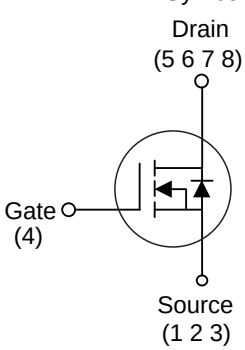
■ PRODUCT CHARACTERISTICS

V_{DSS}	40V
$R_{DS(ON)}$ Typ(@V_{GS}=10V)	3.3mΩ
$R_{DS(ON)}$ Typ(@V_{GS}=4.5V)	4.3mΩ
I_D	99A

Symbol

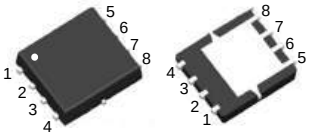


■ APPLICATIONS

* Motor Control
* High Performance SMPS
* DC/DC Coverter

■ FEATURE

* Low Gate Charge
* Ultra-low RDS(ON)



■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4133J	PDFN3X3	5000 pieces/Reel

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	40	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current Continuous(@V_{GS}=10V ,T_A=25°C)	I_D	99	A
Drain Current Pulsed	I_{DM}	396	A
Avalanche Energy *	E_{AS}	225	mJ
Power Dissipation	P_D	66	W
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-55~ +150	°C

■ THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	1.89	°C/W

Note: * EAS condition: T_J=25°C ,V_{DD}=20V,V_G=10V ,L=0.5mH,R_g=25Ω

■ ELECTRICAL CHARACTERISTICS (T_C=25°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	40	-	-	V
Drain to Source Leakage Current	I_{DSS}	V_{DS}=40V,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	-	3.3	4	mΩ
		V_{GS}=4.5V,I_D=20A	-	4.3	5.2	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	1	1.5	2.5	V
Dynamic characteristics						
Gate capacitance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	1.9	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=5V,I_D=5A	-	12	-	S
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V f=1.0MHz	-	1800	-	pF
Output Capacitance	C_{oss}		-	487	-	pF
Reverse Transfer Capacitance	C_{rss}		-	60	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	I_D=20A, V_{DS}=20V R_G=6Ω ,V_{GS}=10V	-	4.4	-	ns
Rise Time	t_r		-	5.7	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	34	-	ns
Fall Time	t_f		-	22	-	ns
Total Gate Charge	Q_g	I_D=20A, V_{DS}=20V V_{GS}=10V	-	22	-	nC
Gate to Source Charge	Q_{gs}		-	3.5	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	3.7	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	99	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	396	A
Diode Forward Voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V	-	0.7	1.2	V
Reverse Recovery Time	t_{rr}	I_{SD}=20A, T_J=25°C dI/dt=100A/μs	-	27	-	ns
Reverse Recovery Charge	Q_{rr}		-	12	-	nC

