

PRODUCT CHARACTERISTICS

VDSS	60V
$R_{DS(on)typ}(V_{GS}=10V)$	4.7mΩ
$R_{DS(on)typ}(V_{GS}=4.5V)$	6.5mΩ
ID	69A

FEATURES

Advanced Trench Technology
Excellent $R_{DS(ON)}$ and Low Gate Charge
Lead free product is acquired

APPLICATION

PWM Applications
Load Switch
Power Management

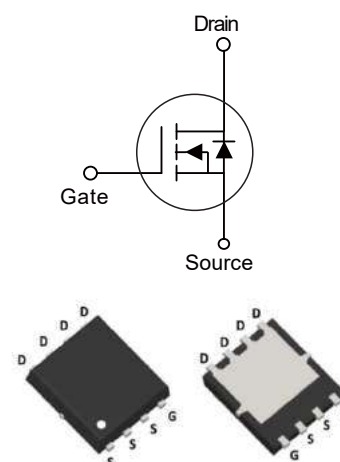
ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT6142J	PDFN3X3-8L	5000 pieces /Reel

ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-to-Source Voltage		V _{DS}	60	V
Gate-to-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _C = 25°C	I _D	69	A
	T _C = 100°C	I _D	43	A
Pulsed Drain Current		I _{DM}	276	A
Avalanche Energy		E _{AS}	182	mJ
Power Dissipation	T _C = 25°C	P _D	70	W
	T _C = 100°C	P _D	26	W
Thermal Resistance, Junction-to-Case		R _{θJC}	1.78	°C/W
Junction & Storage Temperature Range		T _J , T _{STG}	-55 to 150	°C

Symbol



■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\text{V}$, $V_{GS} = 0\text{V}$	-	-	1.0	μA
		$T_J = 55^{\circ}\text{C}$	-	-	5.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	1	-	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$	-	4.7	5.7	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}$, $I_D = 15\text{A}$	-	6.5	7.5	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}$, $I_D = 20\text{A}$	10	-	-	S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$	-	0.70	1.0	V
Diode Continuous Current	I_S	$T_C = 25^{\circ}\text{C}$	-	-	39	A
Dynamic parameters						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 20\text{V}$, $f = 1\text{MHz}$	-	1900	-	pF
Output Capacitance	C_{oss}		-	750	-	pF
Reverse Transfer Capacitance	C_{rss}		-	56	-	pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}$, $V_{DS} = 0\text{V}$, $f = 1\text{MHz}$	-	5.0	-	Ω
Switching parameters						
Total Gate Charge (@ $V_{GS} = 10\text{V}$)	Q_g	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 30\text{V}$, $I_D = 20\text{A}$	-	39	-	nC
Total Gate Charge (@ $V_{GS} = 4.5\text{V}$)	Q_g		-	18.4	-	nC
Gate Source Charge	Q_{gs}		-	8.4	-	nC
Gate Drain Charge	Q_{gd}		-	6.8	-	nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 30\text{V}$ $R_L = 1.5\Omega$, $R_{GEN} = 3\Omega$	-	8.8	-	ns
Turn-On Rise Time	t_r		-	30	-	ns
Turn-Off DelayTime	$t_{D(off)}$		-	41	-	ns
Turn-Off Fall Time	t_f		-	18.9	-	ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20\text{A}$, $di_F/dt = 100\text{A}/\mu\text{s}$	-	42	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 20\text{A}$, $di_F/dt = 100\text{A}/\mu\text{s}$	-	38	-	nC

