

PRODUCT CHARACTERISTICS

V_{DS}	40V
$R_{DS(ON)}$ Typ(@ $V_{GS}=10V$)	1.9m Ω
$R_{DS(ON)}$ Typ(@ $V_{GS}=4.5V$)	3.2m Ω
I_D	165A

APPLICATIONS

- * Motor Control
- * High Performance SMPS
- * DC/DC Converter

FEATURE

- * Low Gate Charge
- * Ultra-low $R_{DS(ON)}$

ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4120D	TO-252	2500 pieces/Reel

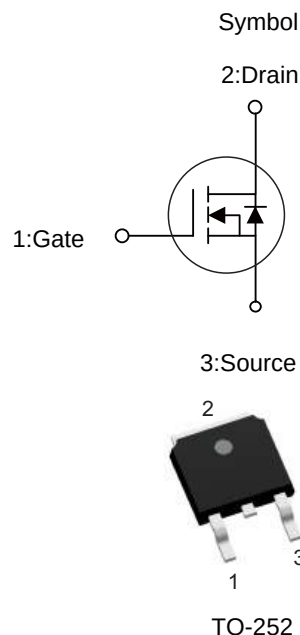
ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current Continuous(@ $V_{GS}=10V$, $T_A=25^{\circ}C$)	I_D	165	A
Drain Current Pulsed	I_{DM}	660	A
Avalanche Energy *	E_{AS}	576	mJ
Power Dissipation	P_D	130	W
Junction Temperature	T_J	+175	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +175	$^{\circ}C$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	1.15	$^{\circ}C/W$

Note: * EAS condition: $T_J=25^{\circ}C$, $V_{DD}=24V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$



■ ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, 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	-	1.9	2.6	mΩ
		V _{GS} =4.5V, I _D =20A	-	3.2	4	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1	1.6	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 =3 A	-	17	-	S
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V f=1.0MHz	-	5500	-	pF
Output Capacitance	C _{oss}		-	514	-	pF
Reverse Transfer Capacitance	C _{rss}		-	458	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	I _D =20A, V _{DS} =20V R _G =6Ω ,V _{GS} =10V	-	15	-	ns
Rise Time	t _r		-	70	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	80	-	ns
Fall Time	t _f		-	30	-	ns
Total Gate Charge	Q _g	I _D =20A, V _{DS} =20V V _{GS} =10V	-	155	-	nC
Gate to Source Charge	Q _{gs}		-	15	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	42	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _s		-	-	165	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	660	A
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.73	1.2	V
Reverse Recovery Time	t _{rr}	I _{SD} =20A, T _J =25 °C	-	52	-	ns
Reverse Recovery Charge	Q _{rr}	dI /dt=100A/μs	-	64	-	nC

