

PRODUCT CHARACTERISTICS

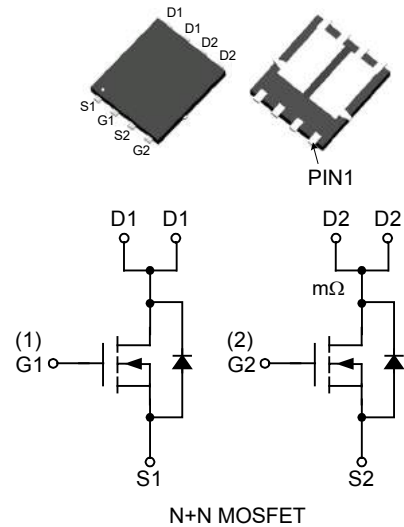
V _{DS}	40V
R _{DS(ON)Typ} (V _{GS} @ =10V)	10 mΩ
R _{DS(ON)Typ} (V _{GS} @ =4.5V)	15mΩ
I _D	40A

FEATURES

- Low R_{DS(ON)}
- Low gate charge
- Pb-free lead plating
- Halogen-free and ROHS-compliant

APPLICATIONS

- Motor driving in power tool
- E-vehicle robotics

Pin description

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4913J	PDFN3X3	5000Pieces/Reel

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DS}	40	V
Gate-to-Source Voltage	V _{GS}	±20	V
Continuous Drain	I _D	T _C = 25°C	40
		T _C = 100°C	26
Pulsed Drain Current	I _{DM}	155	A
Avalanche Energy	E _{AS}	22	mJ
Power Dissipation	P _D	T _C = 25°C	20
		T _C = 100°C	8.1
Junction & Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

THERMAL PERFORMANCE

Parameter	Symbol	Min	Max	Unit
Thermal Resistance, Junction-to-Ambient	R _{θJA}	50	60	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	5.1	6.2	°C/W

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 32\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$	-	-	1.0	μA
			-	-	5.0	
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	-	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$	-	10	13	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 15\text{A}$	-	15	19	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}, I_D = 5\text{A}$	-	95	-	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	$T_C = 25^\circ\text{C}$	-	-	20	A
DYNAMIC PARAMETERS						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 20\text{V}, f = 1\text{MHz}$	-	1227	-	pF
Output Capacitance	C_{oss}		-	526	-	pF
Reverse Transfer Capacitance	C_{rss}		-	55	-	pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$	-	2.7	-	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_g	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 20\text{V}, I_D = 20\text{A}$	-	40	-	nC
Gate Source Charge	Q_{gs}		-	4.4	-	nC
Gate Drain Charge	Q_{gd}		-	13	-	nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 20\text{V}$ $R_L = 1\Omega, R_{GEN} = 6\Omega$	-	5	-	nS
Turn-On Rise Time	t_r		-	7	-	nS
Turn-Off DelayTime	$t_{D(off)}$		-	23	-	nS
Turn-Off Fall Time	t_f		-	14.8	-	nS
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 5\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	26	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 5\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	14	-	nC

