

PRODUCT CHARACTERISTICS

V_{DSS}	500V
$R_{DS(ON)}$ Typ(@ $V_{GS}=10V$)	0.35 Ω
Qg@typ	45nC
I_D	13A

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	MOT13N50F	TO-220F	50 pieces/Tube

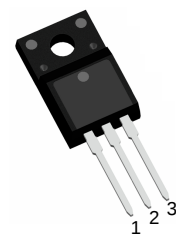
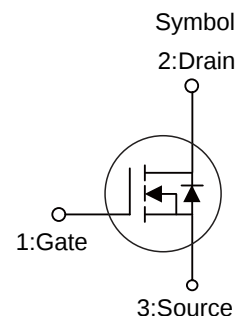
ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	500	V
Gate-Source Voltage	V_{GSS}	± 30	V
Drain Current Continuous(@ $V_{GS}=10V$, $T_A=25^{\circ}C$)	I_D	13	A
Drain Current Pulsed	I_{DM}	52	A
Avalanche Energy *	E_{AS}	1000	mJ
Peak Diode Recovery dv/dt	dv/dt	5.0	V/ns
Power Dissipation	P_D	40	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}	3.18	$^{\circ}C/W$

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



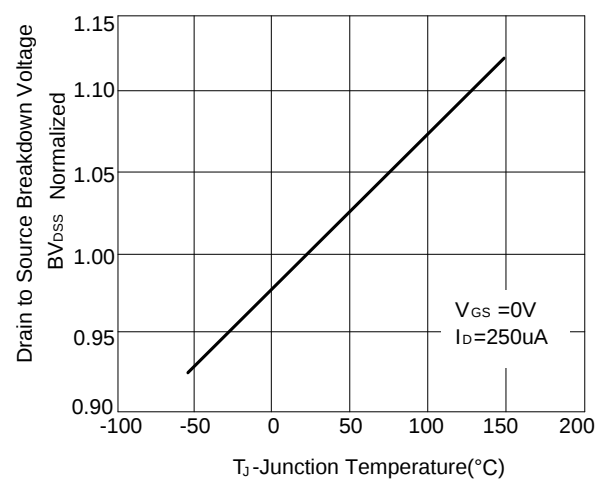
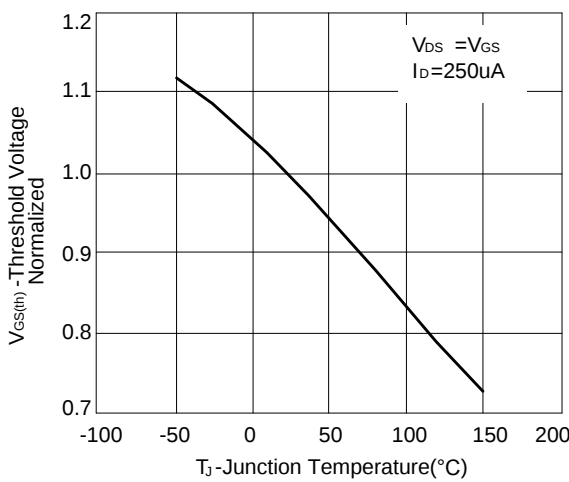
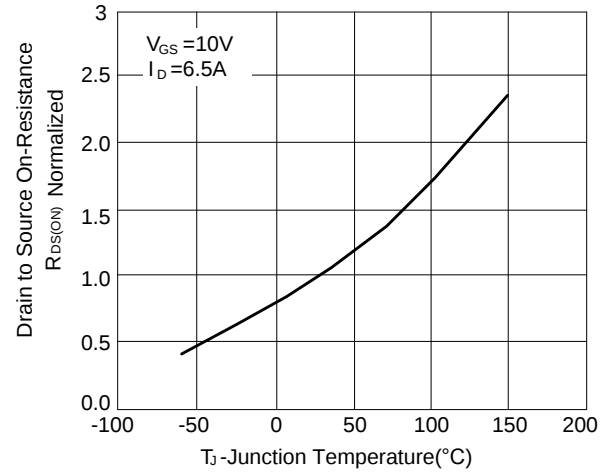
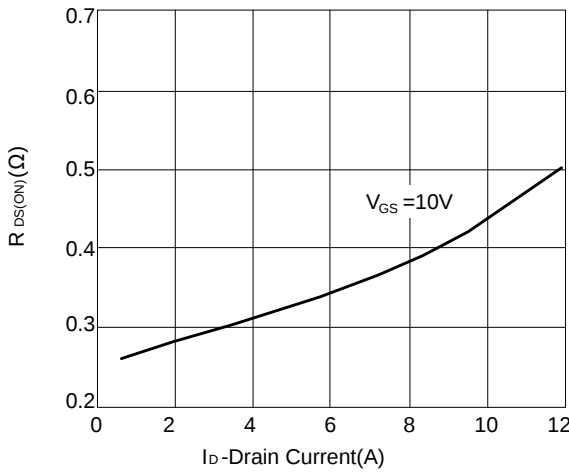
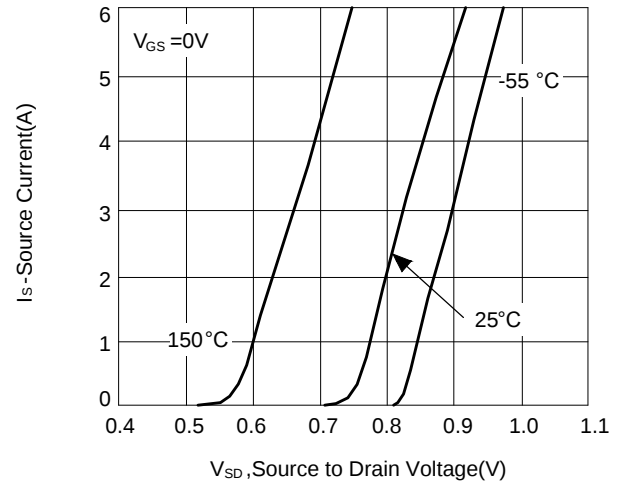
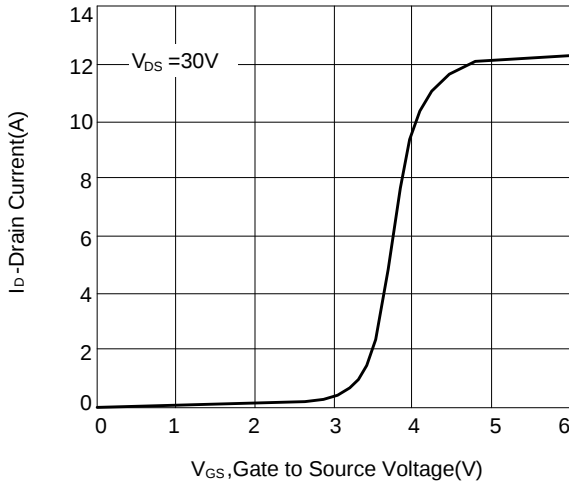
TO-220F



