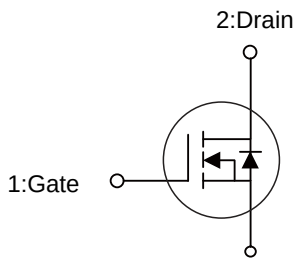
■ PRODUCT CHARACTERISTICS

V_{DSS}	40V
$R_{DS(ON)}$ Typ(@V_{GS}=10V)	8mΩ
$R_{DS(ON)}$ Typ(@V_{GS}=4.5V)	11mΩ
I_D	50A

Symbol



■ APPLICATIONS

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

TO-252

■ FEATURE

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

■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT50N04D	TO-252	2500 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	50	A
Drain Current Pulsed	I_{DM}	200	A
Avalanche Energy *	E_{AS}	121	mJ
Power Dissipation	P_D	48	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}	2.6	°C/W

Note: * EAS condition: T_J=25°C ,V_{DD}=30V ,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	-	8	10	mΩ
		V_{GS}=4.5V,I_D=20A	-	11	15	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	1	1.8	2.5	V
Dynamic characteristics						
Gate Resistance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	2.6	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=10V,I_D=3A	-	10	-	S
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V f=1.0MHz	-	1900	-	pF
Output Capacitance	C_{oss}		-	108	-	pF
Reverse Transfer Capacitance	C_{rss}		-	95	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	I_D=20A, V_{DS}=20V R_G=3Ω ,V_{GS}=10V	-	10	-	ns
Rise Time	t_r		-	28	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	40	-	ns
Fall Time	t_f		-	7	-	ns
Total Gate Charge	Q_g	I_D=20A, V_{DS}=20V V_{GS}=10V	-	48	-	nC
Gate to Source Charge	Q_{gs}		-	10	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	11	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	50	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	200	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 dI/dt=100A/μs	-	30	-	ns
Reverse Recovery Charge	Q_{rr}		-	42	-	nC