■ TYPICAL CHARACTERISTICS

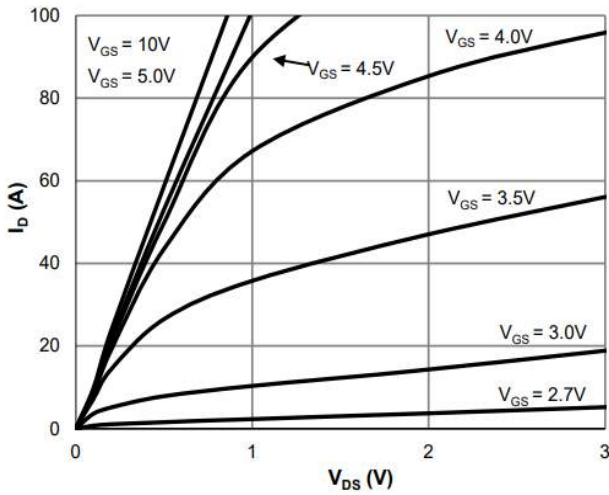


Figure 1: Saturation Characteristics

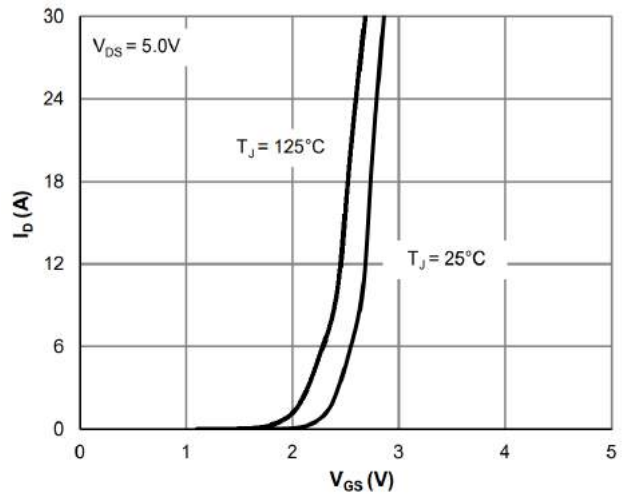


Figure 2: Transfer Characteristics

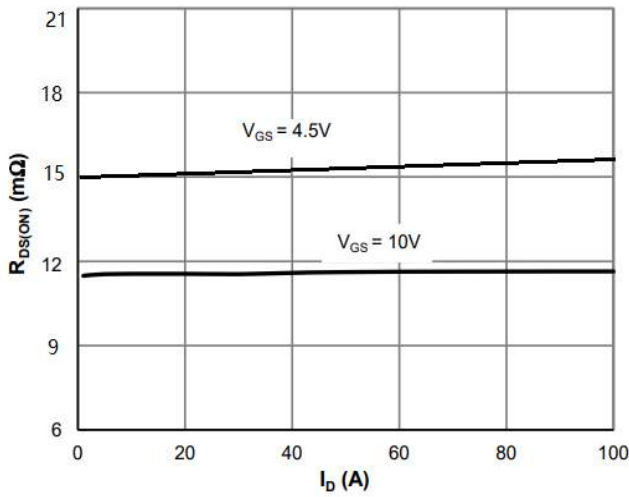


Figure 3: $R_{DS(ON)}$ vs. Drain Current