■ TYPICAL CHARACTERISTICS

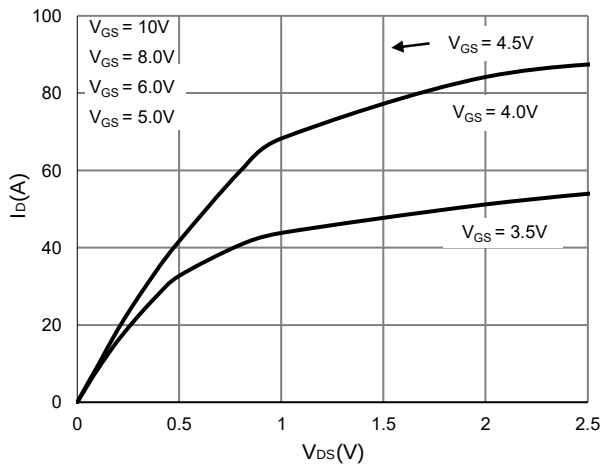


Figure 1: Saturation characteristics

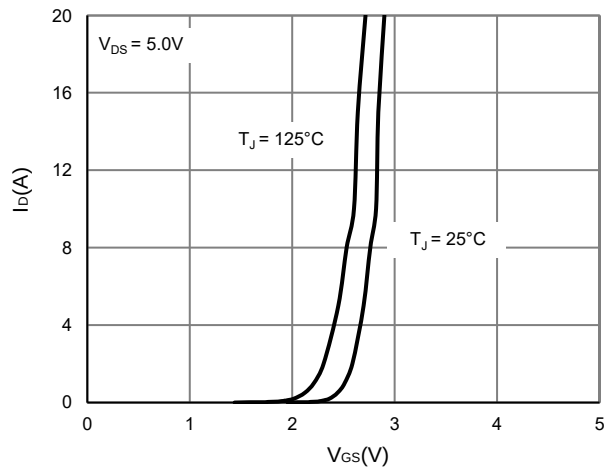


Figure 2: Transfer characteristics

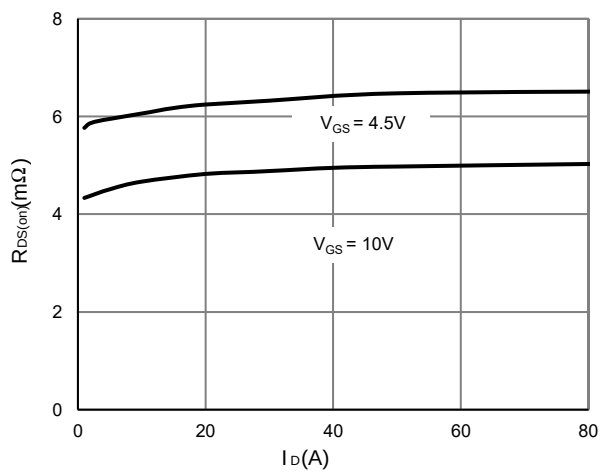


Figure 3: $R_{DS(on)}$ vs. drain current

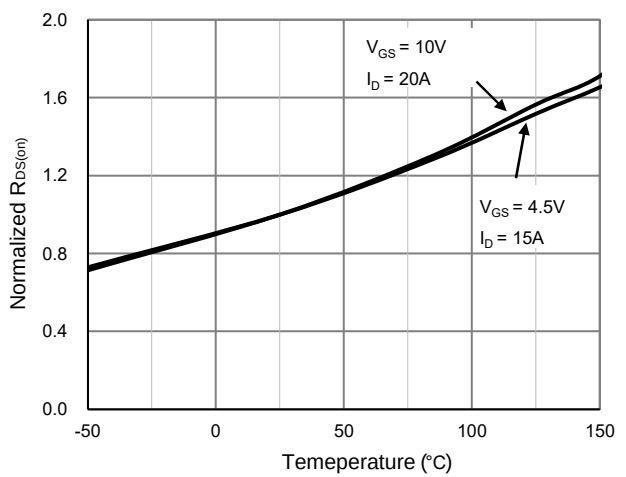


Figure 4: $R_{DS(on)}$ vs. junction temperature

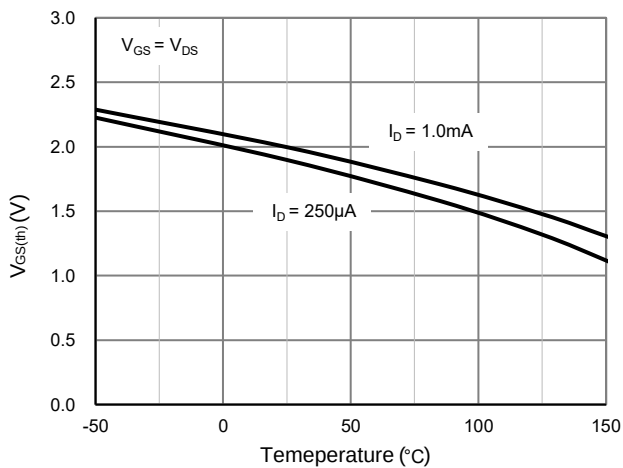


Figure 5: $V_{GS(th)}$ vs. junction temperature

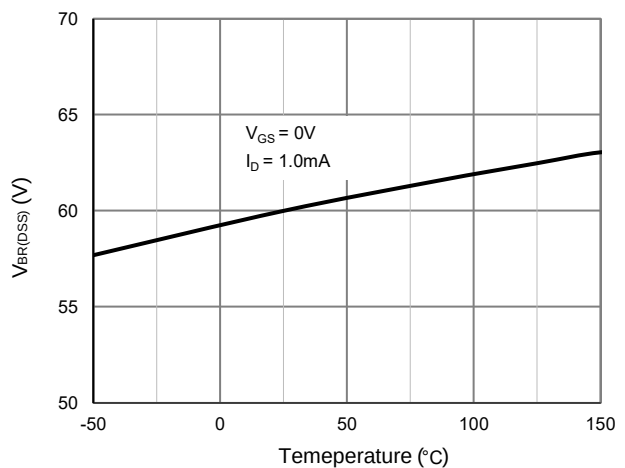


Figure 6: $V_{BR(DSS)}$ vs. junction temperature

■ TYPICAL CHARACTERISTICS(Cont.)

