

PRODUCT CHARACTERISTICS

V_{DSS}	60V
$R_{DS(ON)}$ Typ(@ $V_{GS}=10V$)	4.3m Ω
$R_{DS(ON)}$ Typ(@ $V_{GS}=4.5V$)	5.7m Ω
I_D	90A

APPLICATIONS

- * Motor Control
- * High Performance SMPS
- * DC/DC Converter

FEATURE

- * Low Gate Charge
- * Ultra-low $R_{DS(ON)}$

ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT6142J	PDFN3X3	5000 pieces/Reel

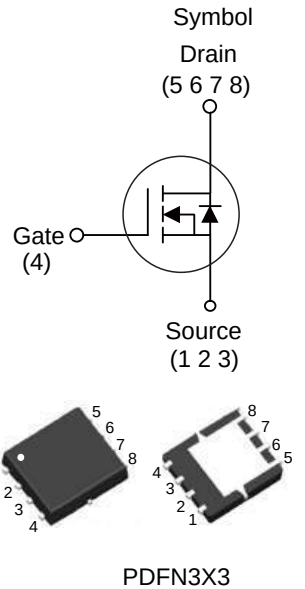
ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current Continuous(@ $V_{GS}=10V$, $T_A=25^{\circ}C$)	I_D	90	A
Drain Current Pulsed	I_{DM}	360	A
Avalanche Energy *	E_{AS}	240	mJ
Power Dissipation	P_D	75	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}	1.66	$^{\circ}C/W$

Note: * EAS condition: $T_J=25^{\circ}C$, $V_{DD}=30V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$



■ 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	60	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1	μA
Gate to Source Forward Leakage	I _{GSS(F)}	V _{DS} =0V, V _{GS} =+20V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS(R)}	V _{DS} =0V, V _{GS} =-20V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	4.3	5.3	mΩ
		V _{GS} =4.5V, I _D =15A	-	5.7	7	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1	1.9	2.5	V
Dynamic characteristics						
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V ,f=1.0MHz	-	2.3	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =3 A	10	-	-	S
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V f=1.0MHz	-	1900	-	pF
Output Capacitance	C _{oss}		-	750	-	pF
Reverse Transfer Capacitance	C _{rss}		-	56	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	I _D =20A, V _{DS} =30V R _G =3Ω ,V _{GS} =10V	-	8.8	-	ns
Rise Time	t _r		-	30	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	41	-	ns
Fall Time	t _f		-	18.9	-	ns
Total Gate Charge	Q _g	I _D =20A, V _{DS} =30V V _{GS} =10V	-	39	-	nC
Gate to Source Charge	Q _{gs}		-	8.4	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	6.8	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _S		-	-	90	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	360	A
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.72	1.2	V
Reverse Recovery Time	t _{rr}	I _{SD} =20A, T _j =25 °C	-	42	-	ns
Reverse Recovery Charge	Q _{rr}	dI /dt=100A/μs	-	38	-	nC

