

■ PRODUCT CHARACTERISTICS

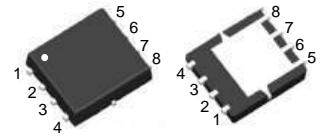
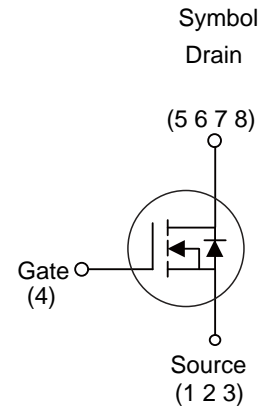
V_{DSS}	30V
$R_{DS(ON) Typ} (@V_{GS}=10V)$	6.6m Ω
$R_{DS(ON) Typ} (@V_{GS}=4.5V)$	8.6m Ω
I_D	40A

■ 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	MOT3180J	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}	± 20	V
Drain Current Continuous ($@V_{GS}=10V, T_A=25^{\circ}C$)	I_D	40	A
Drain Current Continuous ($@V_{GS}=10V, T_A=100^{\circ}C$)	I_D	28.3	A
Drain Current Pulsed	I_{DM}	160	A
Avalanche Energy *	E_{AS}	64	mJ
Power Dissipation	P_D	35	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}	3.5	$^{\circ}C/W$

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

■ 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}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Drain to Source Leakage Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	6.6	8.6	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	8.6	11.2	m Ω
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.55	2.5	V
Dynamic characteristics						
Gate capacitance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$	-	4.3	-	Ω
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=5A$	-	9	-	S
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V$ $f=1.0\text{MHz}$	-	775	-	pF
Output Capacitance	C_{oss}		-	133	-	pF
Reverse Transfer Capacitance	C_{rss}		-	95	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=15V,$ $I_D=20A, R_G=6\Omega$	-	9	-	ns
Rise Time	t_r		-	8	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	28	-	ns
Fall Time	t_f		-	25	-	ns
Total Gate Charge	Q_g	$I_D=20A, V_{DS}=15V$ $V_{GS}=10V$	-	32.3	-	nC
Gate to Source Charge	Q_{gs}		-	4.9	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	6.9	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	40	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	160	A
Diode Forward Voltage	V_{SD}	$I_{SD}=1A, V_{GS}=0V$	-	0.71	1.2	V
Reverse Recovery Time	t_{rr}	$I_{SD}=20A, T_J=25^{\circ}\text{C}$ $di/dt=100A/\mu s$	-	27	-	ns
Reverse Recovery Charge	Q_{rr}		-	20	-	nC

