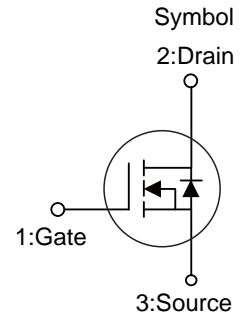


■ PRODUCT CHARACTERISTICS

V <sub>DSS</sub>	500V
R <sub>DS(ON)</sub> Typ(@V <sub>GS</sub> =10V)	2.7Ω
Qg@typ	18nC
I <sub>D</sub>	5A



■ 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



TO-252

■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT5N50BD	TO-252	2500 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS(T<sub>A</sub> =25°C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DSS</sub>	500	V
Gate-Source Voltage	V <sub>GSS</sub>	±30	V
Drain Current Continuous(@V <sub>GS</sub> =10V, T <sub>A</sub> =25°C)	I <sub>D</sub>	5	A
Drain Current Pulsed	I <sub>DM</sub>	20	A
Avalanche Energy *	E <sub>AS</sub>	60	mJ
Peak Diode Recovery dv/dt	dv/dt	5.0	V/ns
Power Dissipation	P <sub>D</sub>	50	W
Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature	T <sub>STG</sub>	-55~ +150	°C

■ THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Ambient	R <sub>thJA</sub>	100	°C/W
Junction to Case	R <sub>thJC</sub>	2.5	°C/W

Note: \* EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, L=10mH, R<sub>G</sub>=25Ω

**■ 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	$V_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	500	-	-	V
Drain to Source Leakage Current	$I_{DSS}$	$V_{DS}=500V, V_{GS}=0V$	-	-	1	$\mu A$
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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2.5A$	-	2.7	3.5	$\Omega$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
Dynamic characteristics						
Gate capacitance	$R_g$	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$	-	3.8	-	$\Omega$
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=3A$	-	4	-	S
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V$ $f=1.0\text{MHz}$	-	270	-	pF
Output Capacitance	$C_{oss}$		-	20	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	1	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	$I_D=5A, V_{DS}=250V$ $R_G=25\Omega, V_{GS}=10V$	-	12	-	ns
Rise Time	$t_r$		-	46	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	50	-	ns
Fall Time	$t_f$		-	48	-	ns
Total Gate Charge	$Q_g$	$I_D=5A, V_{DS}=250V$ $V_{GS}=10V$	-	18	-	nC
Gate to Source Charge	$Q_{gs}$		-	2.2	-	nC
Gate to Drain("Miller") Charge	$Q_{gd}$		-	9.7	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	$I_S$		-	-	5	A
Maximum Pulsed Current(Body Diode)	$I_{SM}$		-	-	20	A
Diode Forward Voltage	$V_{SD}$	$I_{SD}=5A, V_{GS}=0V$	-	0.87	1.2	V
Reverse Recovery Time	$t_{rr}$	$I_{SD}=5A, T_J=25^{\circ}\text{C}$ $di/dt=100A/\mu s$	-	193	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	250	-	nC