TYPICAL CHARACTERISTICS

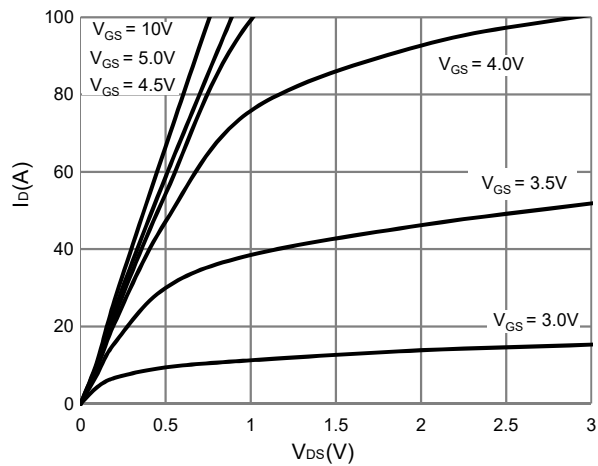


Figure 1: Saturation characteristics

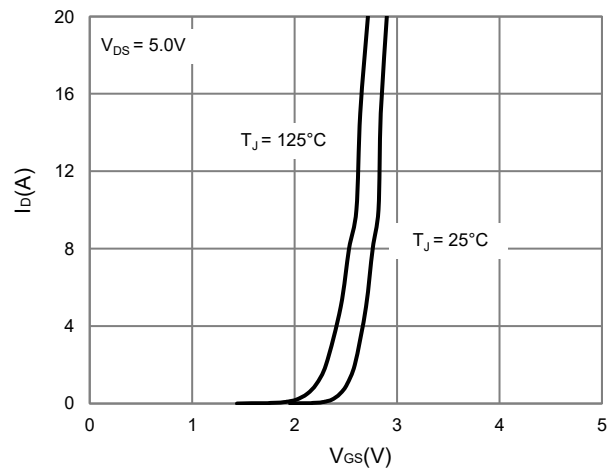


Figure 2: Transfer characteristics

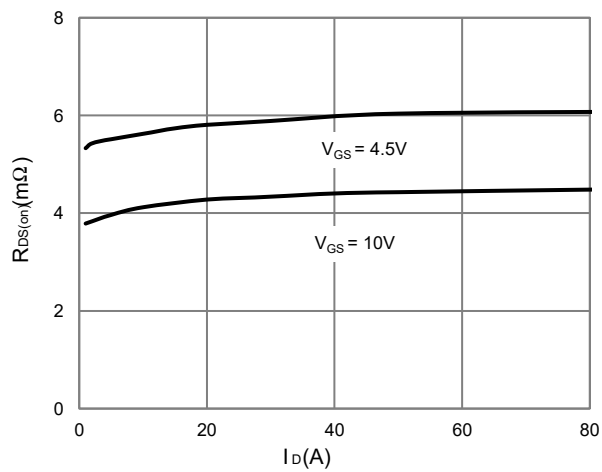


Figure 3: $R_{DS(on)}$ vs. drain current

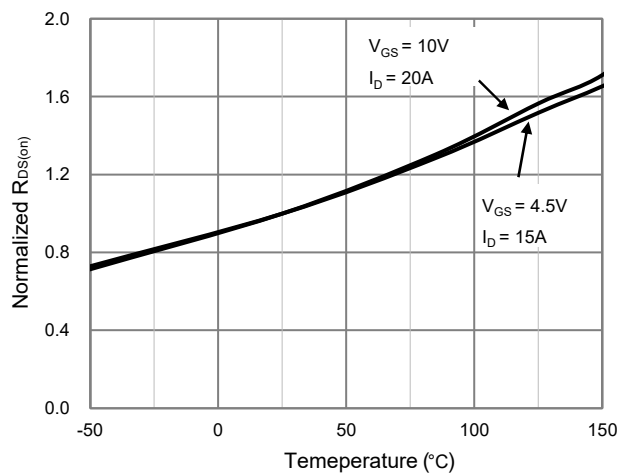


Figure 4: $R_{DS(on)}$ vs. junction temperature

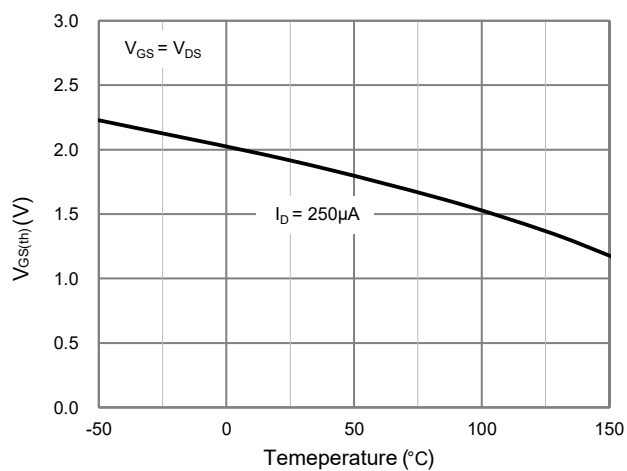


Figure 5: $V_{GS(th)}$ vs. junction temperature

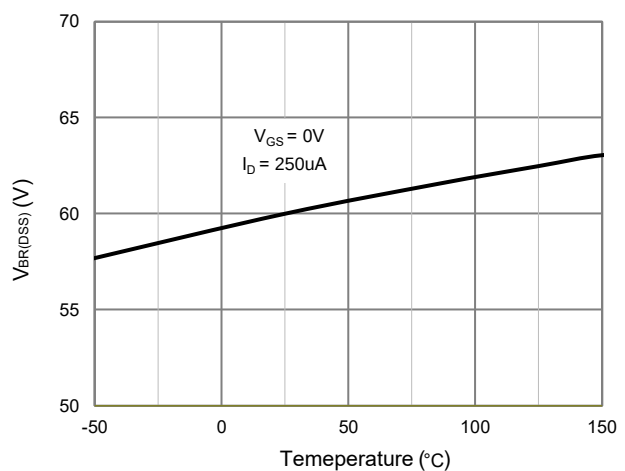


Figure 6: $V_{BR(DSS)}$ vs. junction temperature

■ TYPICAL CHARACTERISTICS(Cont.)

