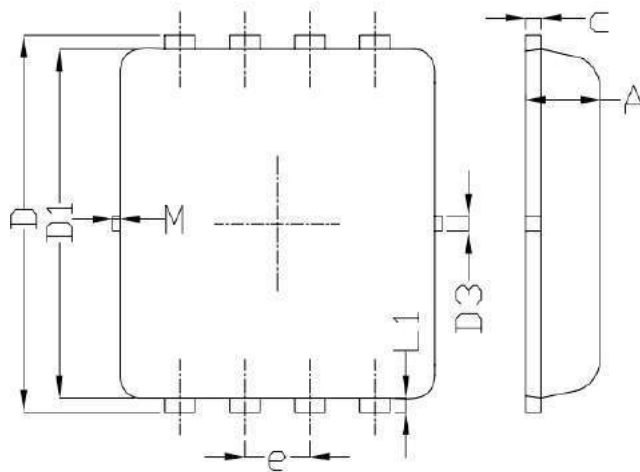
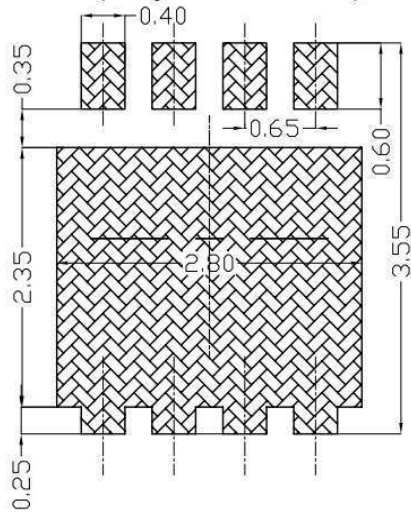


Fig.10 VGS(th) vs junction temperature

■ 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			