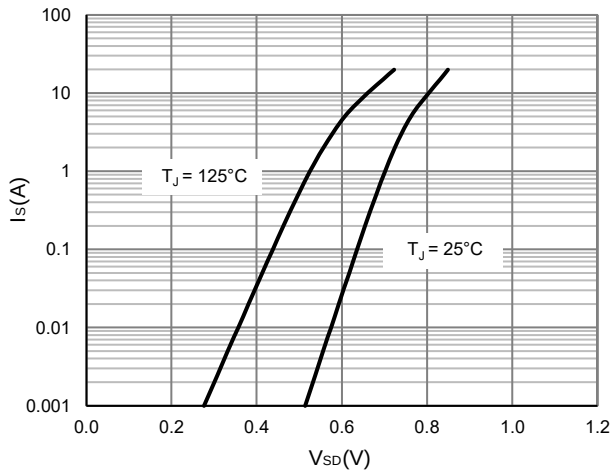


Figure 7: Body-diode characteristics

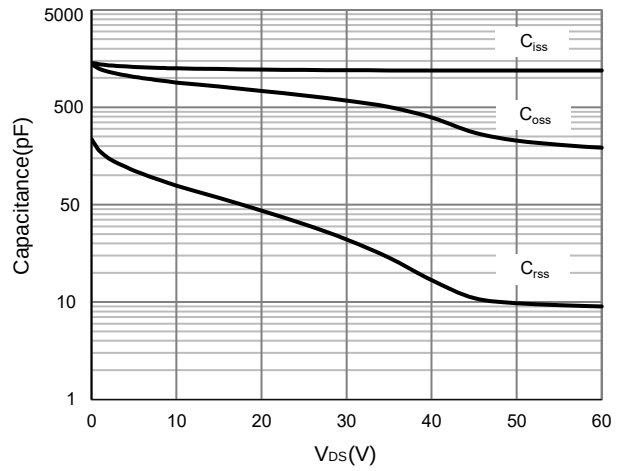


Figure 8: Capacitance characteristics

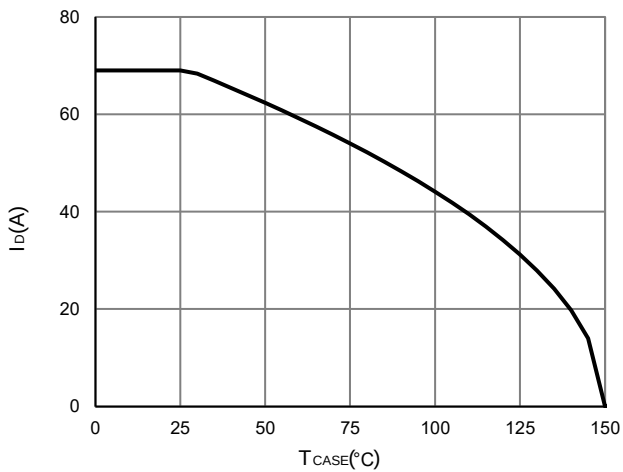


Figure 9: Current de-rating

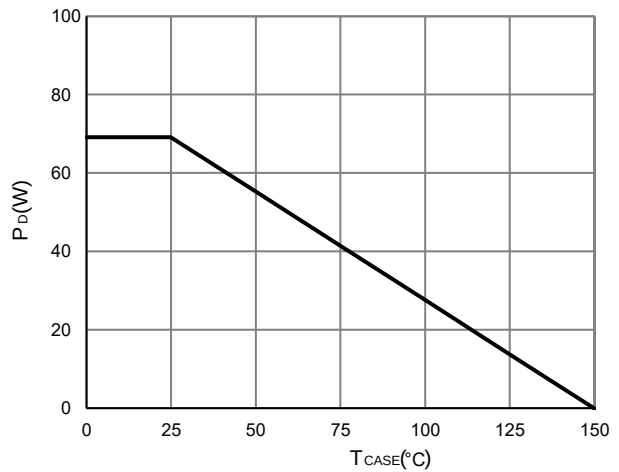


Figure 10: Power de-rating