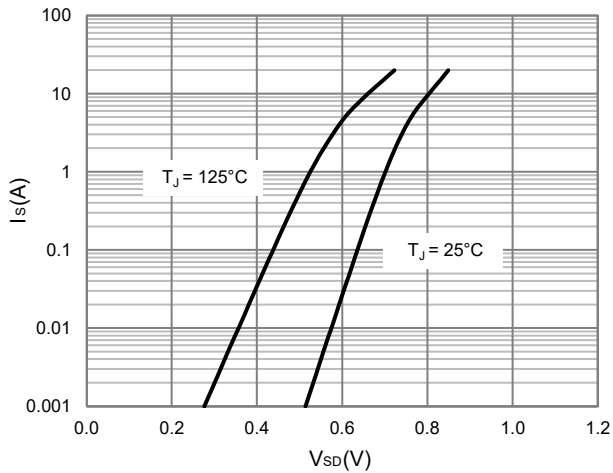


Figure 7: Body-diode characteristics

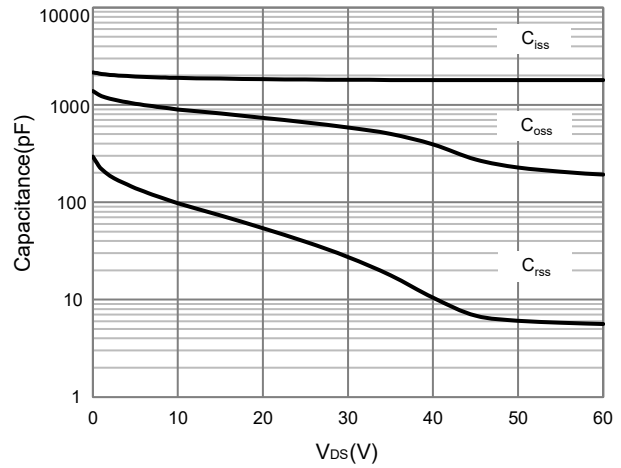


Figure 8: Capacitance characteristics

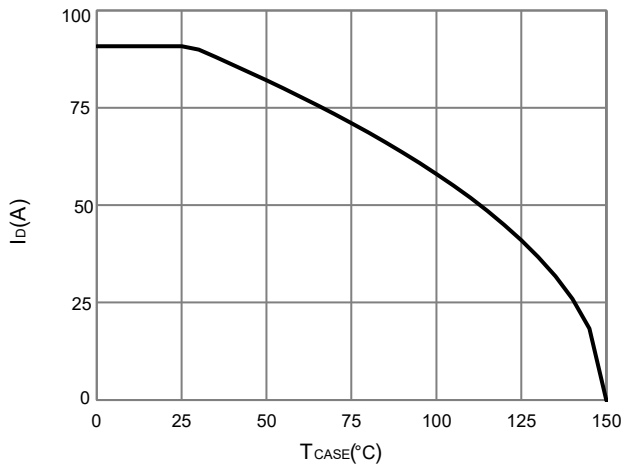


Figure 9: Current de-rating

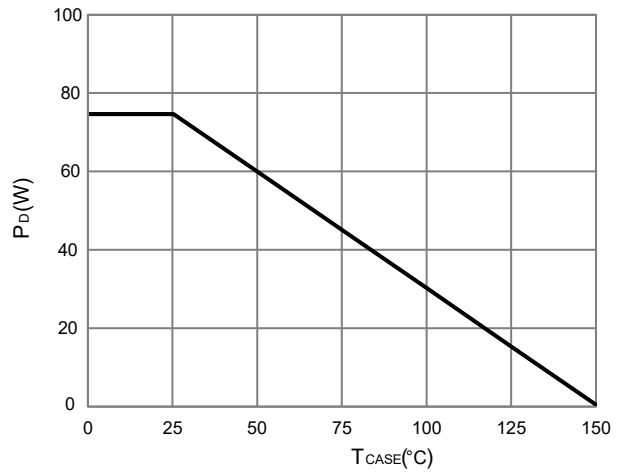


Figure 10: Power de-rating

