

PRODUCT CHARACTERISTICS

V_{DSS}	450V
$R_{DS(ON)}$ Typ(@ $V_{GS}=10V$)	0.54 Ω
Q_g @typ	43nC
I_D	12A

APPLICATIONS

- * High efficiency switch mode power supplies
- * Electronic lamp ballasts based on half bridge
- * LED power supplies

FEATURE

- * High Switching Speed
- * Improved dv/dt capability

ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4512F	TO-220F	50 pieces/Tube

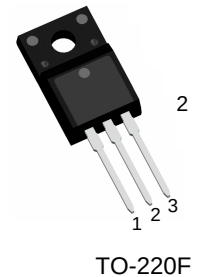
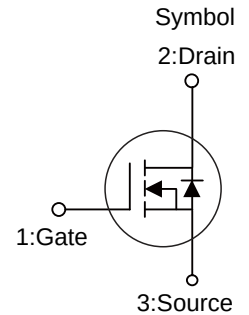
ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	450	V
Gate-Source Voltage	V_{GSS}	± 30	V
Drain Current Continuous(@ $V_{GS}=10V$, $T_A=25^{\circ}C$)	I_D	12	A
Drain Current Pulsed	I_{DM}	48	A
Avalanche Energy *	E_{AS}	720	mJ
Peak Diode Recovery dv/dt	dv/dt	5.0	V/ns
Power Dissipation	P_D	50	W
Junction Temperature	T_J	+150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Ambient	R_{thJA}	62.5	$^{\circ}C/W$
Junction to Case	R_{thJC}	2.5	$^{\circ}C/W$

Note: * EAS condition: $T_J=25^{\circ}C$, $V_{DD}=50V$, $V_G=10V$, $L=10mH$, $R_g=25\Omega$



■ 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	450	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =450V, V _{GS} =0V	-	-	1	μA
Gate to Source Forward Leakage	I _{GSS(F)}	V _{DS} =0V, V _{GS} =+30V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS(R)}	V _{DS} =0V, V _{GS} =-30V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =6A	-	0.54	0.6	Ω
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
Dynamic characteristics						
Gate capacitance	R _g	V _{GS} =0V, V _{DS} =0V ,f=1.0MHz	-	2.5	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =2A	-	5	-	S
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V f=1.0MHz	-	797	-	pF
Output Capacitance	C _{oss}		-	118	-	pF
Reverse Transfer Capacitance	C _{rss}		-	1	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	I _D =12 A, V _{DS} =225V R _G =3 Ω ,V _{GS} =10V	-	24	-	ns
Rise Time	t _r		-	70	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	120	-	ns
Fall Time	t _f		-	75	-	ns
Total Gate Charge	Q _g	I _D =12 A, V _{DS} =225V V _{GS} =10V	-	43	-	nC
Gate to Source Charge	Q _{gs}		-	8	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	19	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _S		-	-	12	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	48	A
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.74	1.2	V
Reverse Recovery Time	t _{rr}	I _{SD} =12 A, T _J =25 °C	-	90	-	ns
Reverse Recovery Charge	Q _{rr}	dI/dt=100A/μs	-	1500	-	nC