■ TYPICAL CHARACTERISTICS

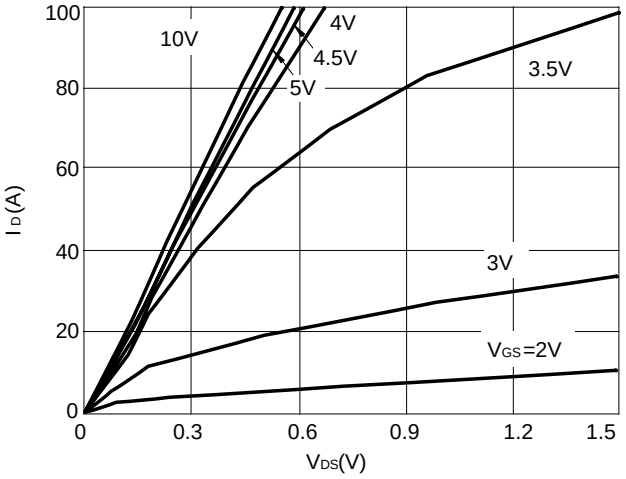


Figure 1: Output Characteristics

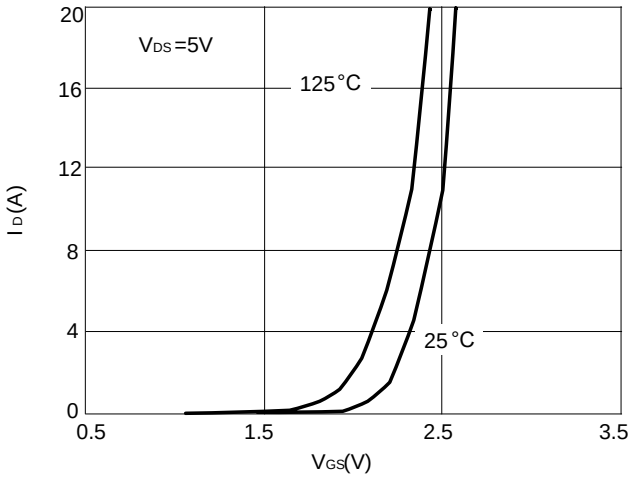


Figure 2: Transfer Characteristics

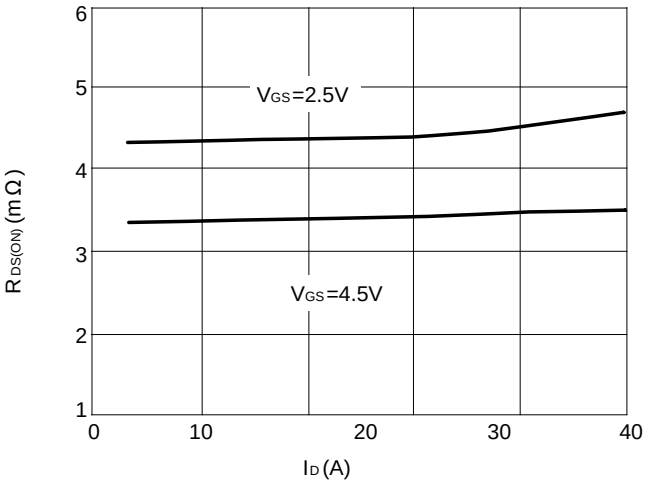


Figure 3: $R_{DS(ON)}$ vs. Drain Current

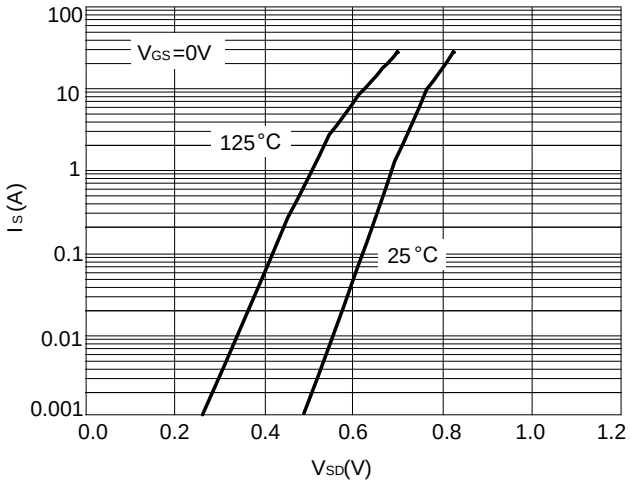


Figure 4: Body Diode Characteristics

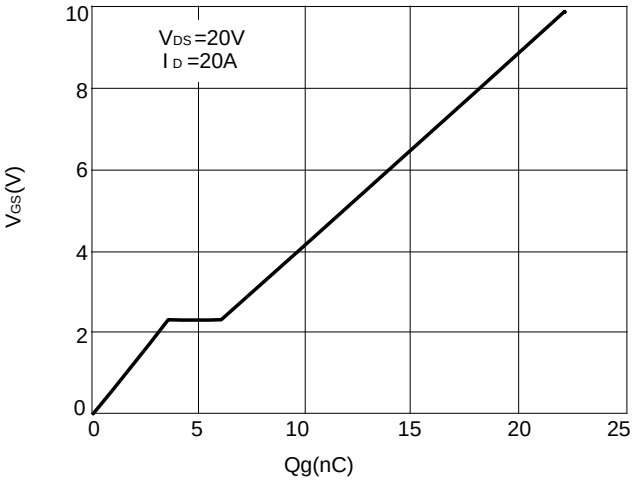


Figure 5: Gate Charge Characteristics

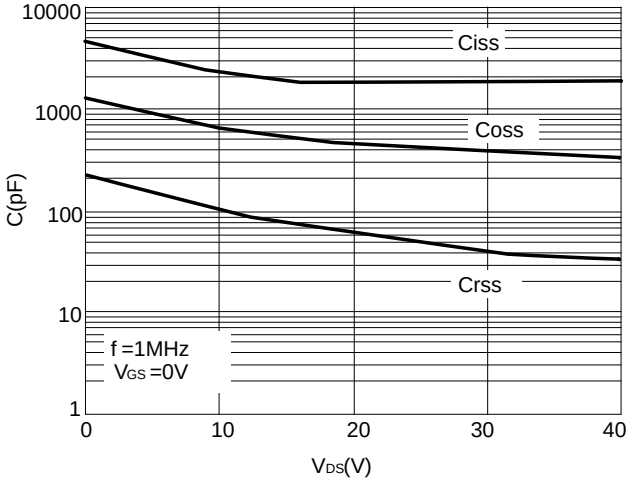


Figure 6: Capacitance Characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

