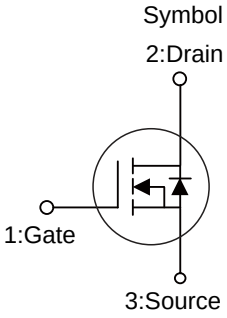
■ PRODUCT CHARACTERISTICS

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

Symbol



■ APPLICATIONS

* Electronic lamp ballasts based on half bridge
* Load Switching,Quick/Wirelss Charge.
* Motor Driving



TO-220F

■ FEATURE

* Low Gate Charge
* Pb-Free Lead Plating

■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4133HF	TO-220F	50 pieces/Tube

■ 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	120	A
Drain Current Continuous(@V_{GS}=10V ,T_A=100°C)	I_D	85	A
Drain Current Pulsed	I_{DM}	480	A
Avalanche Energy *	E_{AS}	740	mJ
Power Dissipation	P_D	40	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}	3.13	°C/W

Note: * EAS condition: T_J=25°C ,V_{DS}=24V,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_{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	2.7	4	V
Dynamic characteristics						
Gate capacitance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	1	-	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}		-	479	-	pF
Reverse Transfer Capacitance	C_{rss}		-	402	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	V_{GS}=10V, V_{DS}=20V, I_D=10A ,R_G=1Ω	-	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=10 A, 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	-	0.71	1.2	V
Reverse Recovery Time	t_{rr}	I_{SD}=10A, T_J=25°C dI/dt=100A/μs	-	42	-	ns
Reverse Recovery Charge	Q_{rr}		-	45	-	nC