■ TYPICAL CHARACTERISTICS

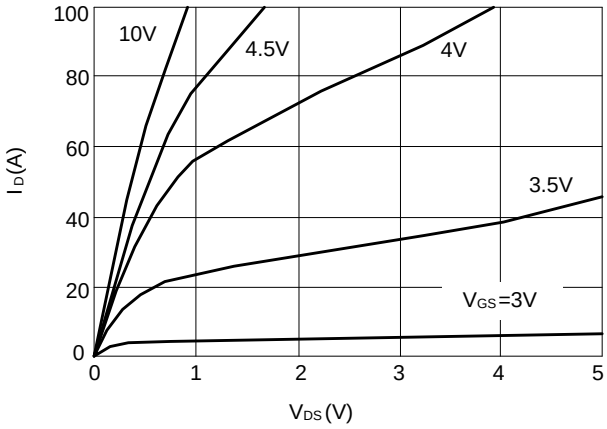


Figure 1: Output characterisatics

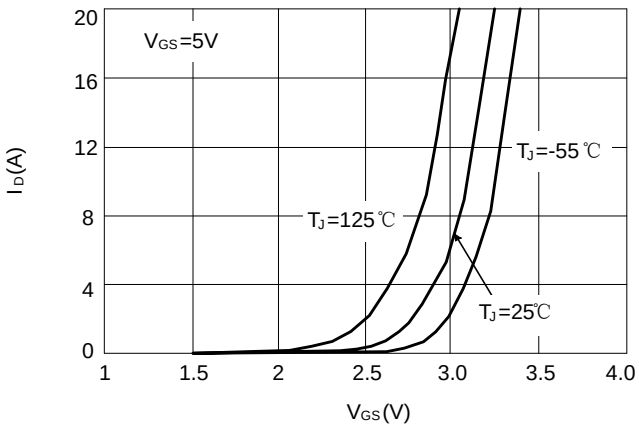


Figure 2: Transfer characterisatics

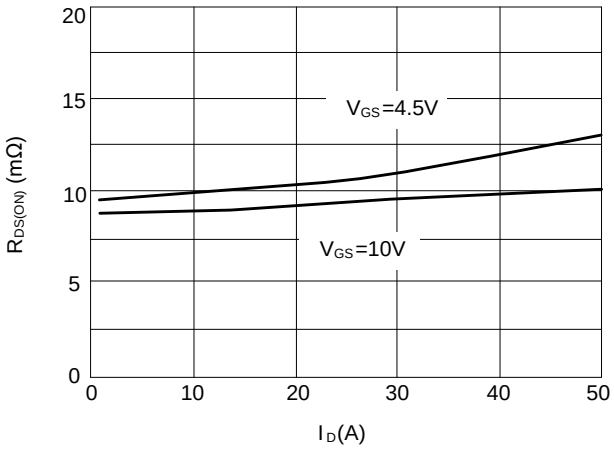


Figure 3: On-resistance vs. drain curret

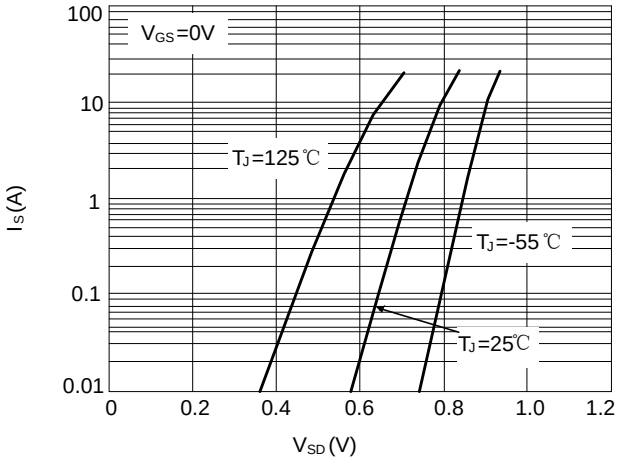


Figure 4: Body diode characteristics

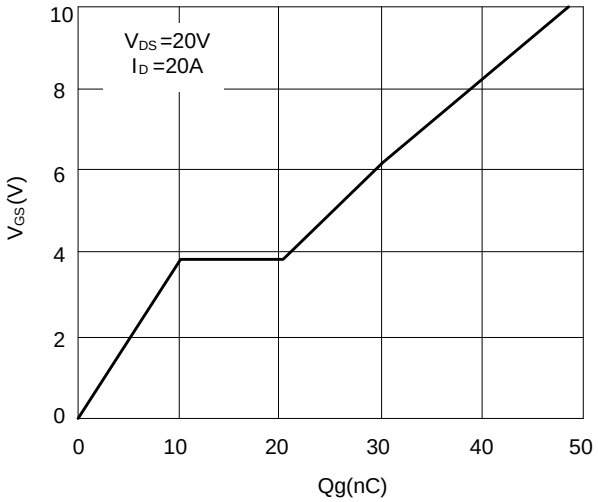


Figure 5: Gate charge characteristics

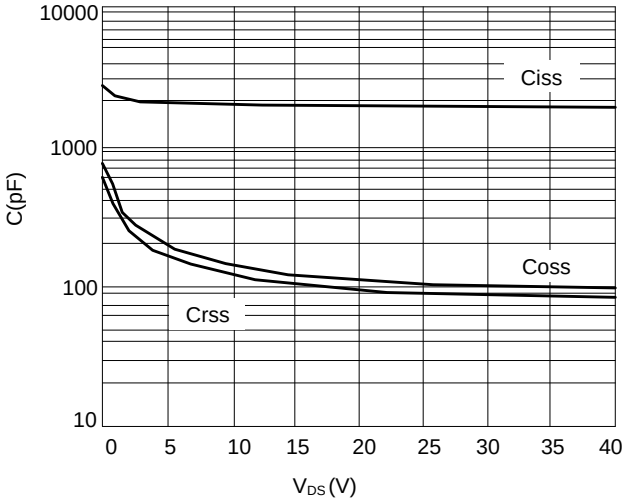


Figure 6: Capacitance characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

