

PRODUCT CHARACTERISTICS

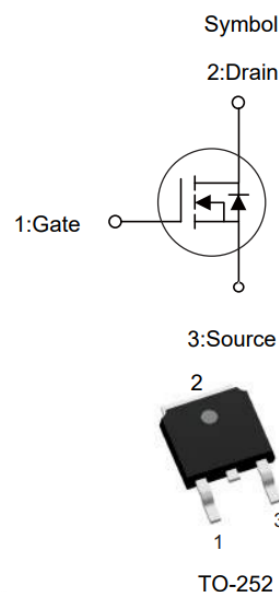
V_{DS}	40V
$R_{DS(ON)}$ Typ(@ $V_{GS}=10V$)	2.9m Ω
I_D	120A

FEATURE

- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

APPLICATIONS

- Portable Equipment and Battery Powered systems.
- Power Management in Notebook Computer



ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4133HD	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	120	A
Drain Current Continuous(@ $V_{GS}=10V, T_A=100^{\circ}C$)	I_D	85	A
Drain Current Pulsed	I_{DM}	480	A
Avalanche Energy *	E_{AS}	756	mJ
Power Dissipation	P_D	90	W
Junction Temperature	T_J	+150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	1.39	$^{\circ}C/W$

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 _{GS} =+20V, V _{DS} =0V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS(R)}	V _{GS} =-20V , V _{DS} =0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	R _{DS(ON)}	V _{GS} =10V,I _D =20A	-	2.9	3.3	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	2.0	2.8	4.0	V
Dynamic characteristics						
Gate capacitance	R _g	V _{GS} =0V,V _{DS} =0V ,f=1.0MHz	-	1.4	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =5V,I _D =5A	-	13	-	S
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V f=1.0MHz	-	5300	-	pF
Output Capacitance	C _{oss}		-	570	-	pF
Reverse Transfer Capacitance	C _{rss}		-	393	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =10V, V _{DS} =20V, I _D =10A ,R _G =3Ω	-	13	-	ns
Rise Time	t _r		-	18	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	52	-	ns
Fall Time	t _f		-	23	-	ns
Total Gate Charge	Q _g	I _D =10A, V _{DS} =20V V _{GS} =10V	-	114	-	nC
Gate to Source Charge	Q _{gs}		-	32	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	25	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _s		-	-	120	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	480	A
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.69	1.2	V
Reverse Recovery Time	t _{rr}	I _{SD} =20A, T _J =25℃ dI/dt=100A/μs	-	42	-	ns
Reverse Recovery Charge	Q _{rr}		-	45	-	nC