■ TYPICAL CHARACTERISTICS

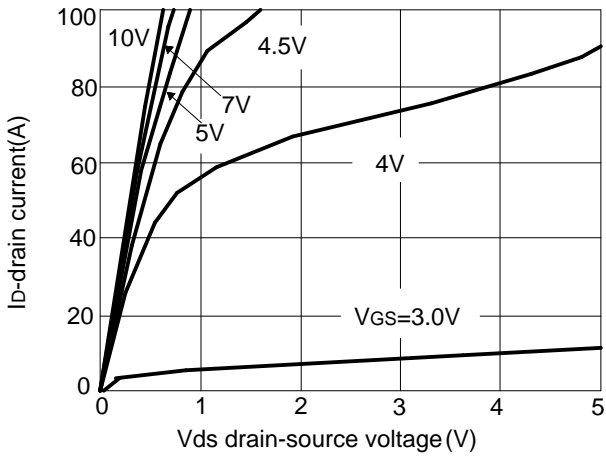


Figure.1 Output characteristics

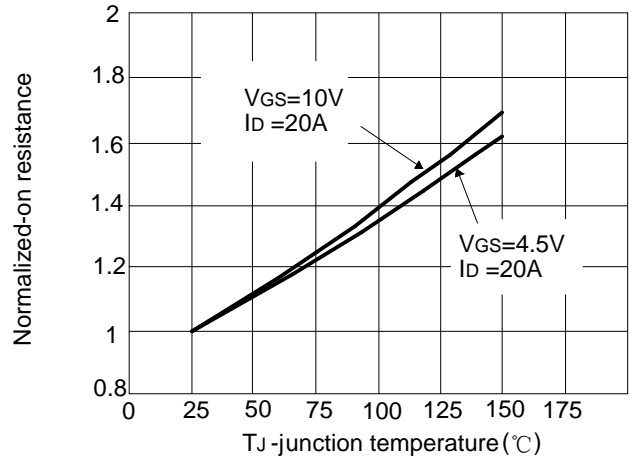


Figure.2 Rds(on)-junction temperature

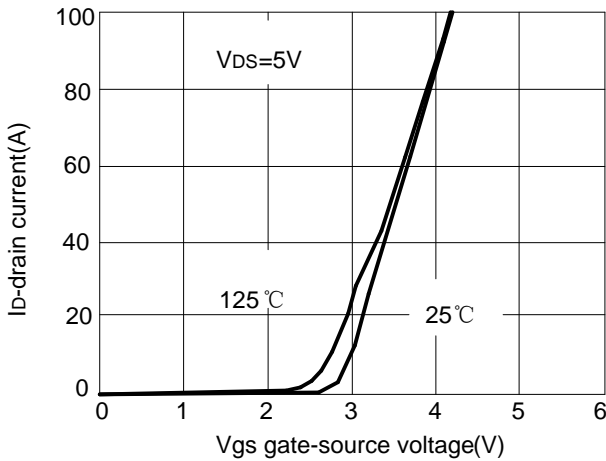


Figure.3 Transfer characteristics

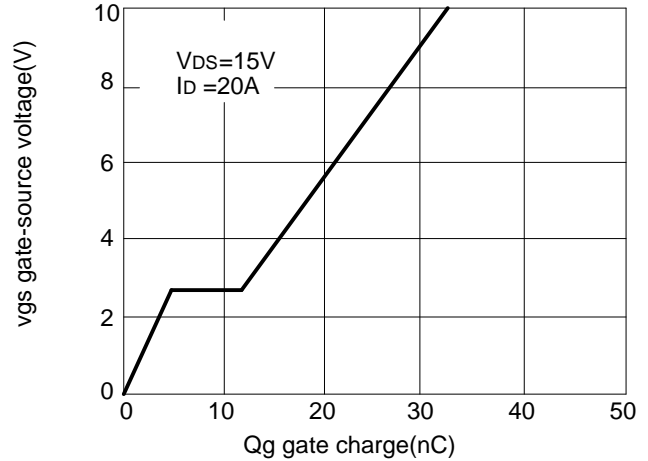


Figure.4 Gate charge

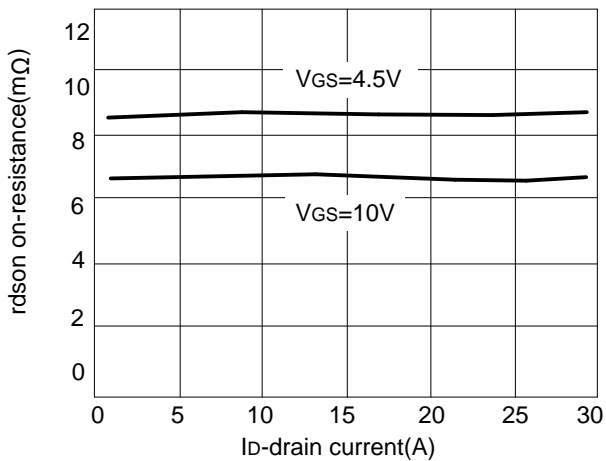


Figure.5 Rds(on)-drain current

