

■ PRODUCT CHARACTERISTICS

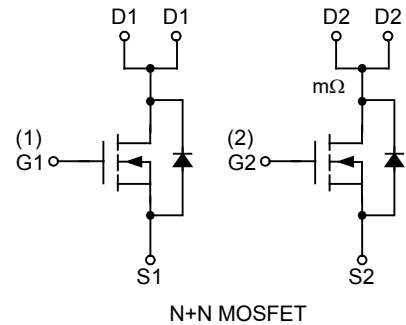
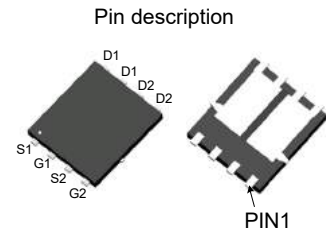
$V_{DSS}$	60V
$R_{DS(on)typ}(V_{GS}=10V)$	22.5mΩ
$R_{DS(on)typ}(V_{GS}=4.5V)$	28mΩ
$I_D$	20A

■ FEATURE

- Low  $R_{DS(ON)}$
- Low gate charge
- Pb-free lead plating

■ APPLICATIONS

- Motor driving in power tool
- E-vehicle robotics



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-free	Halogen		
N/A	MOT6929J	PDFN3X3-8L	5000Pieces/Reel

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

Parameter	Symbol	Value	units
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	$T_C=25^\circ C$	20
		$T_C=100^\circ C$	13
Pulsed Drain Current	$I_{DM}$	80	A
Avalanche Energy	$E_{AS}$	13.5	mJ
Maximum Power Dissipation	$P_D$	$T_C=25^\circ C$	28
		$T_C=100^\circ C$	11.1
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

■ THERMAL CHARACTERISTICS

Parameter	Symbol	Value	units
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	70	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.2	$^\circ C/W$

■ Electrical Characteristics ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
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	$I_{DSS}$	$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$	-	-	1.0	$\mu\text{A}$
			-	-	5.0	
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.2	-	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 5\text{A}$	-	22.5	29	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 3\text{A}$	-	28	38	$\text{m}\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 5\text{V}, I_D = 5\text{A}$	-	17.0	-	S
Diode Forward Voltage	$V_{SD}$	$I_S = 1\text{A}, V_{GS} = 0\text{V}$	-	0.75	1.0	V
Diode Continuous Current	$I_S$	$T_C = 25^\circ\text{C}$	-	-	23	A
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = 30\text{V}, f = 1\text{MHz}$	-	288	-	pF
Output Capacitance	$C_{oss}$		-	92	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	22	-	pF
Gate Resistance	$R_g$	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$	-	5.0	-	$\Omega$
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_g$	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 30\text{V}, I_D = 5\text{A}$	-	50	-	nC
Gate Source Charge	$Q_{gs}$		-	6	-	nC
Gate Drain Charge	$Q_{gd}$		-	15	-	nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V}$ $R_L = 6\Omega, R_{GEN} = 6\Omega$	-	6.0	-	nS
Turn-On Rise Time	$t_r$		-	62	-	nS
Turn-Off DelayTime	$t_{D(off)}$		-	18.5	-	nS
Turn-Off Fall Time	$t_f$		-	97	-	nS
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 5\text{A}, dI_F/dt = 100\text{A}/\mu\text{S}$	-	13.0	-	nS
Body Diode Reverse Recovery Charge	$Q_{rr}$	$I_F = 5\text{A}, dI_F/dt = 100\text{A}/\mu\text{S}$	-	6.0	-	nC