TYPICAL CHARACTERISTICS

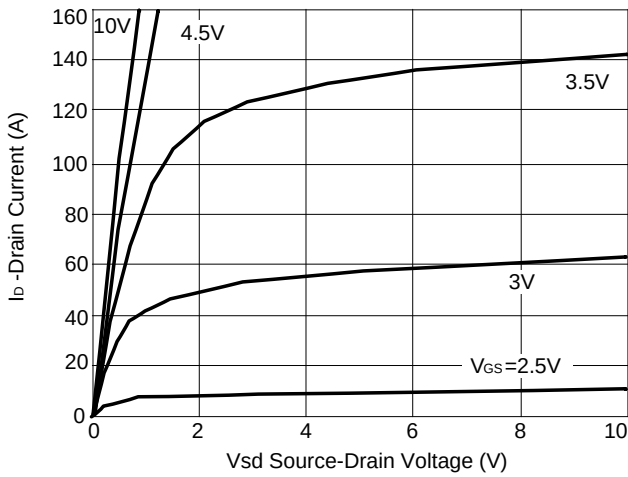


Figure 1: Output Characteristics

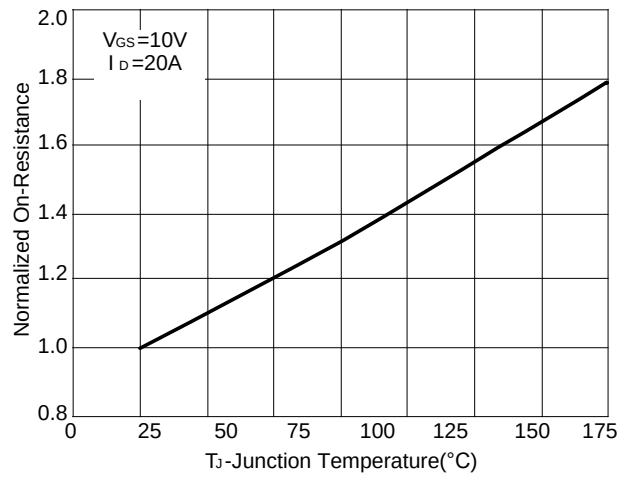


Figure 2: Rdson-Junction Temperature

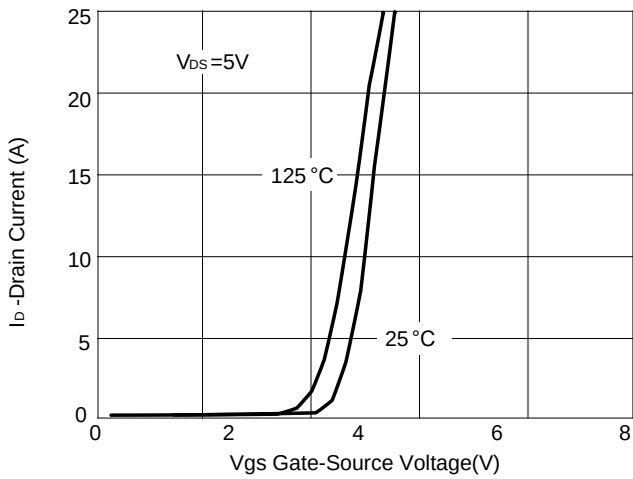


Figure 3: Transfer Characteristics

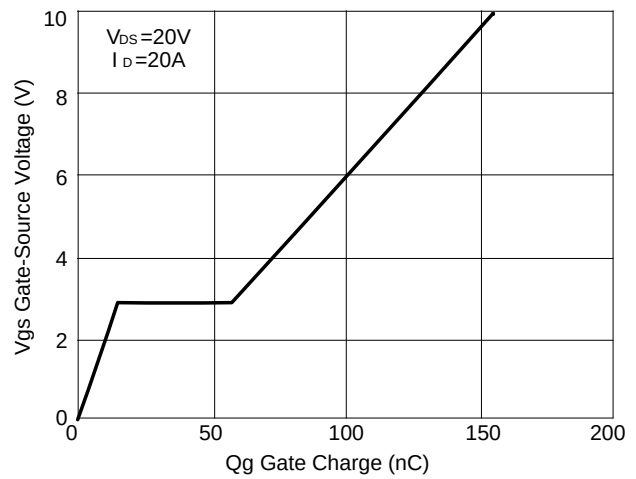


Figure 4: Gate Charge

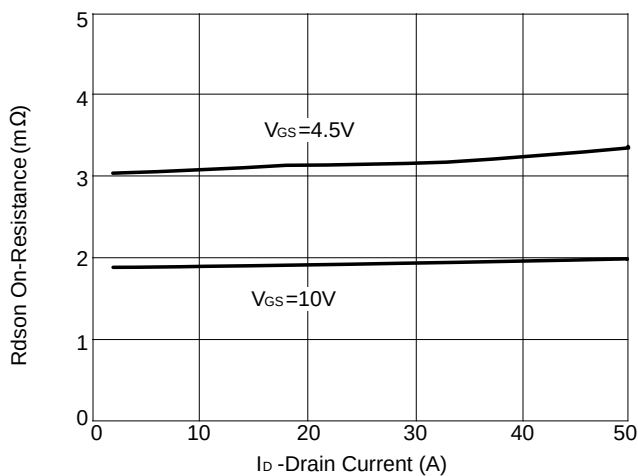


Figure 5: Rdson-Drain Current

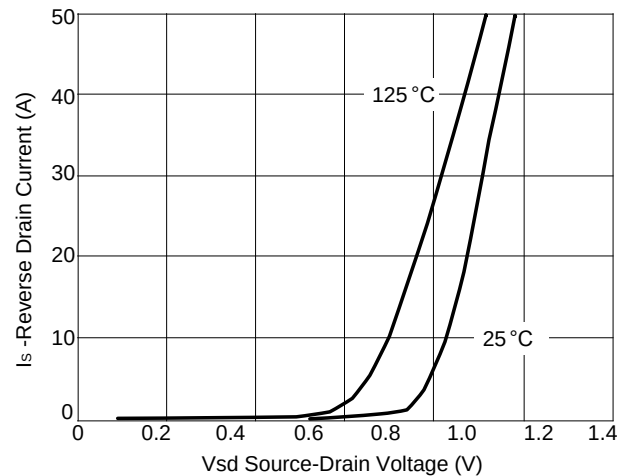


Figure 6: Source-Drain Diode Forward

■ TYPICAL CHARACTERISTICS(Cont.)

