

PRODUCT CHARACTERISTICS

V_{DSS}	500V
$R_{DS(ON)}$ Typ(@ $V_{GS}=10V$)	0.45 Ω
Qg@typ	42nC
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	MOT13N50EF	TO-220F	50 pieces/Tube

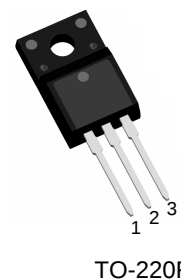
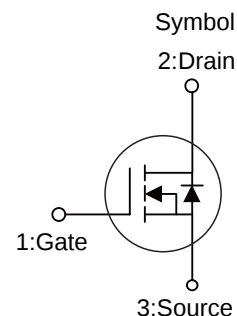
ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$, unless otherwise specified)

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	$^{\circ}C/W$

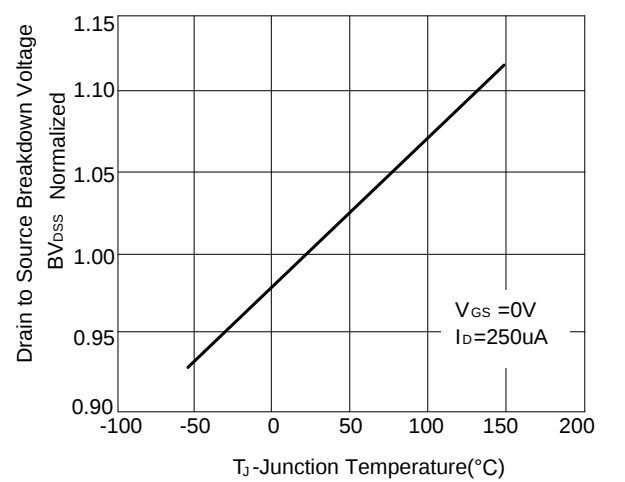
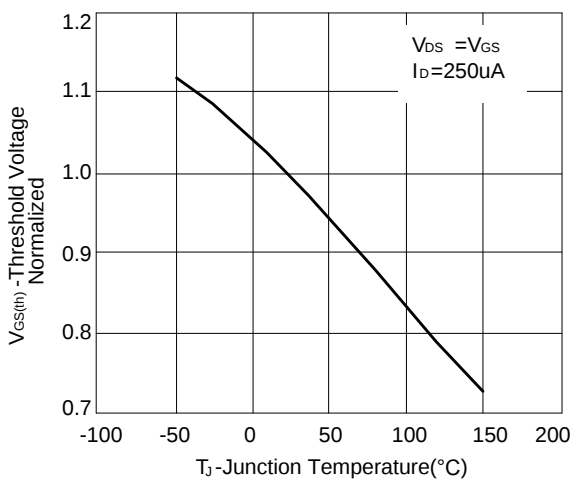
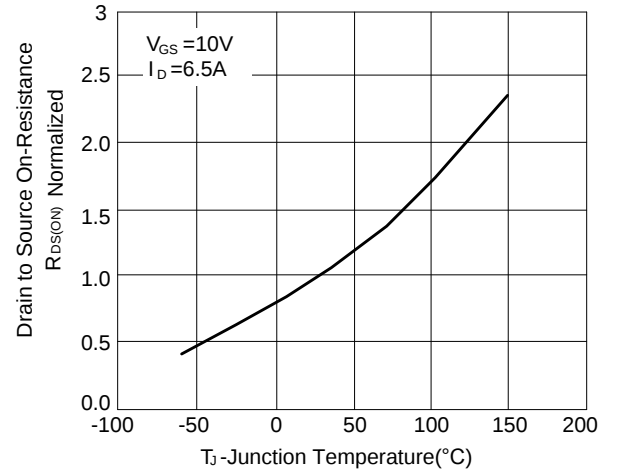
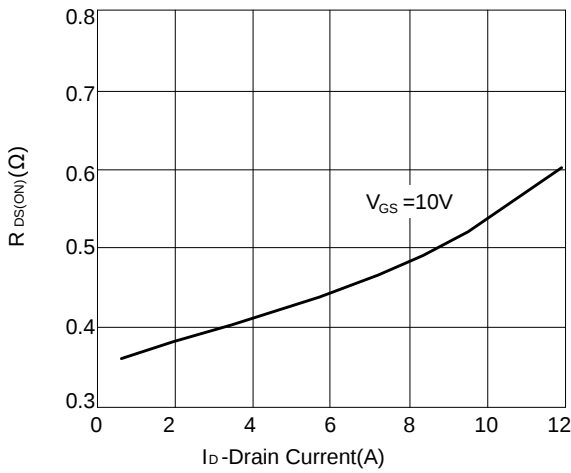
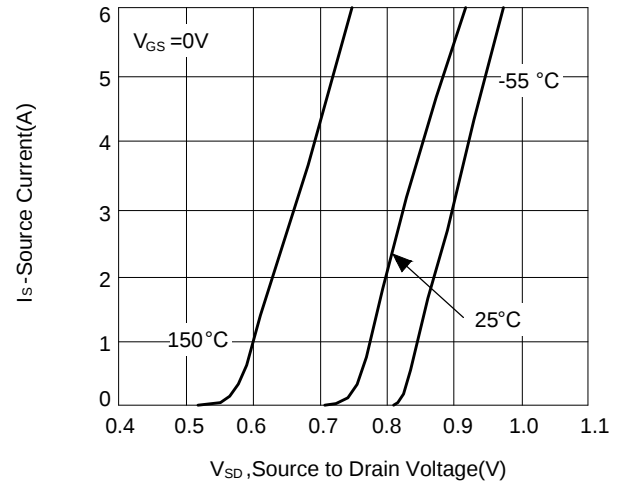
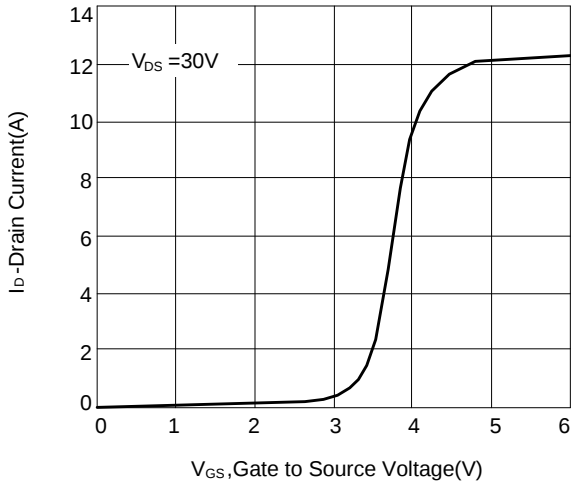
Note: * EAS condition: $T_J=25^{\circ}C$, $V_{DD}=50V$, $V_G=10V$, $L=10mH$, $R_g=25\Omega$