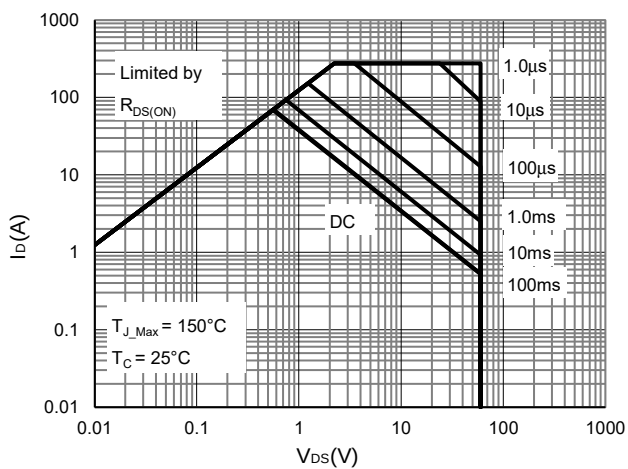
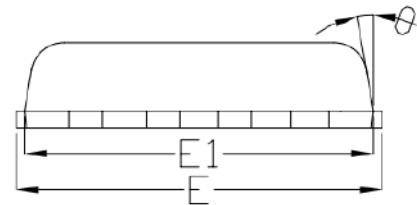
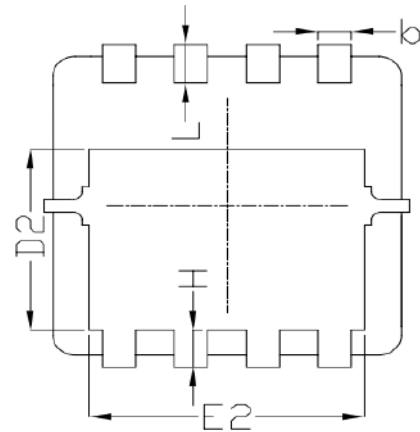
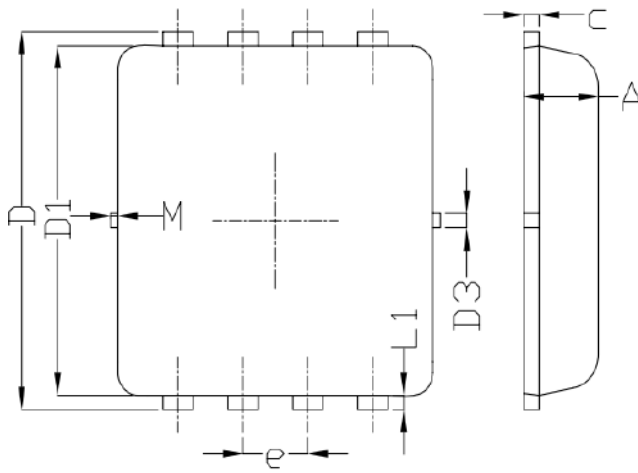
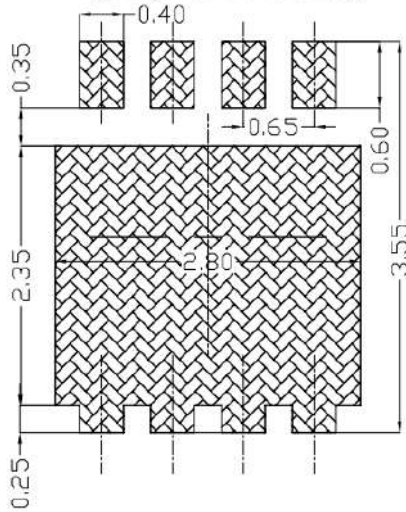


Figure 11: Maximum safe operating area

■ PDFN3X3-8L Package Mechanical Data



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			