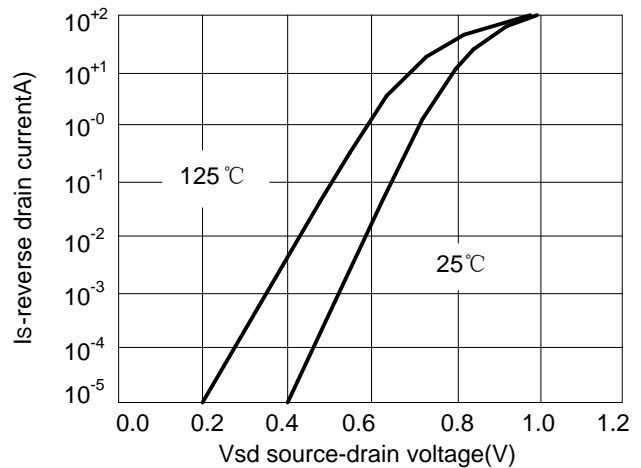


Figure.6 Source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

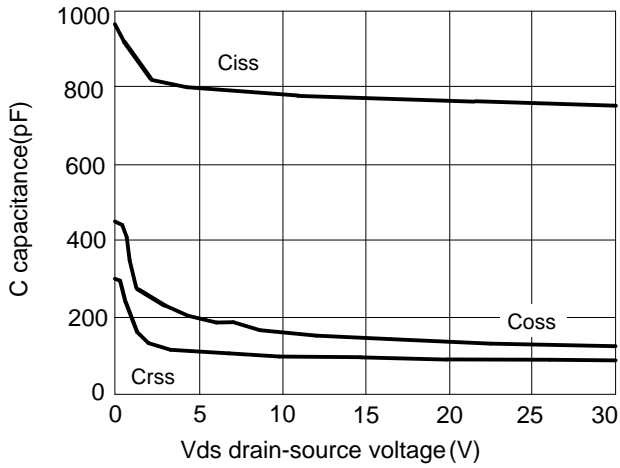


Figure.7 Capacitance vs vds

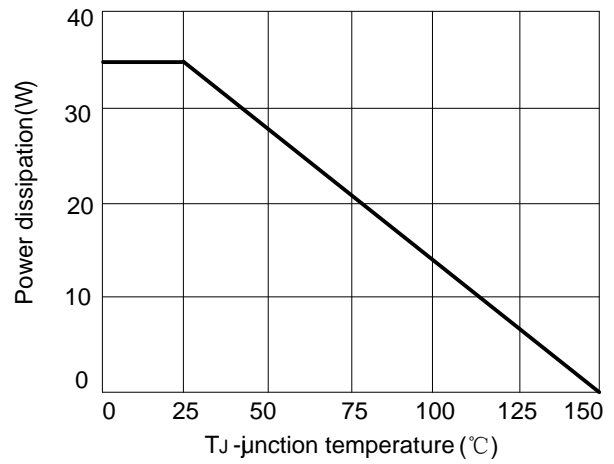


Figure.8 Power de-rating

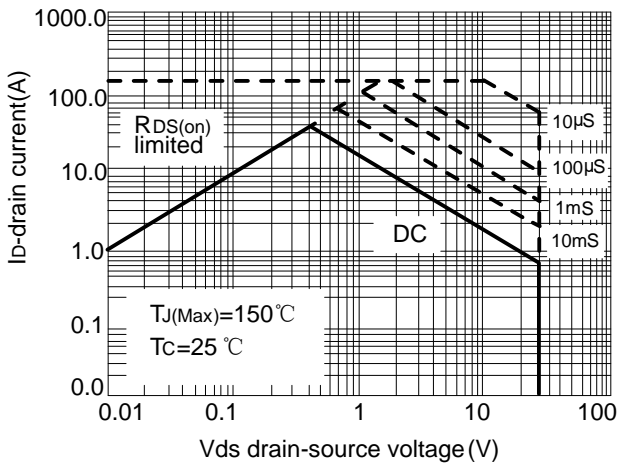


Figure.9 Safe operation area

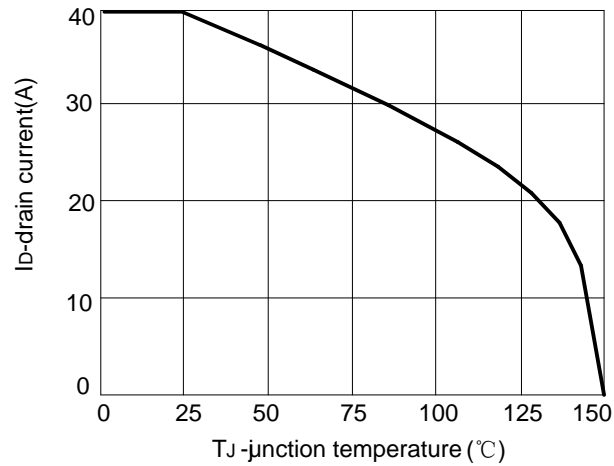
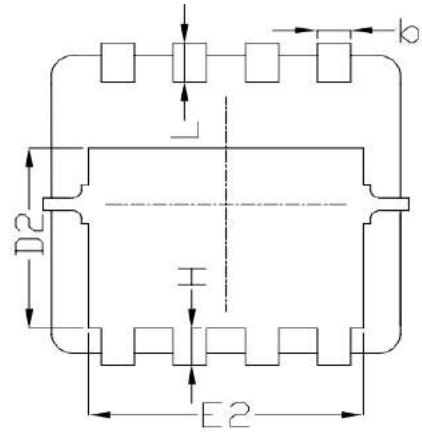