■ 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	-	0.45	0.5	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	-	6	-	S
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V f=1.0MHz	-	1400	-	pF
Output Capacitance	C _{oss}		-	147	-	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	-	12	-	ns
Rise Time	t _r		-	25	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	38	-	ns
Fall Time	t _f		-	30	-	ns
Total Gate Charge	Q _g	I _D =13 A, V _{DS} =250V V _{GS} =10V	-	42	-	nC
Gate to Source Charge	Q _{gs}		-	9	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	12	-	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	-	480	-	ns
Reverse Recovery Charge	Q _{rr}	di /dt=100A/μs	-	4000	-	nC

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)

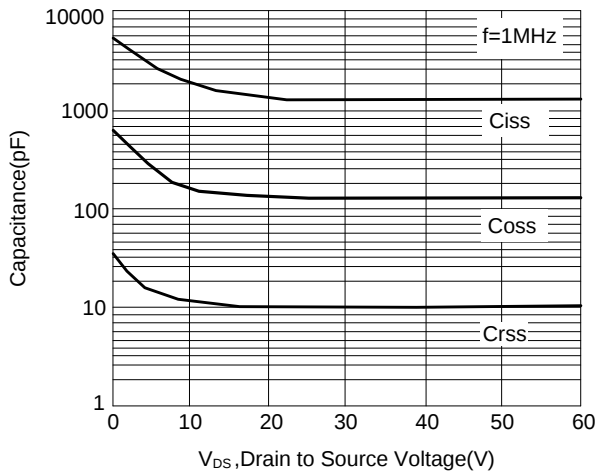


Figure 7: Capacitance vs Drain to Source Voltage

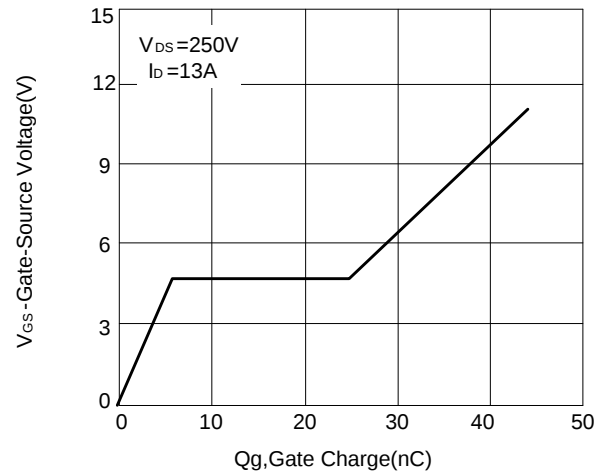


Figure 8: Gate Charge vs Gate to Source Voltage

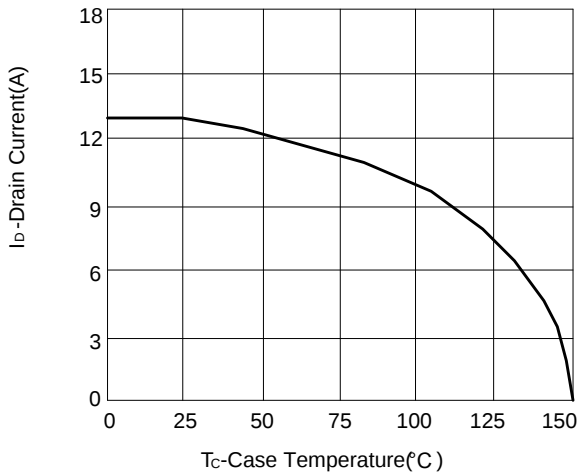


Figure 9: Continuous Drain vs Case Temperature

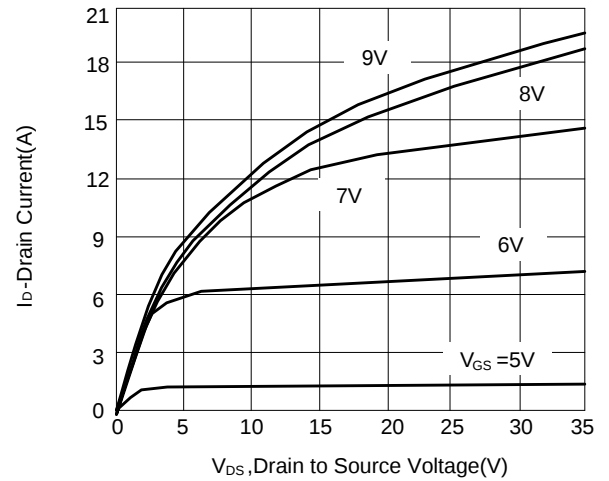


Figure 10: Output Characteristics

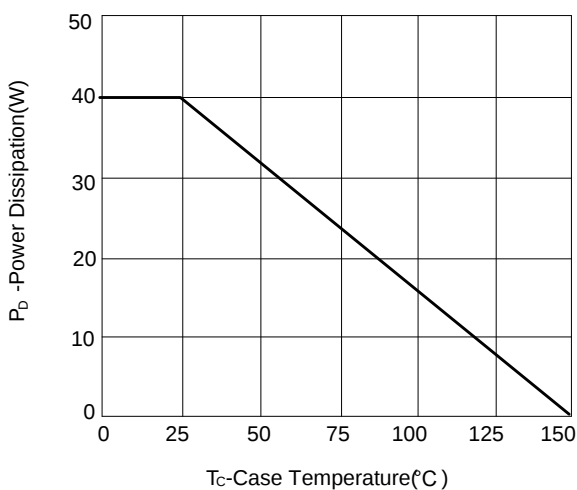


Figure 11: Power Dissipation vs Case Temperature

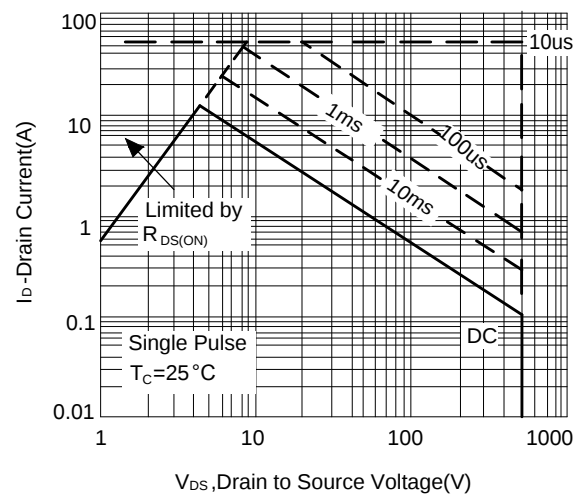


Figure 12: Safe operating Area

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

Front View Dimensions:

- Overall width: 10.06 ± 0.15
- Overall height: 15.87 ± 0.15
- Top flange width: 7.00 ± 0.15
- Top flange thickness: 3.30