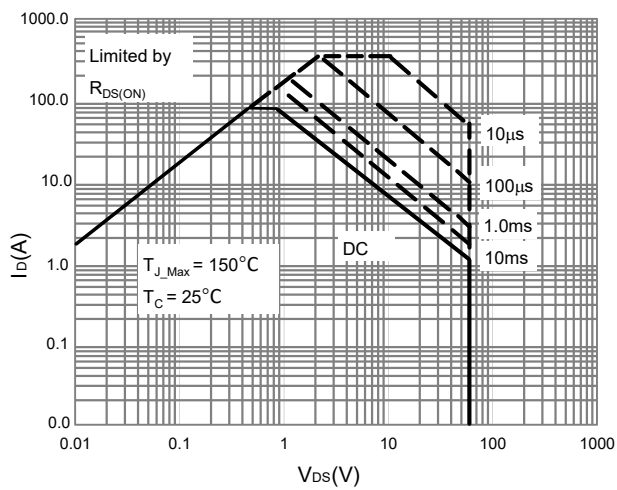
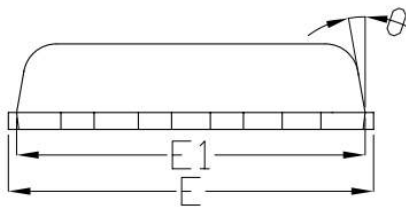
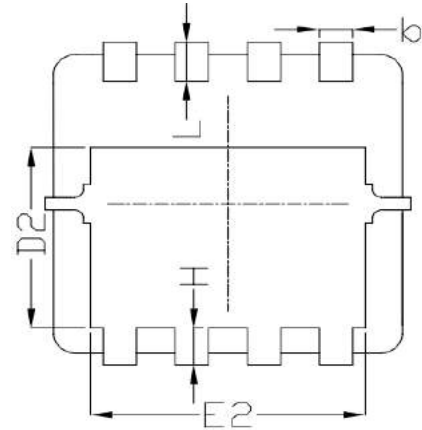
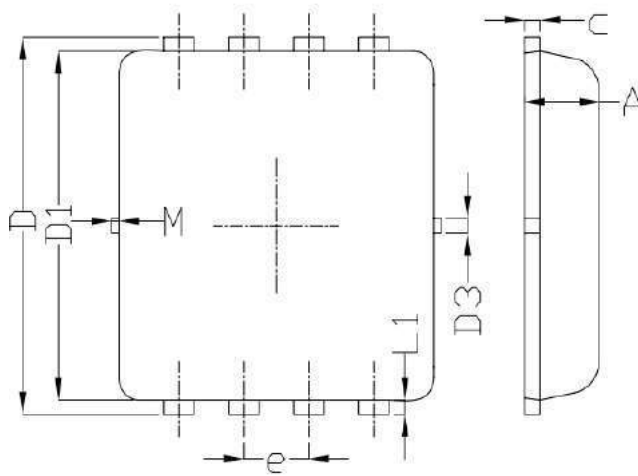
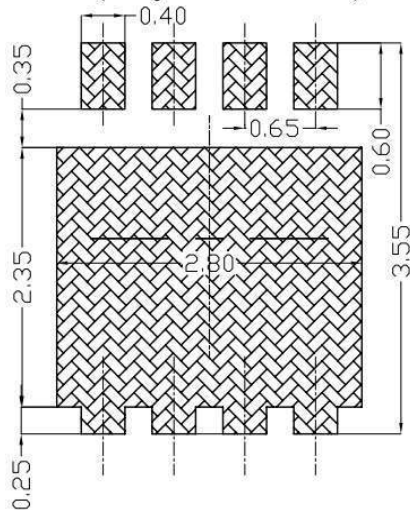


Figure 11: Maximum safe operating area

■ PDFN3X3 Package Mechanical Data



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			