■ TYPICAL CHARACTERISTICS

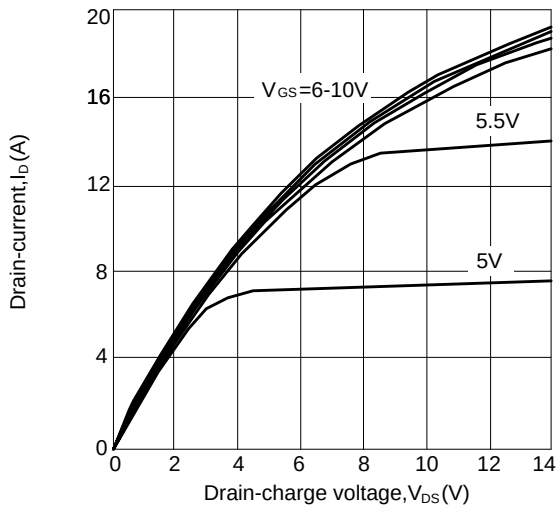


Figure 1: Drain current vs. drain-source voltage

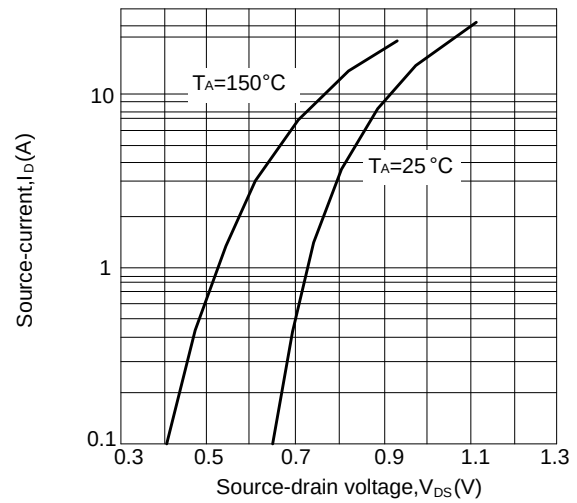


Figure 2: Source current vs. source-drain

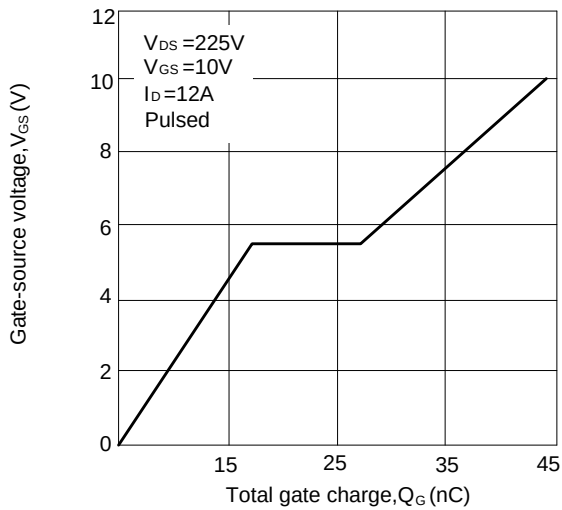


Figure 3: Gate charge characteristics

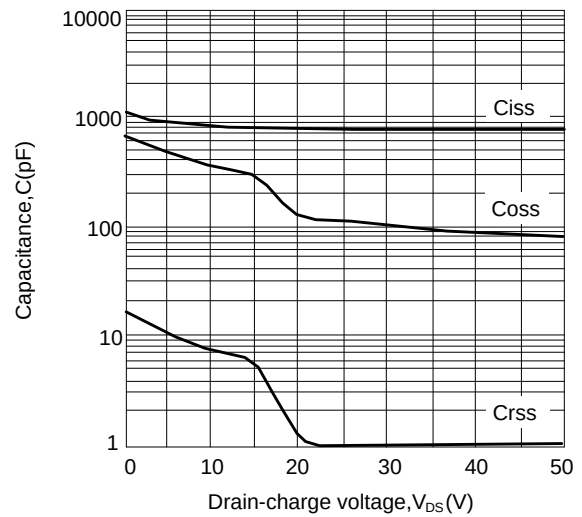


Figure 4: Capacitance characteristics

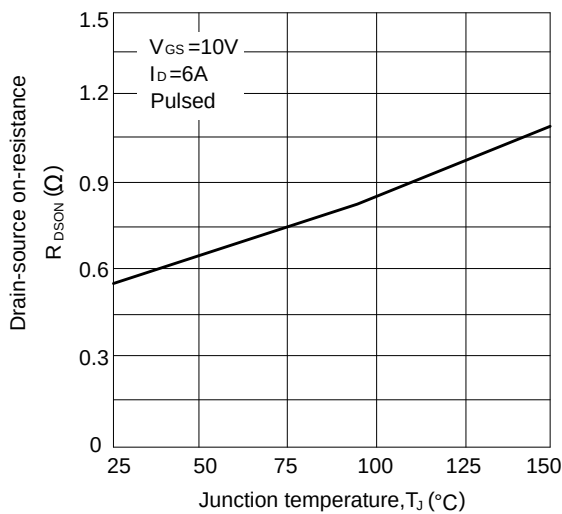


Figure 5: Drain-source on-resistance vs. junction temperature

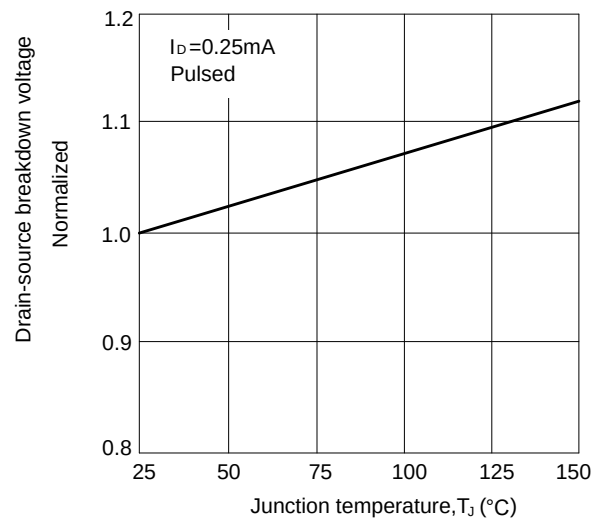


Figure 6: Breakdown voltage vs. junction temperature

TYPICAL CHARACTERISTICS(Cont.)