- Central hole diameter: $3 - \phi 1.50$ (depth 0.15)
- Central hole diameter: 8.0
- Bottom flange width: 8.0
- Bottom flange thickness: 4.90
- Bottom flange radius: $R0.5$
- Bottom flange height: 12.93 ± 0.3
- Bottom flange width: $3 - 1.38 \pm 0.1$
- Bottom flange height: 9.75
- Bottom flange width: 2.54
- Bottom flange height: 2.54
- Bottom flange width: 0.80
- Bottom flange height: 3.18
- Bottom flange width: 6.47
- Bottom flange height: 6.10 ± 0.1
- Bottom flange width: 1.80 ± 0.1
- Bottom flange height: 1.80

Top View Dimensions:

- Overall width: 10.06 ± 0.15
- Overall height: 15.87 ± 0.15
- Top flange width: 7.00 ± 0.15
- Top flange thickness: 3.30
- Central hole diameter: $3 - \phi 1.50$ (depth 0.15)
- Central hole diameter: 8.0
- Bottom flange width: 8.0
- Bottom flange thickness: 4.90
- Bottom flange radius: $R0.5$
- Bottom flange height: 12.93 ± 0.3
- Bottom flange width: $3 - 1.38 \pm 0.1$
- Bottom flange height: 9.75
- Bottom flange width: 2.54
- Bottom flange height: 2.54
- Bottom flange width: 0.80
- Bottom flange height: 3.18
- Bottom flange width: 6.47
- Bottom flange height: 6.10 ± 0.1
- Bottom flange width: 1.80 ± 0.1
- Bottom flange height: 1.80

Side View Dimensions:

- Overall width: 4.70 ± 0.1
- Overall height: 6.68 ± 0.1
- Top flange width: 2.54 ± 0.15
- Top flange thickness: 5°
- Bottom flange width: $1.00 \times 45^\circ$
- Bottom flange thickness: 5°
- Bottom flange width: 2.82 ± 0.1
- Bottom flange height: 0.50