■ TYPICAL CHARACTERISTICS

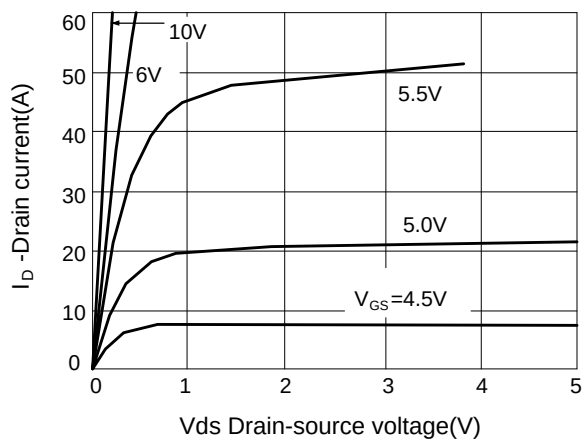


Figure 1: Output characteristics

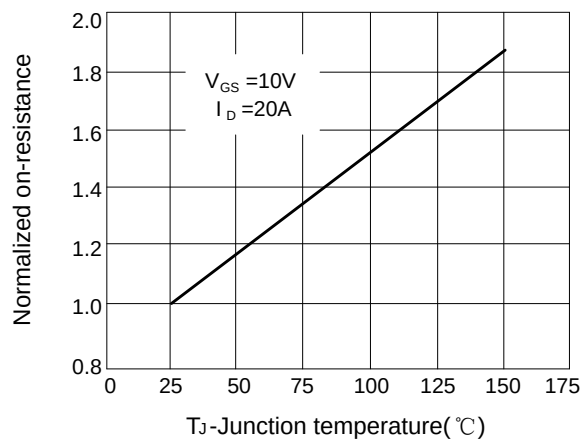


Figure 2: Rdson-junction temperature

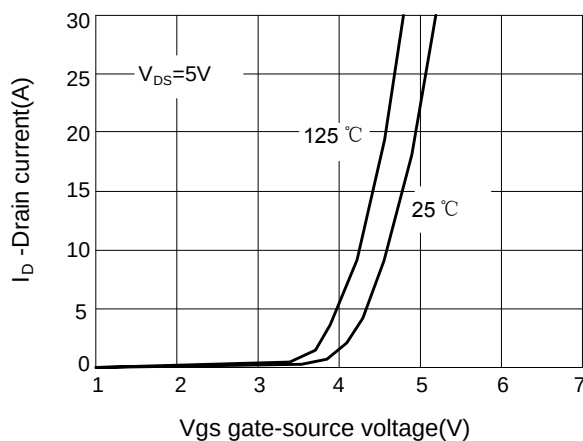


Figure 3: Transfer characteristics

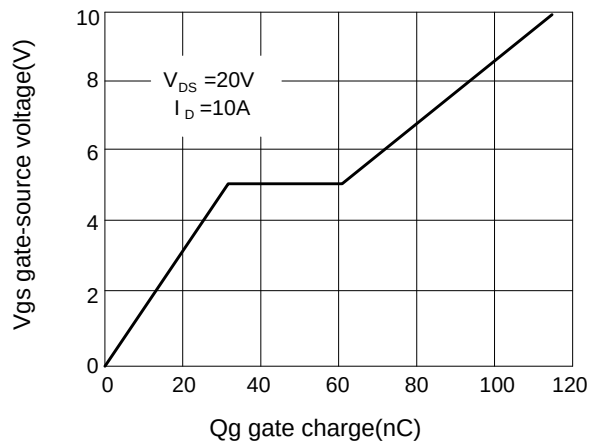


Figure 4: Gate charge

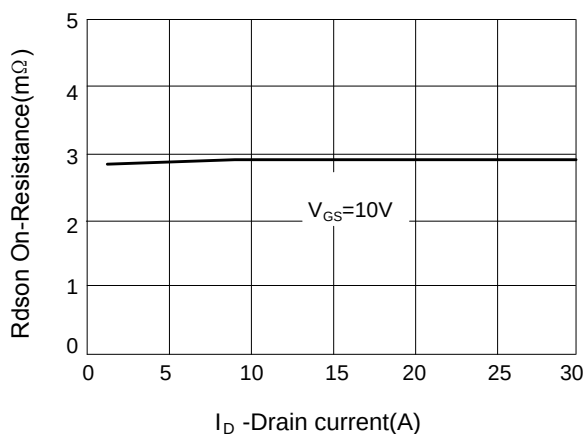


Figure 5: Rdson-drain current

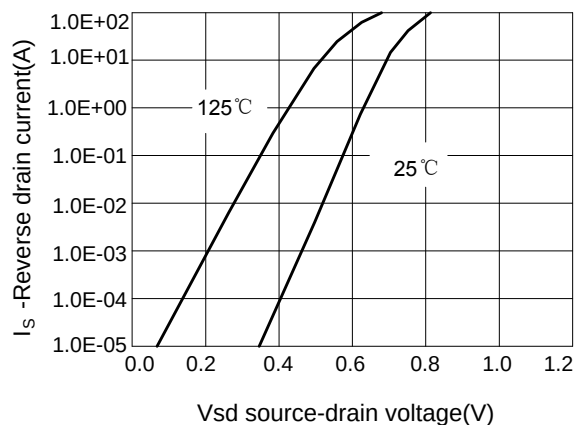


Figure 6: Source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

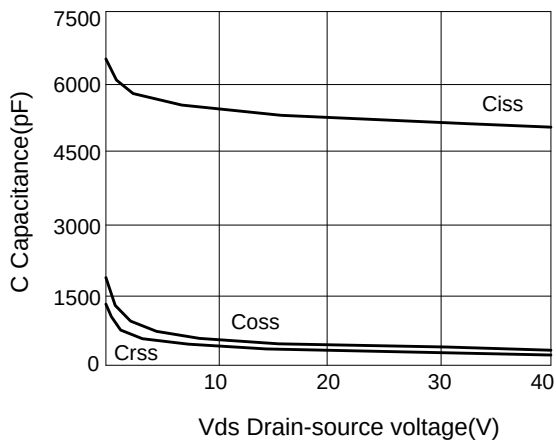


Figure 7: Capacitance vs vds

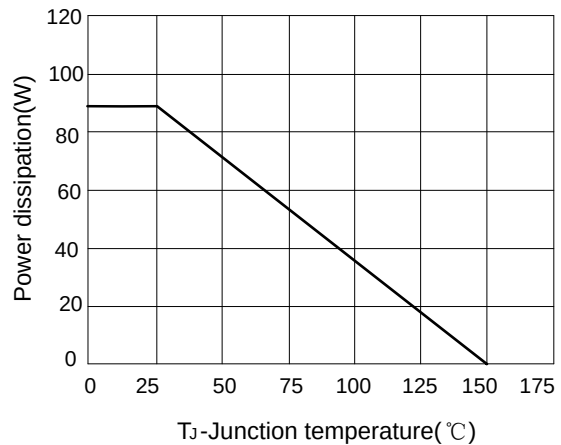


Figure 8: Power de-rating

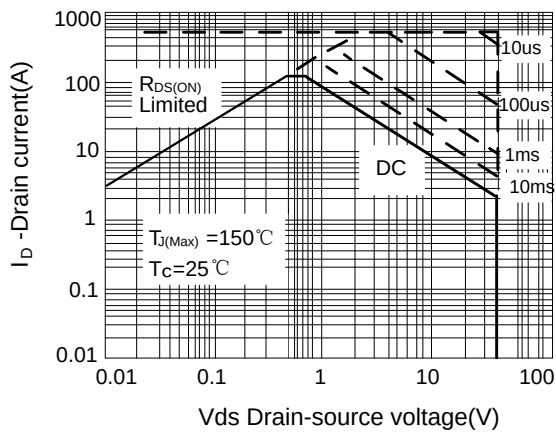


Figure 9: Safe operation area

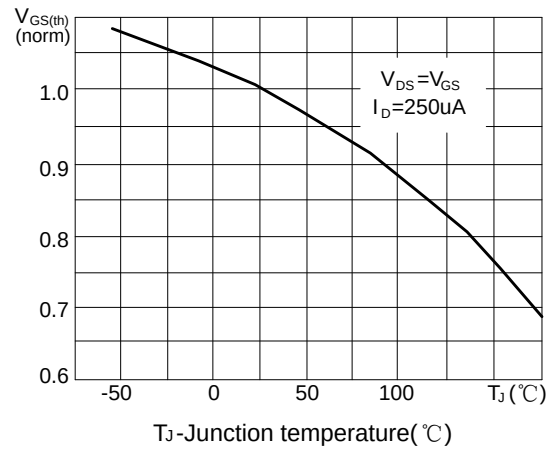


Figure 10: Power de-rating

Technical drawing of a mechanical part, showing front and side views with dimensions.

Front View Dimensions:

- Top edge: 1.0 ± 0.15
- Top edge: 0.05 ± 0.05
- Top edge: 5.33 ± 0.20
- Top edge: 1.78 ± 0.2
- Left side: 6.6
- Left side: 0.8 ± 0.2
- Left side: 0.76 ± 0.10 (with -0.02 tolerance)
- Bottom edge: 2.286
- Bottom edge: 0.840 ± 0.1
- Right side: 6.1 ± 0.1
- Internal feature: 1.2 ± 0.1 (with $+0.10$ and -0.05 tolerances)
- Internal feature: $R1.438$

Side View Dimensions:

- Top edge: 1.062 ± 0.35 (with -0.1 tolerance)
- Top edge: 2.3 ± 0.15
- Top edge: 0.5
- Internal feature: 7.0°
- Left side: 10.2 ± 0.3
- Left side: 3.1 ± 0.3
- Right side: $0 \sim 0.15$
- Right side: $0 \sim 5^\circ$
- Bottom edge: 0.5 ± 0.1 (with 0 tolerance)
- Bottom edge: 1.65