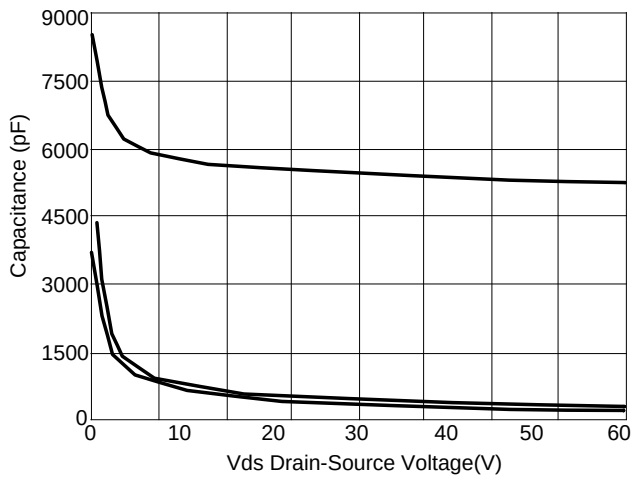


Figure 7: Capacitance vs vds

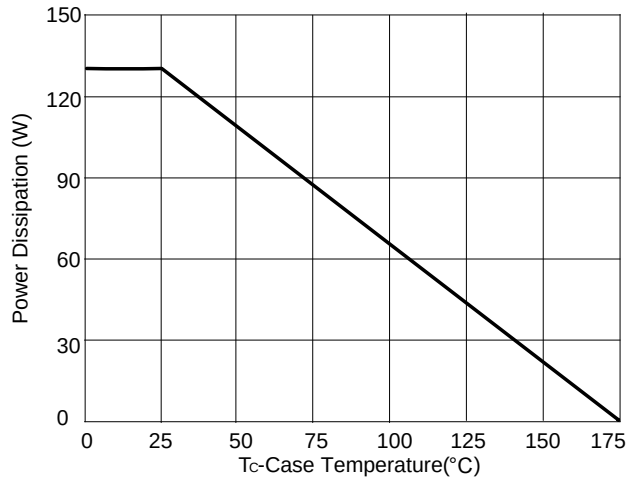


Figure 8: Power De-rating

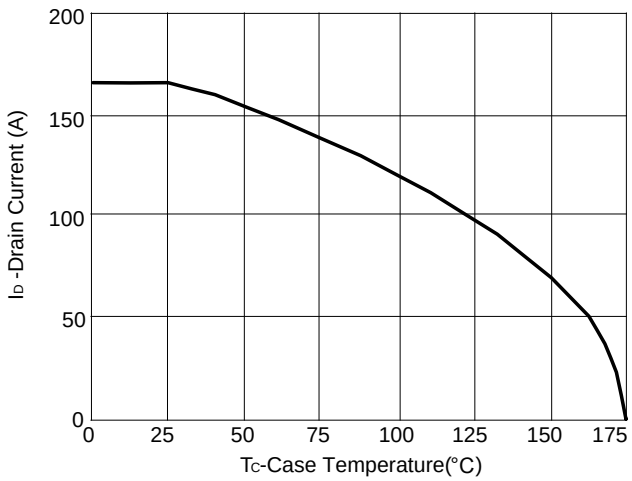


Figure 9: Current De-rating

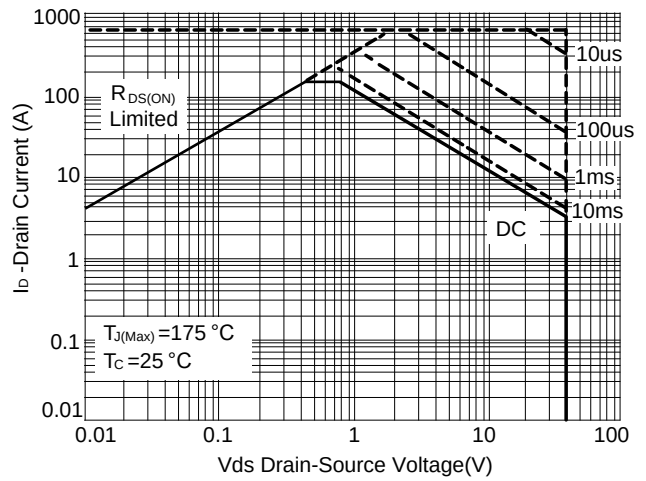


Figure 10: Safe Operation Area

■ TO-252 PACKAGE OUTLINE DIMENSIONS