■ TYPICAL CHARACTERISTICS

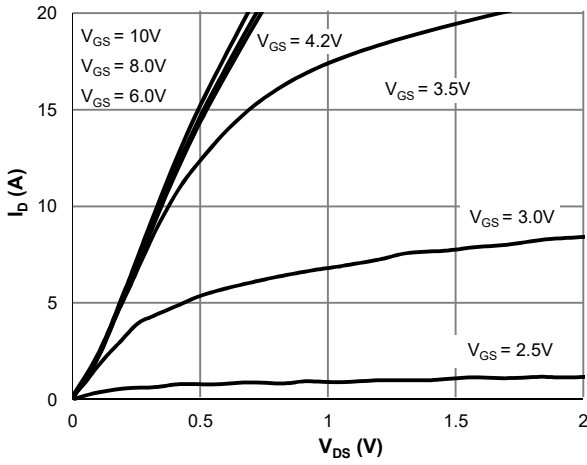


Figure 1: Saturation Characteristics

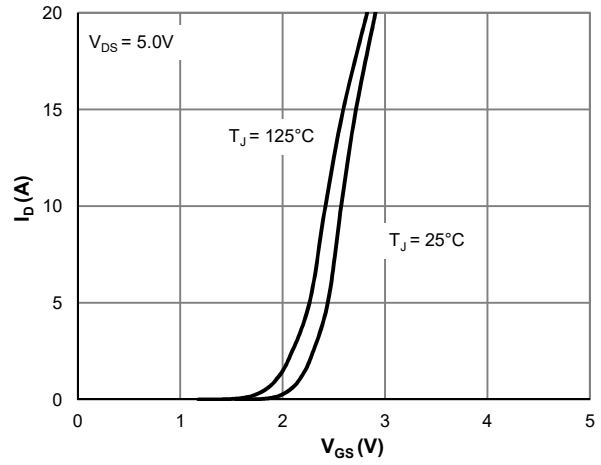


Figure 2: Transfer Characteristics

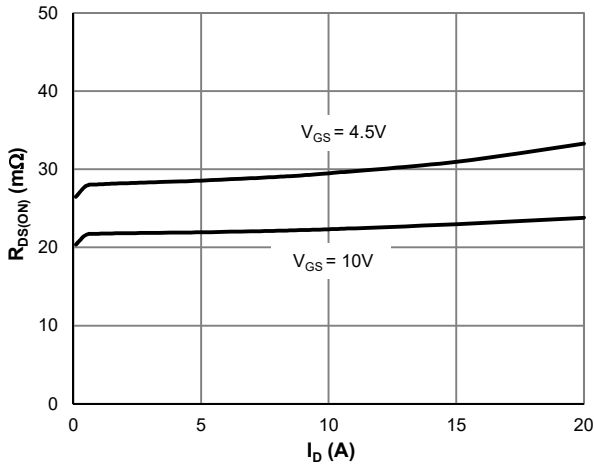


Figure 3:  $R_{DS(ON)}$  vs. Drain Current

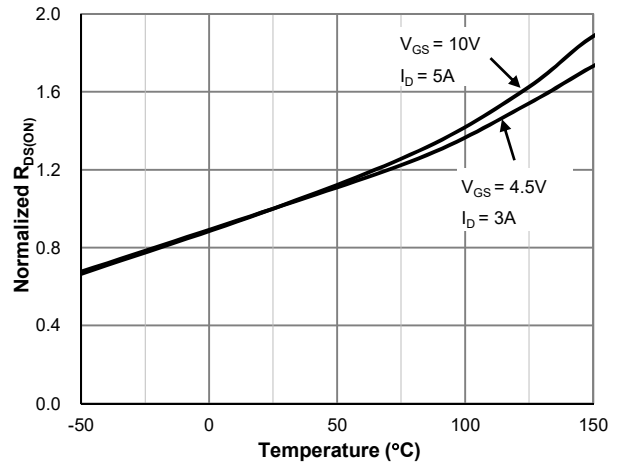


Figure 4:  $R_{DS(ON)}$  vs. Junction Temperature

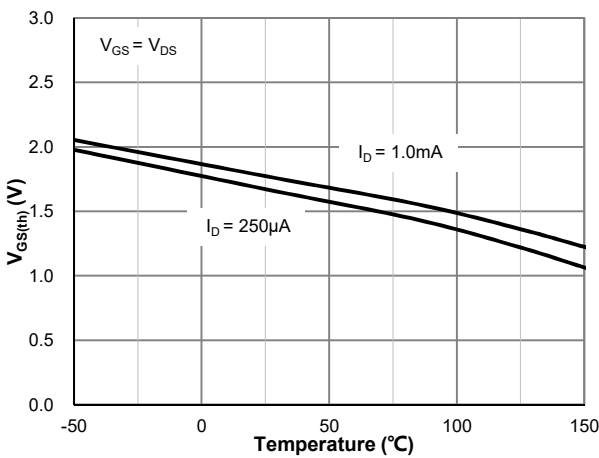


Figure 5:  $V_{GS(th)}$  vs. Junction Temperature

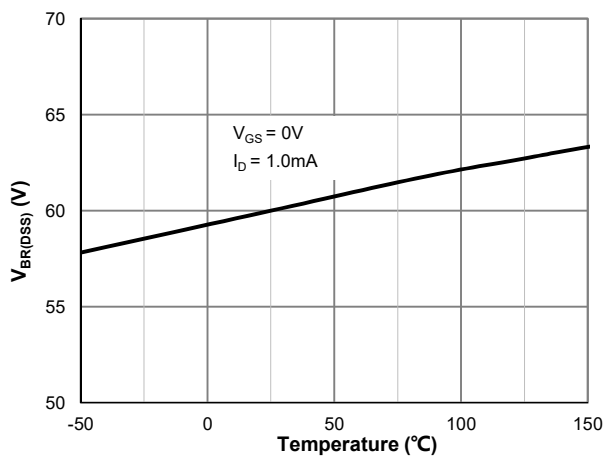


Figure 6:  $V_{BR(DSS)}$  vs. Junction Temperature

■ TYPICAL CHARACTERISTICS(Cont.)