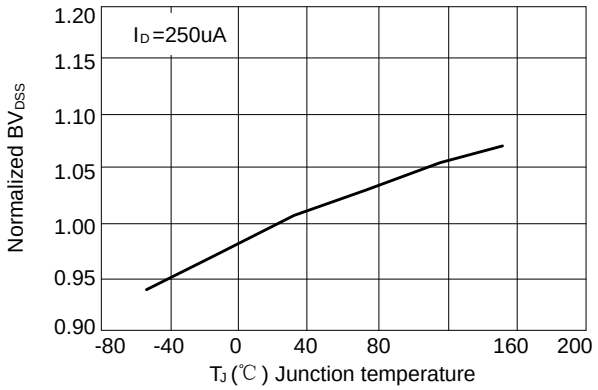


Figure 7: Normalized breakdown voltage vs junction temperature

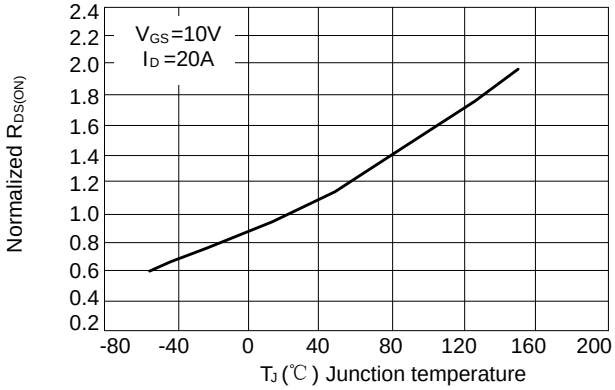


Figure 8: Normalized on-resistance vs. junction temperature

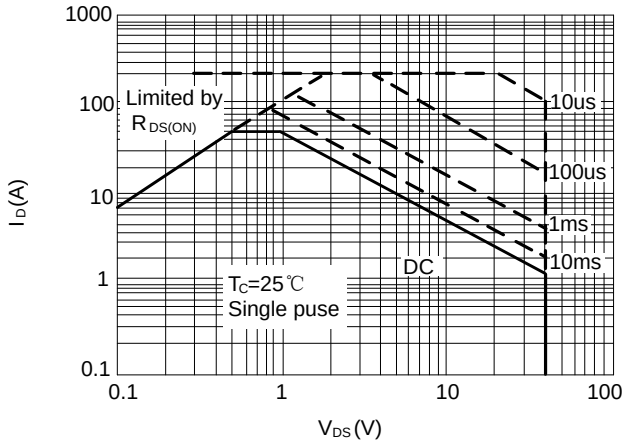


Figure 9 : Safe operating area

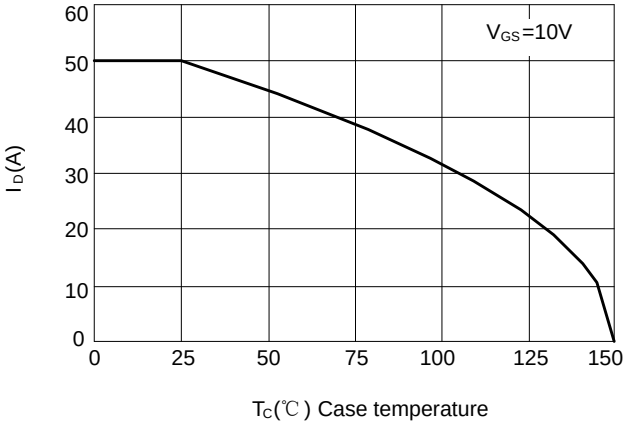


Figure 10: Maximum continious drain current vs case temperature

■ TO-252 PACKAGE OUTLINE DIMENSIONS