■ TYPICAL CHARACTERISTICS

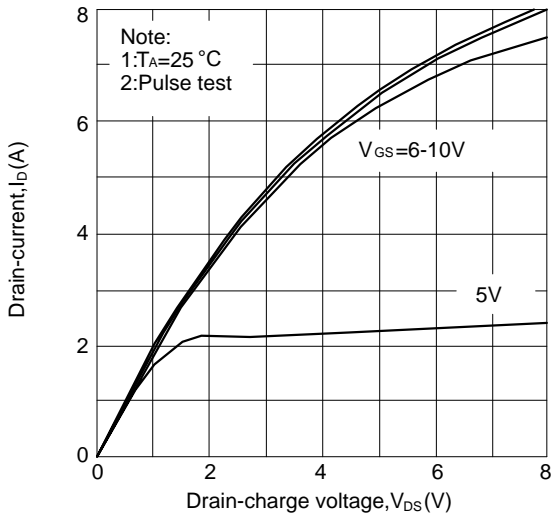


Figure 1: Drain current vs. drain-source voltage

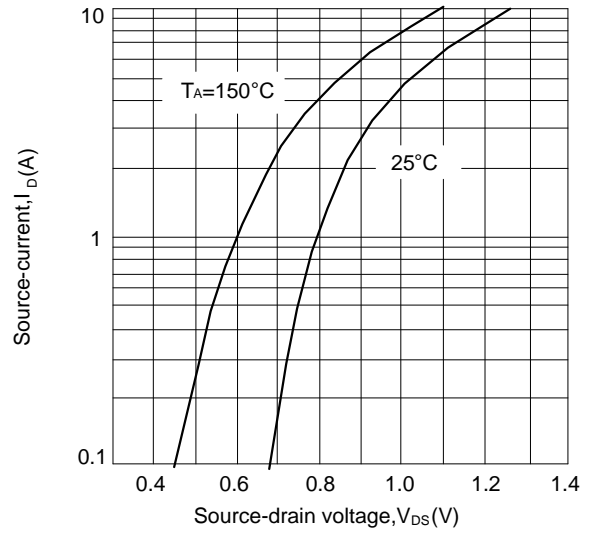


Figure 2: Source current vs. source-drain

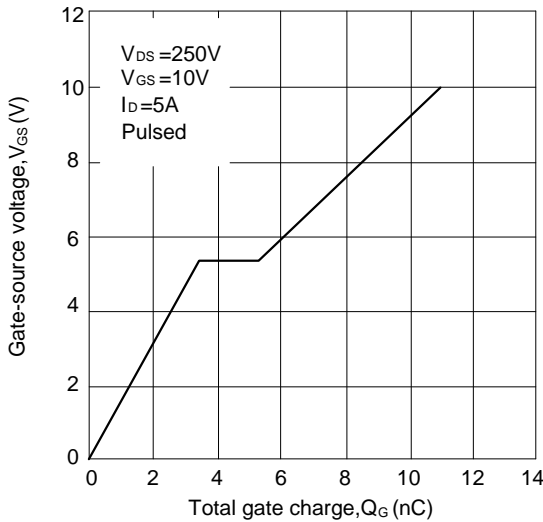


Figure 3: Gate charge characteristics