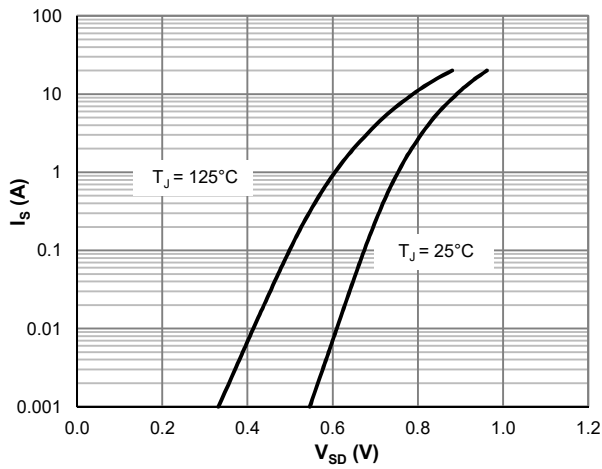


Figure 7: Body-Diode Characteristics

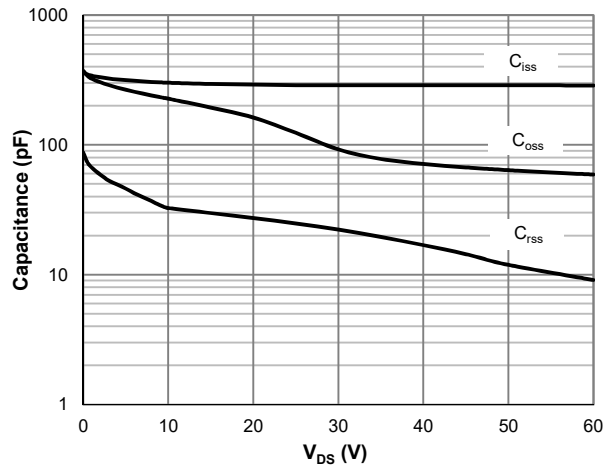


Figure 8: Capacitance Characteristics

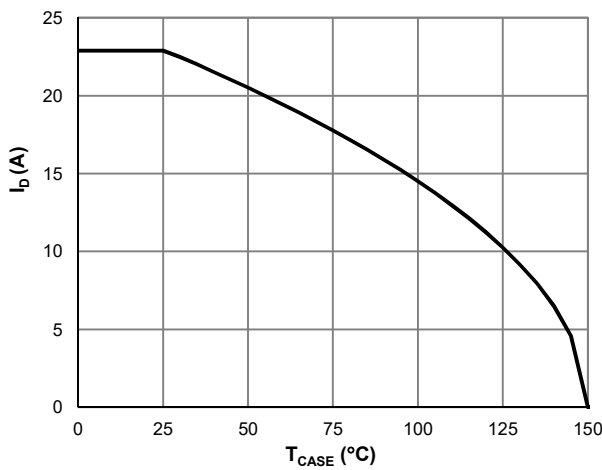


Figure 9: Current De-rating

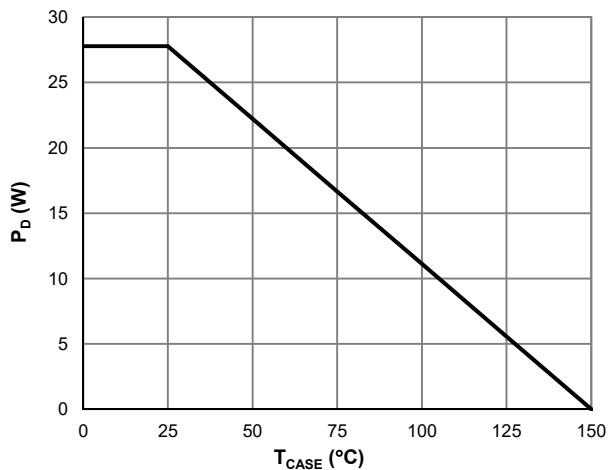


Figure 10: Power De-rating

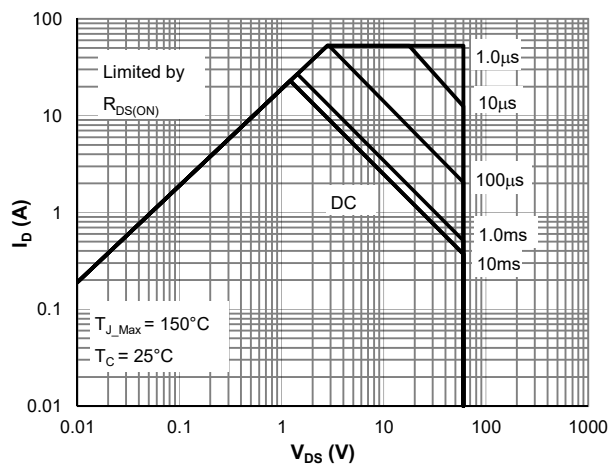


Figure 11: Maximum Safe Operating Area

■ TYPICAL CHARACTERISTICS(Cont.)