■ 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	500	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =500V, 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 =6.5A	-	0.35	0.45	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	-	2.7	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =3A	-	10	-	S
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V f=1.0MHz	-	2100	-	pF
Output Capacitance	C _{oss}		-	180	-	pF
Reverse Transfer Capacitance	C _{rss}		-	10	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	I _D =13 A, V _{DS} =250V R _G =6.1 Ω ,V _{GS} =10V	-	14	-	ns
Rise Time	t _r		-	27	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	45	-	ns
Fall Time	t _f		-	36	-	ns
Total Gate Charge	Q _g	I _D =13 A, V _{DS} =250V V _{GS} =10V	-	45	-	nC
Gate to Source Charge	Q _{gs}		-	10	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	18	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _s		-	-	13	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	52	A
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.72	1.2	V
Reverse Recovery Time	t _{rr}	I _{SD} =13A, T _J =25°C	-	506	-	ns
Reverse Recovery Charge	Q _{rr}	dI /dt=100A/μs	-	4200	-	nC

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)

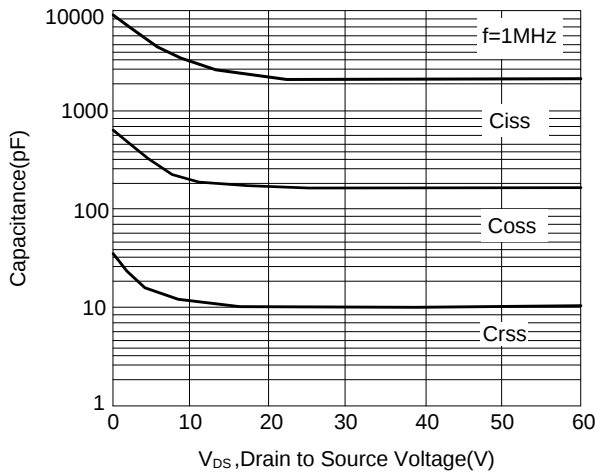


Figure 7: Capacitance vs Drain to Source Voltage

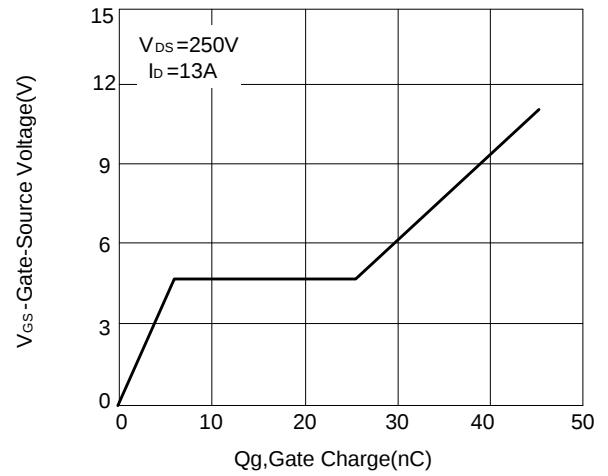


Figure 8: Gate Charge vs Gate to Source Voltage

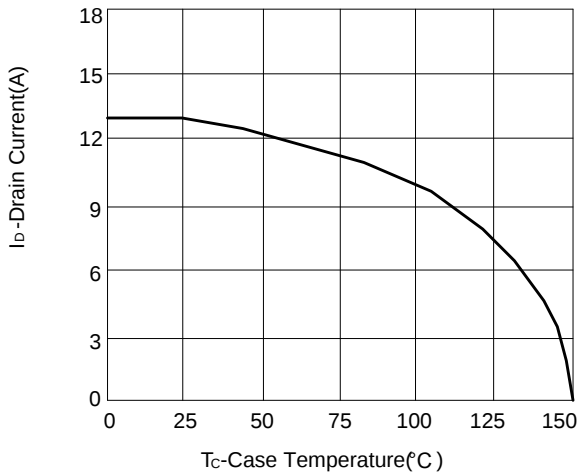


Figure 9: Continuous Drain vs Case Temperature

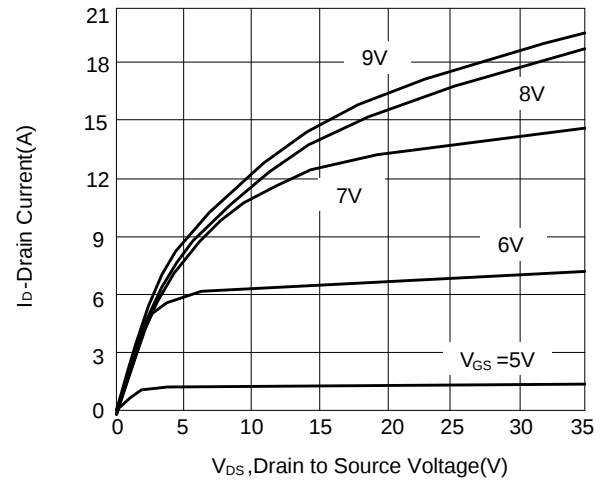


Figure 10: Output Characteristics

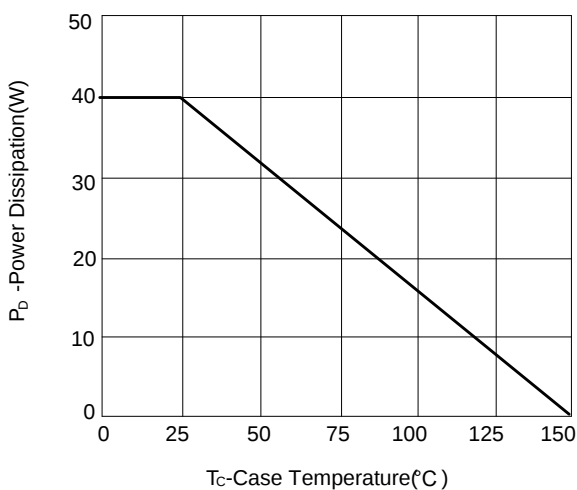


Figure 11: Power Dissipation vs Case Temperature

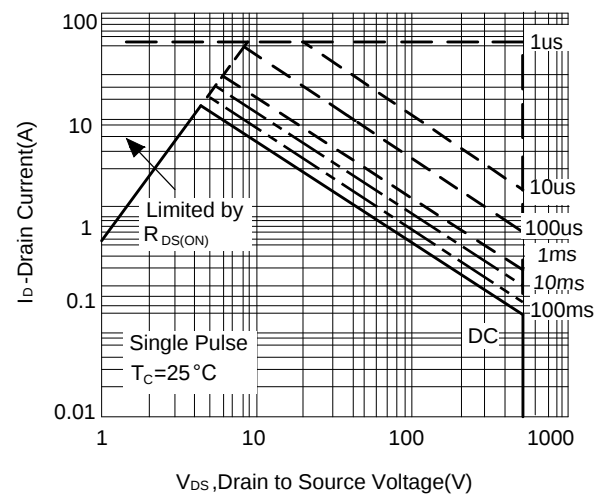


Figure 12: Safe operating Area

■ TO-220F PACKAGE OUTLINE DIMENSIONS