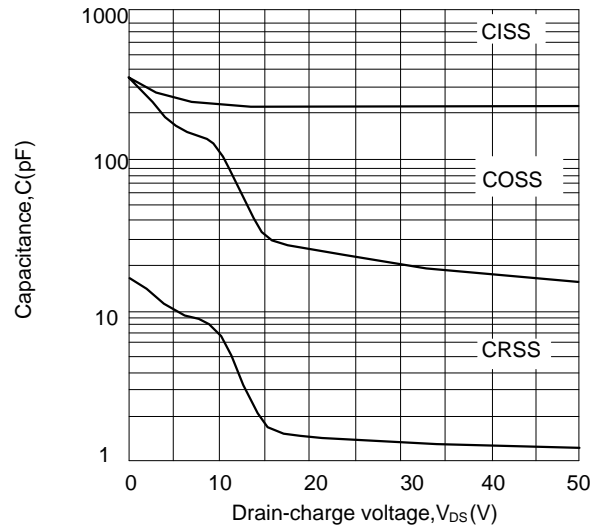


Figure 4: Capacitance characteristics

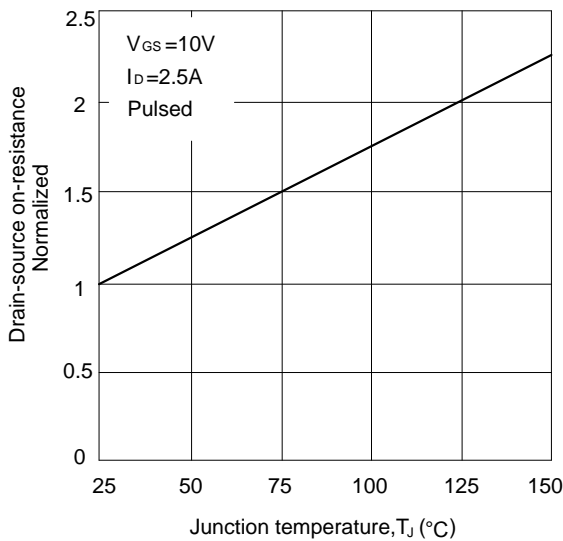


Figure 5: Drain-source on-resistance vs. junction temperature

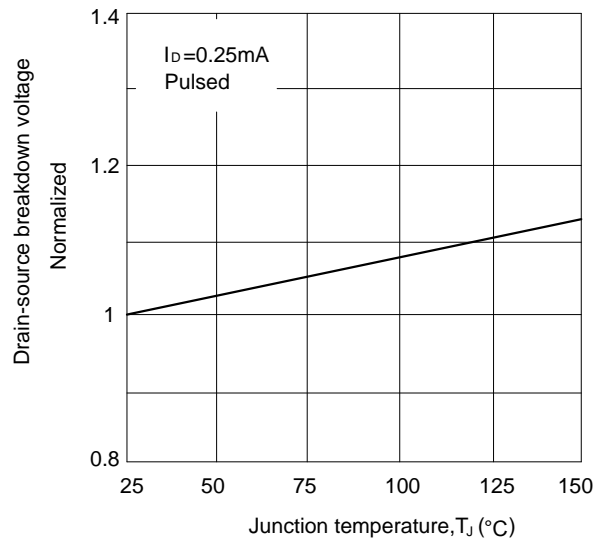


Figure 6: Breakdown voltage vs. junction temperature

■ TYPICAL CHARACTERISTICS(Cont.)