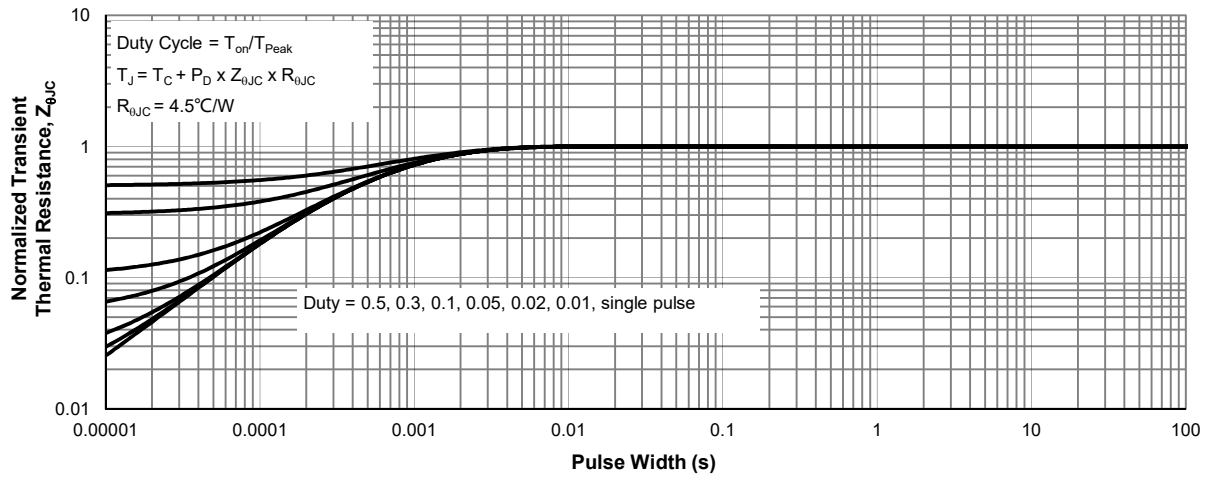
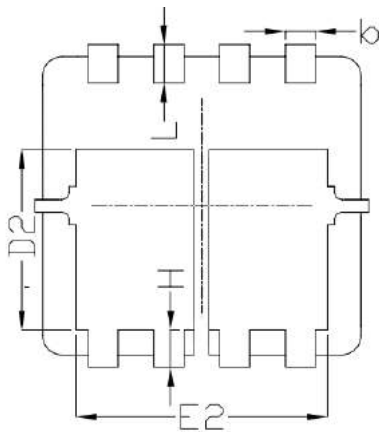
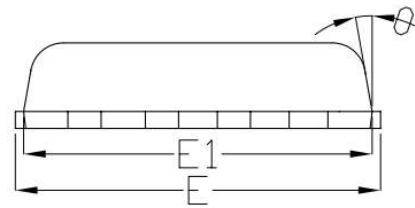
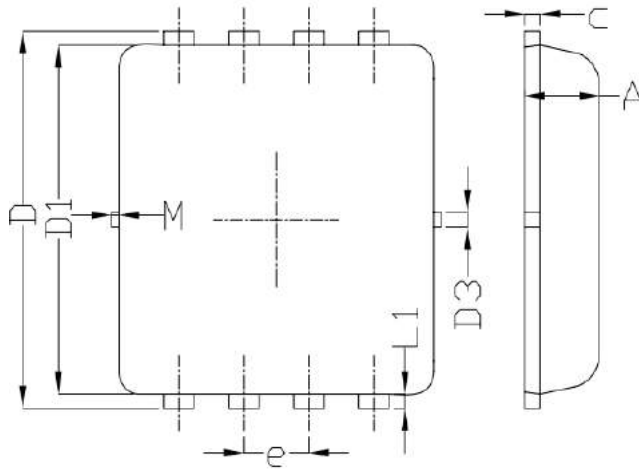


Figure 12: Normalized Maximum Transient Thermal Impedance

■ PDFN3X3-8L Package Mechanical Data



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			