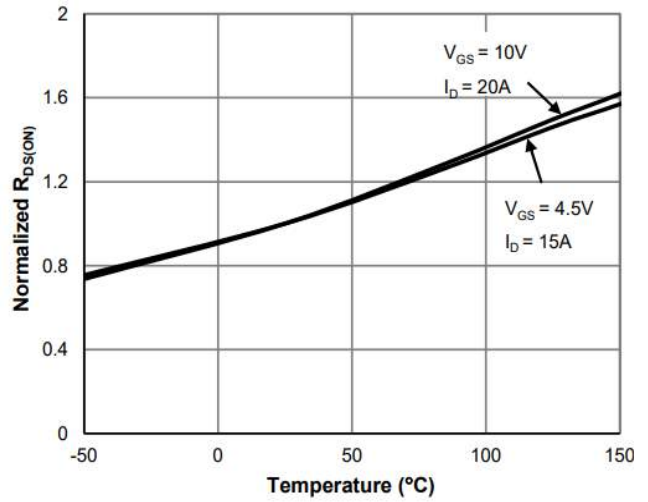


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

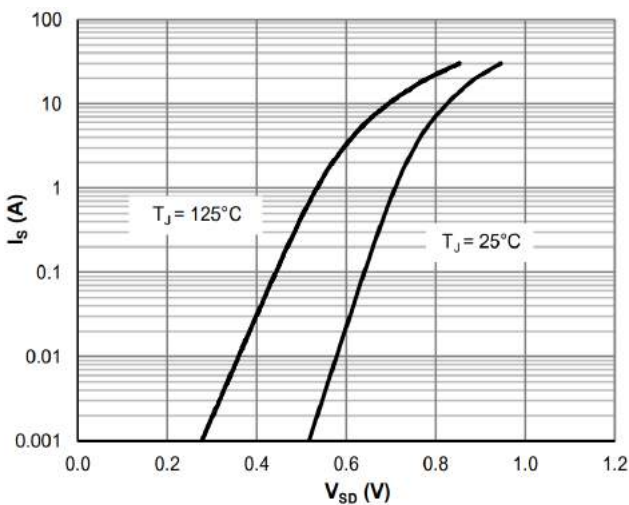


Figure 5: Body-Diode Characteristics

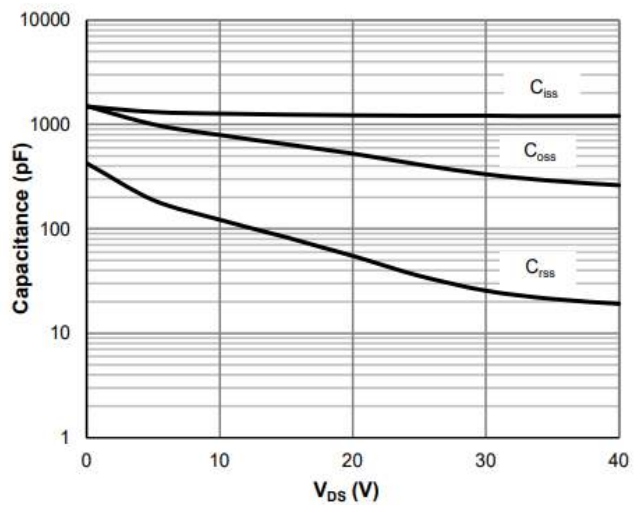


Figure 6: Capacitance Characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