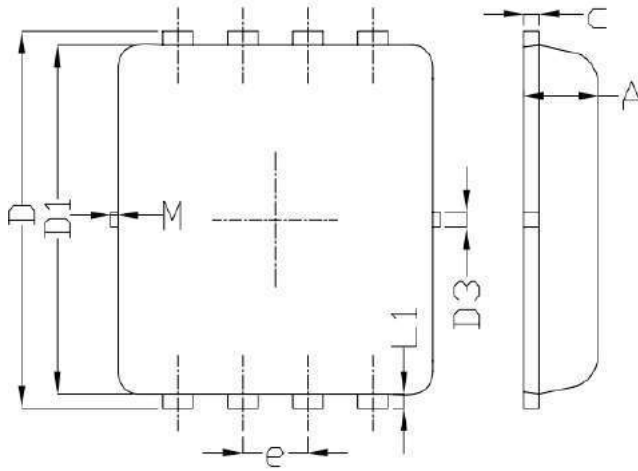
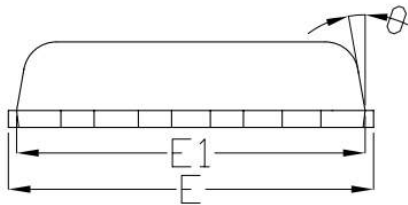


Figure.10 Id current-junction temperature

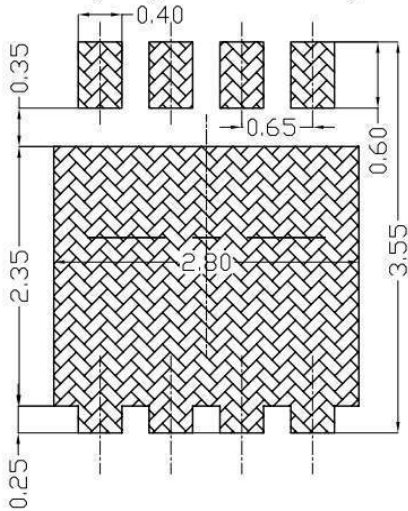
■ PDFN3X3 PACKAGE OUTLINE DIMENSIONS



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Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REOMTS		
	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			