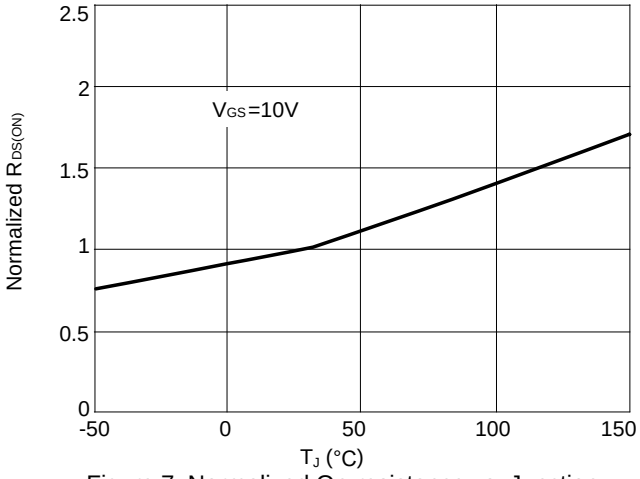


Figure 7: Normalized On-resistance vs. Junction Temperature

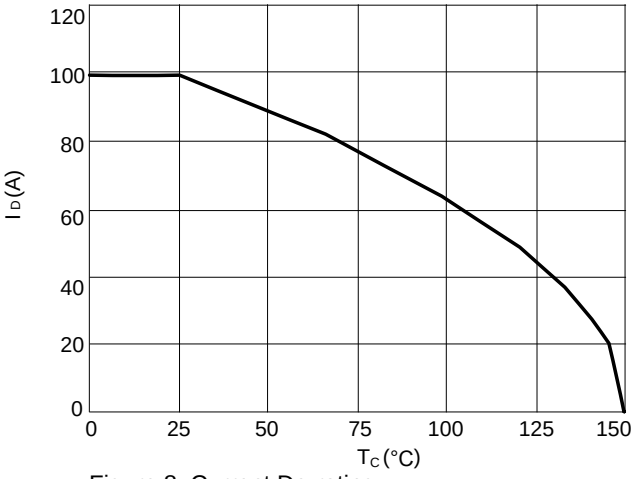


Figure 8: Current De-rating

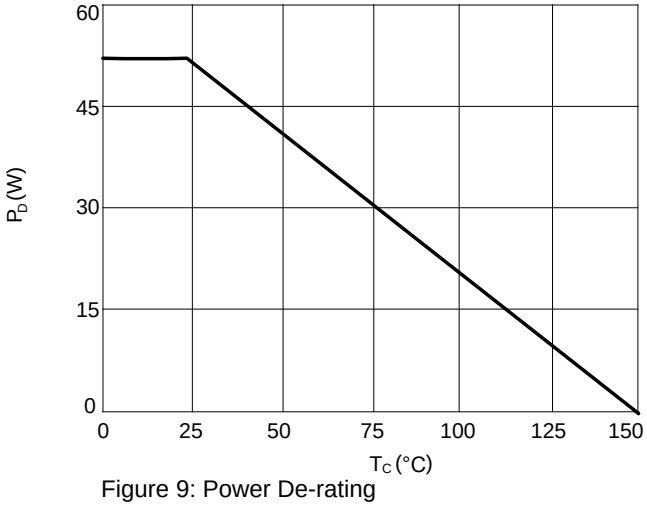


Figure 9: Power De-rating

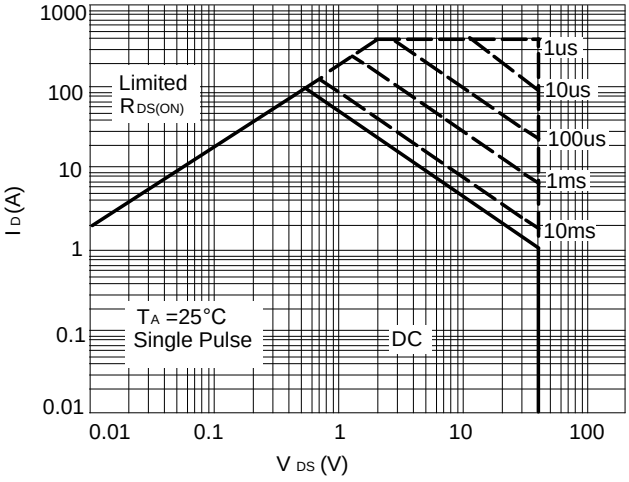
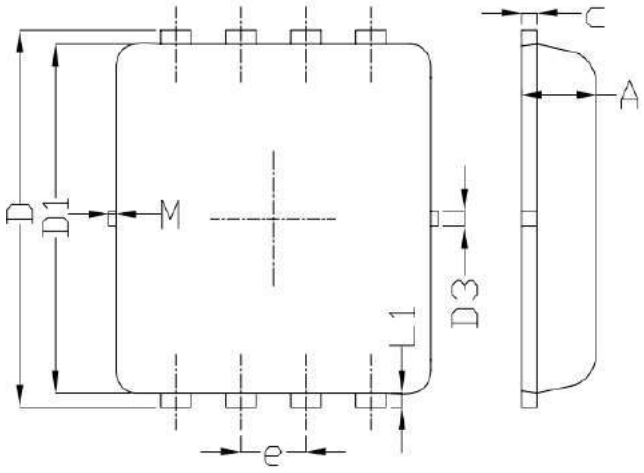