■ TYPICAL CHARACTERISTICS

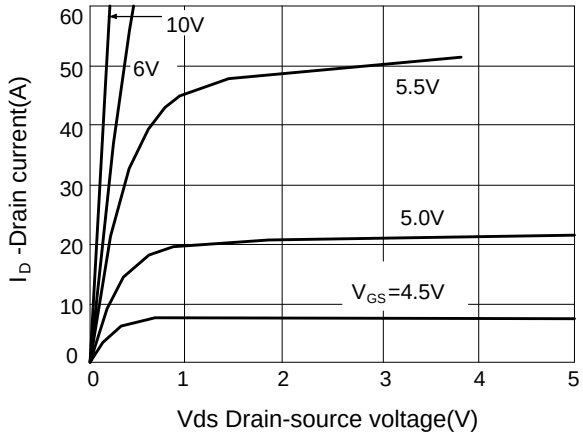


Figure 1: Output characteristics

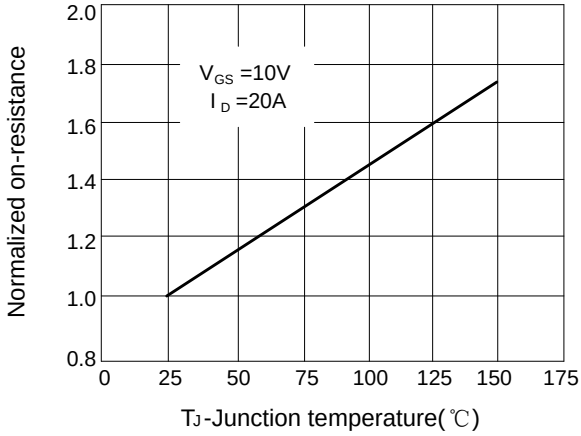


Figure 2: Rdson-junction temperature

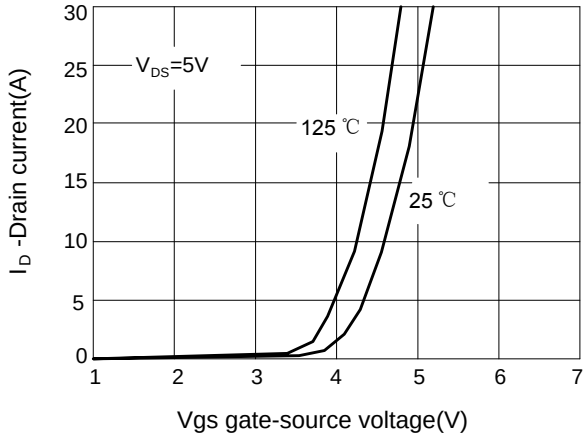


Figure 3: Transfer characteristics

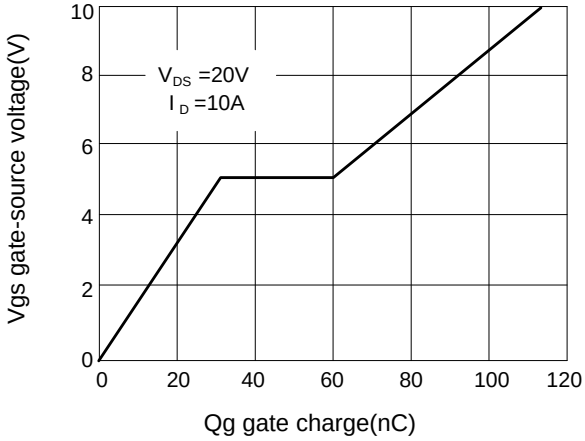


Figure 4: Gate charge

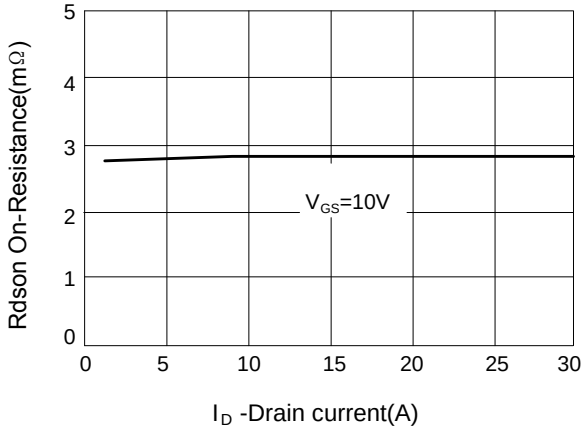


Figure 5: Rdson-drain current

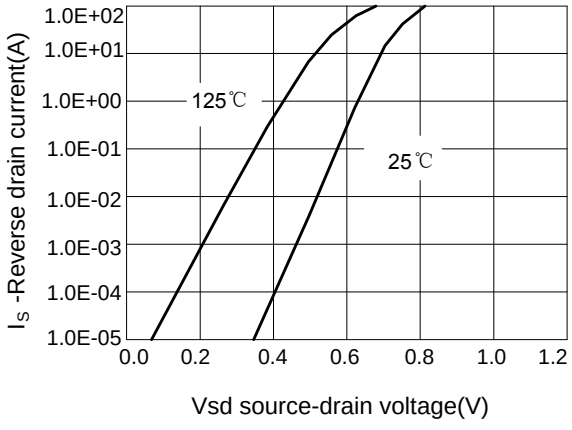


Figure 6: Source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

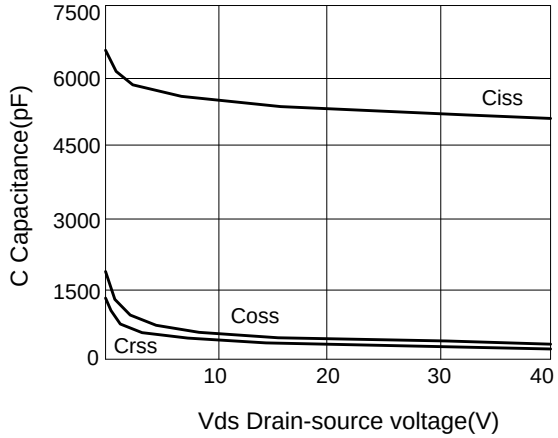


Figure 7: Capacitance vs vds

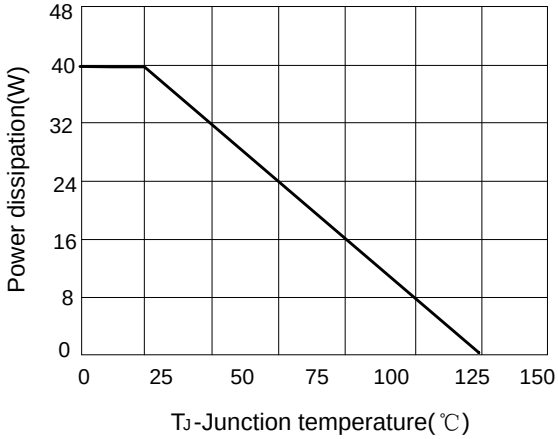


Figure 8: Power de-rating

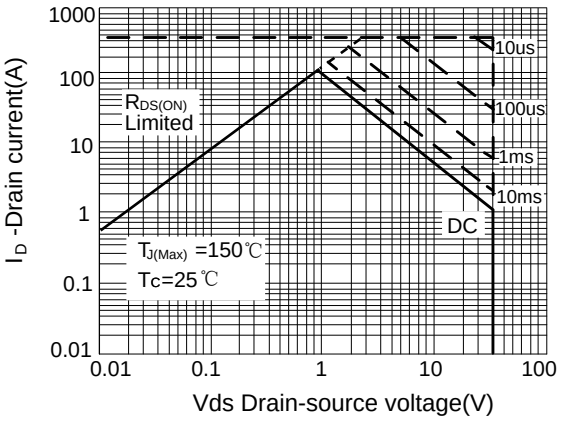


Figure 9: Safe operation area

■ TO-220F PACKAGE OUTLINE DIMENSIONS