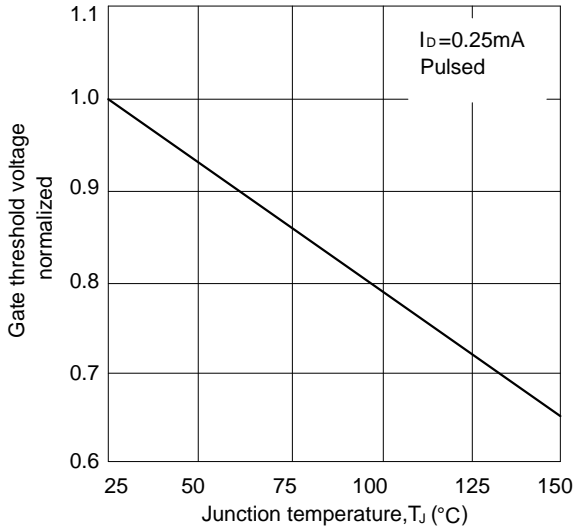


Figure 7: Gate threshold voltage vs junction temperature

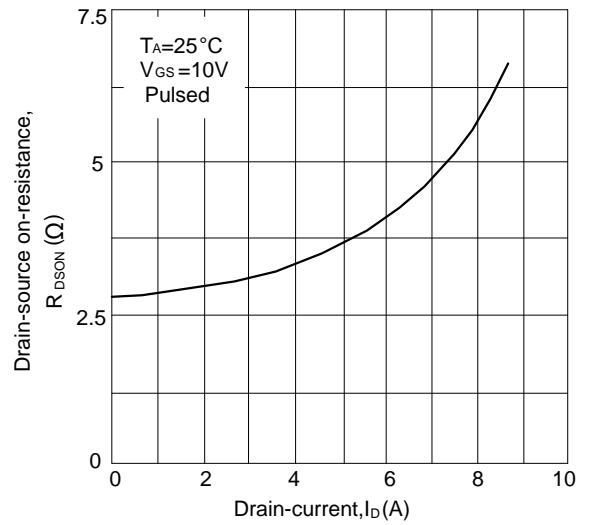


Figure 8: Drain-source on-resistance vs. drain-current

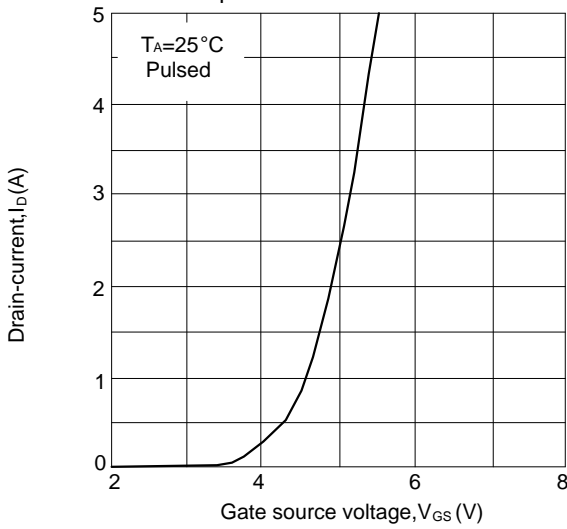


Figure 9: Drain-current vs. gate-source

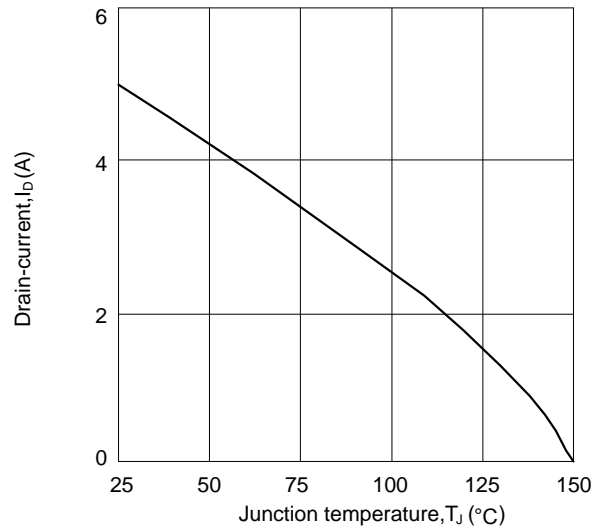


Figure 10: Drain current vs. junction temperature

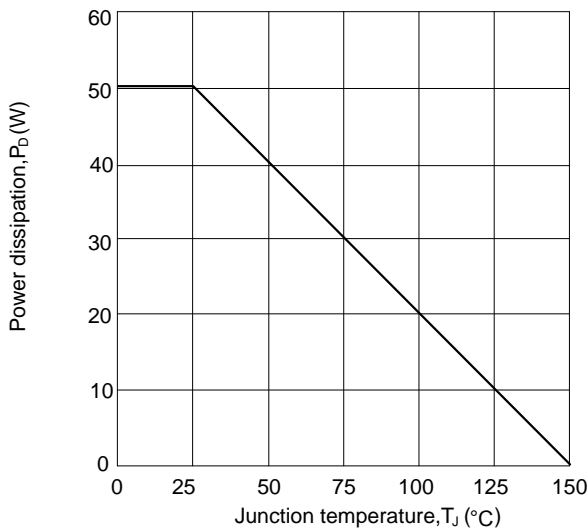


Figure 11: Power dissipation vs. junction temperature

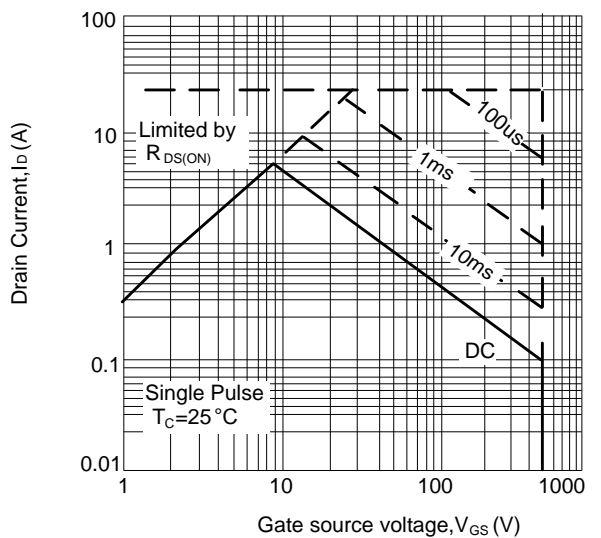


Figure 12: Safe operating area

■ TO-252 PACKAGE OUTLINE DIMENSIONS