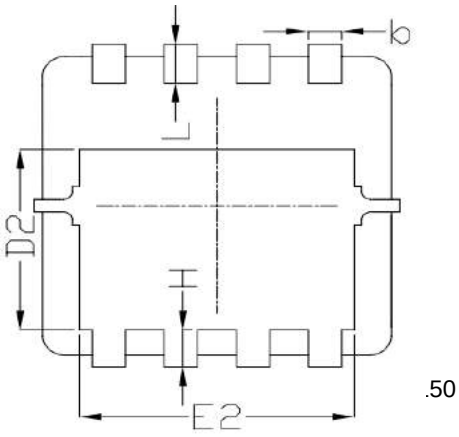


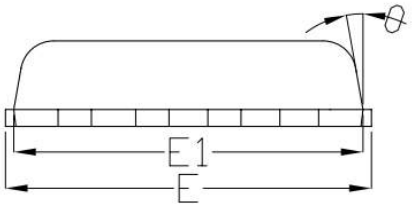
Figure 10: Safe Operating Area

■ PDFN3X3 PACKAGE OUTLINE DIMENSIONS

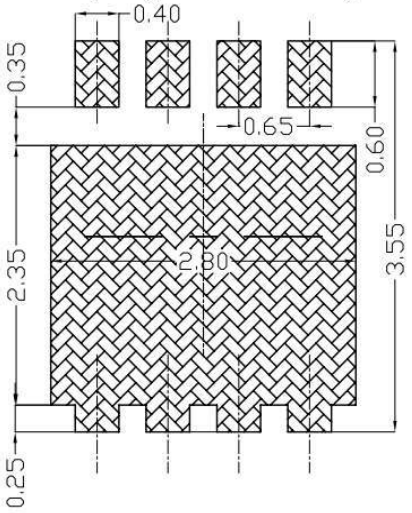




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Land Pattern
(Only for Reference)



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			