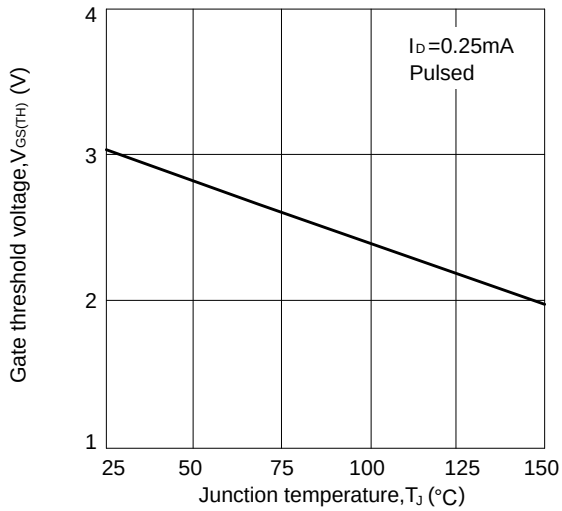


Figure 7: Gate threshold voltage vs junction temperature

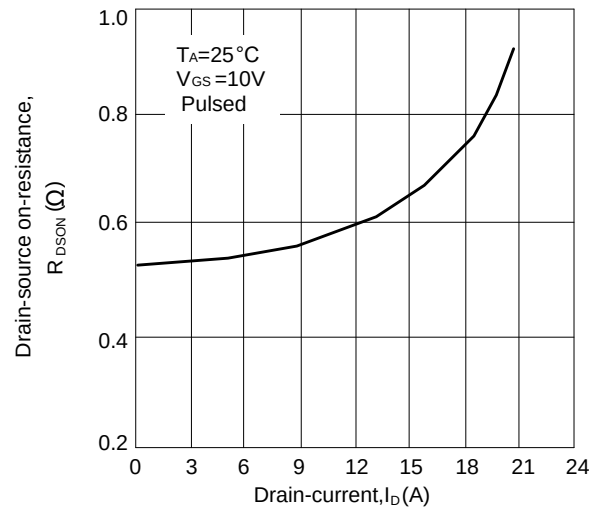


Figure 8: Drain-source on-resistance vs. drain-current

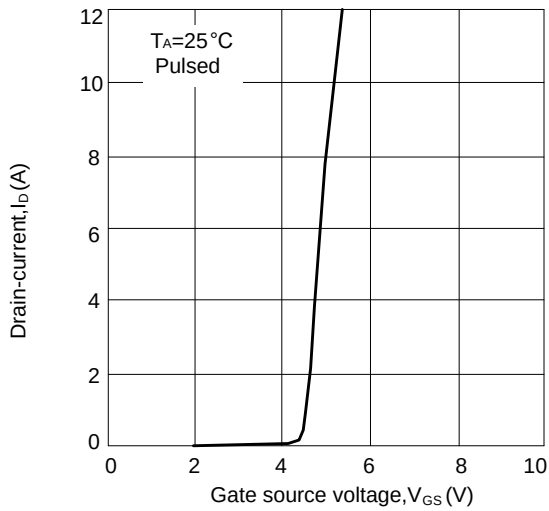


Figure 9: Drain-current vs. gate-source