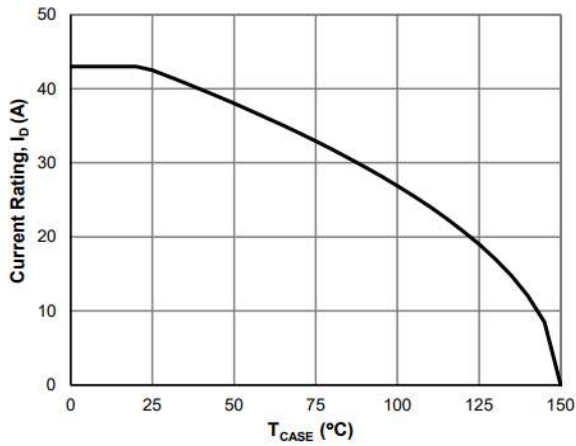


Figure 7: Current De-rating

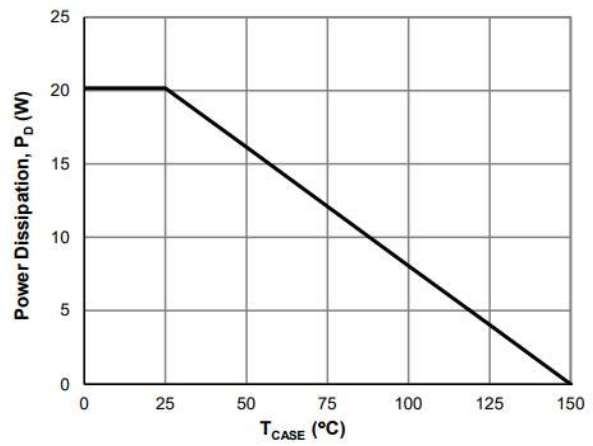


Figure 8: Power De-rating

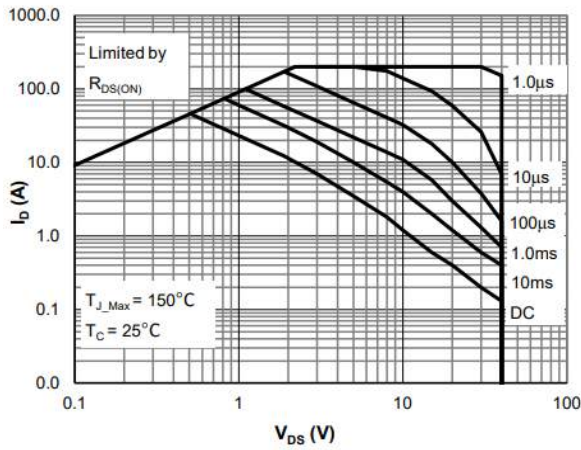


Figure 9: Maximum Safe Operating Area

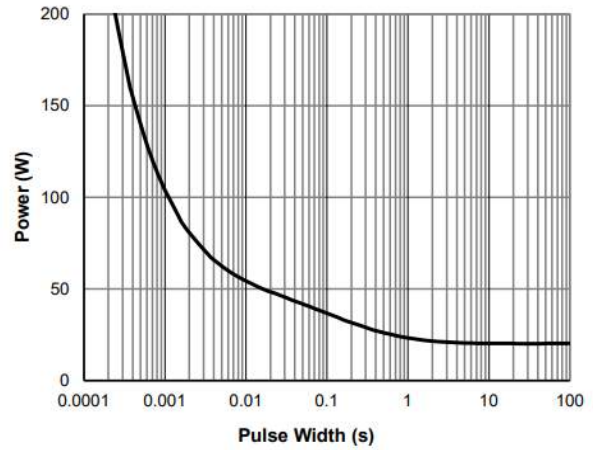


Figure 10: Single Pulse Power Rating, Junction-to-Case

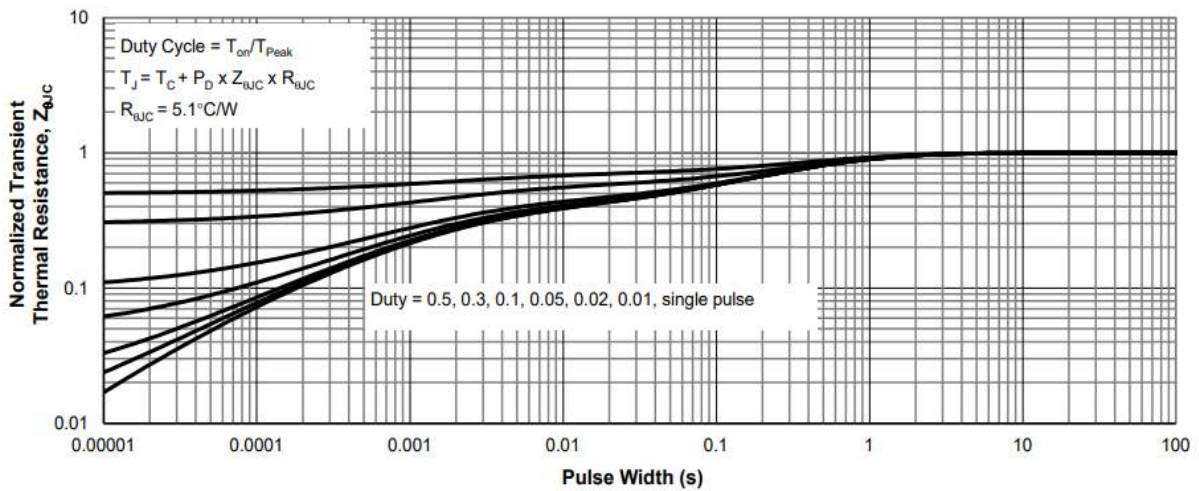


Figure 11: Normalized Maximum Transient Thermal Impedance

■ PDFN3X3-8L Package Mechanical Data