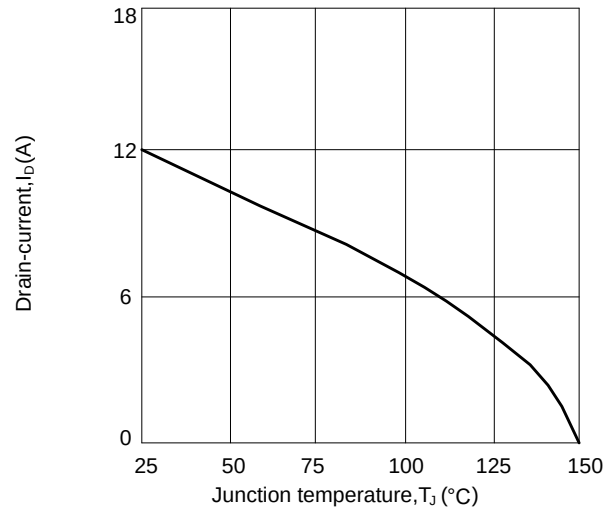


Figure 10: Drain current vs. junction temperature

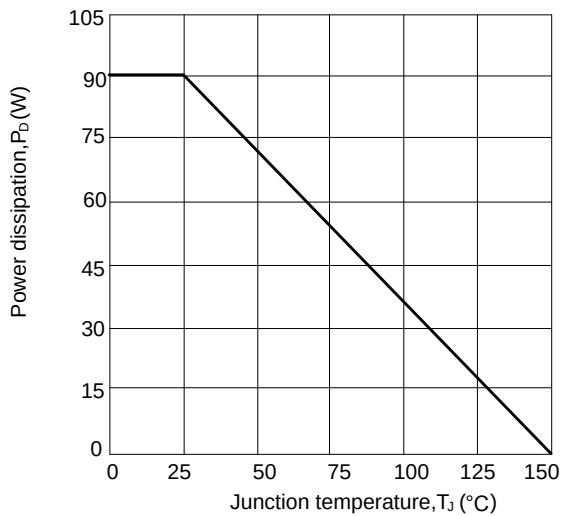


Figure 11: Power dissipation vs. junction temperature

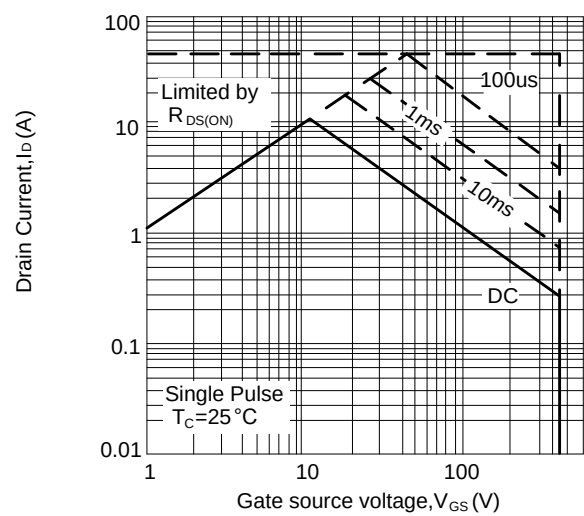


Figure 12: Safe operating area

■ TO-220F PACKAGE OUTLINE DIMENSIONS

