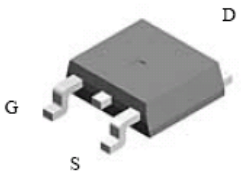
N-Channel Enhancement Mode Field Effect Transistor

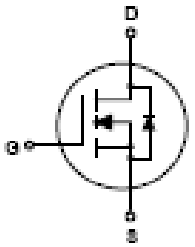
FEATURES

- Super high dense cell design for low $R_{DS(ON)}$
- Rugged and reliable
- **S**imple drive requirement
- TO-252 package

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Typ
30V	50A	6@ V_{GS}=10V
		9@ V_{GS}=4.5V

NOTE：The MT50N03 is available in a lead-free package





ABSOLUTE MAXIMUM RATINGS（T_A=25℃ unless otherwise noted）

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous[a] @Tj=125℃	I_D	50	A
- Pulse [b]	I_{DM}	350	A
Drain-source Diode Forward Current[a]	I_S	60	A
Maximum Power Dissipation[a]	P_D	70	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to Ambient[a]	Rth J_A	40	℃/W

ELECTRICAL CHARACTERISTICS (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±16V,V_{DS}=0V			±100	nA
ON CHARACTERITICS						
Gate Threshold Voltage	V_{GS}(th)	V_{DS}=V_{GS},I_D=-250μA	2		4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=30A		4.5	6	mΩ
		V_{GS}=4.5V,I_D=30A		7.5	9	
Forward Transconductance	g_{FS}	V_{GS}=15V,I_D=15A		50		S
DAYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=15V,V_{GS}=0V f=1.0MHz		2325.		pF
Output Capacitance	C_{OSS}			330		pF
Reverse Transfer Capacitance	C_{RSS}			173		pF
SWITCHING CHARACTERISISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=15V I_D=1A, V_{GEN}=10V R_L=15ohm R_{GEN}=6ohm		15.3		ns
Rise Time	tr			4		ns
Turn-Off Delay Time	$t_{D(OFF)}$			45.7		ns
Fall Time	tf			7.6		ns
Total Gate Charge	Qg	V_{DS}=15V,I_D=20A V_{GS}=5V R_{GEN}=4.7ohm		17	75	nC
Gate-Source Charge	Qgs			6		nC
Gate-Drain Charge	Qgd			5		nC

ELECTRICAL CHARACTERICS (TA=25℃ unless otherwise noted)

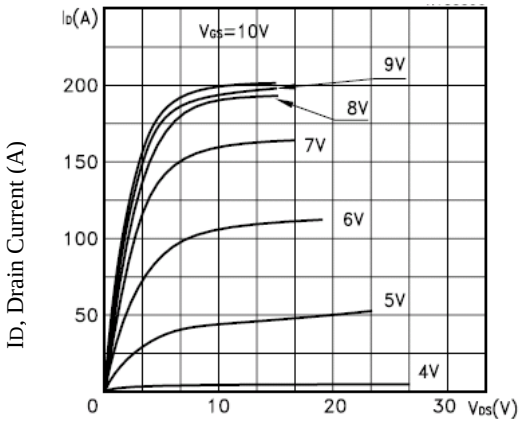
Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=50A		0.85	1.3	V

Notes

a. Surface Mounted on FR4 Board, t≦10sec

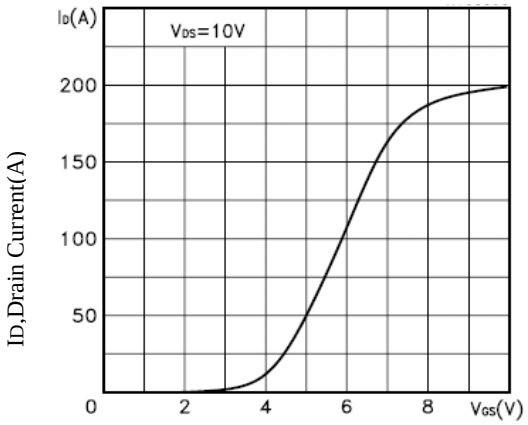
b. Pulse Test: Pulse Width≦300Us, Duty Cycle≦2%

c. Guaranteed by design, not subject to production testing.



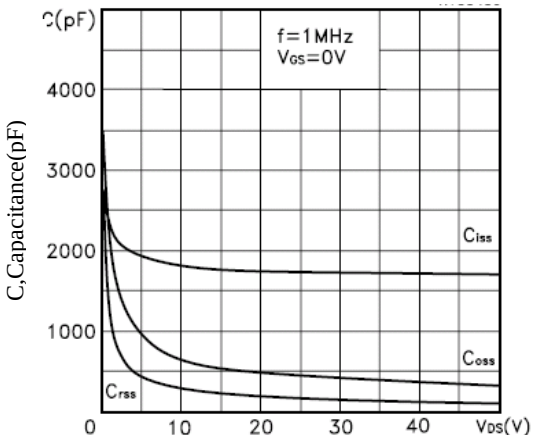
V_{DS}, Drain-to-Source Voltage (V)

Figure 1. Output Characteristics



V_{GS}, Gate-to-source Voltage (V)

Figure 2. Transfer Characteristics



VGS, Drain-to Source Voltage

Figure3. Capacitance

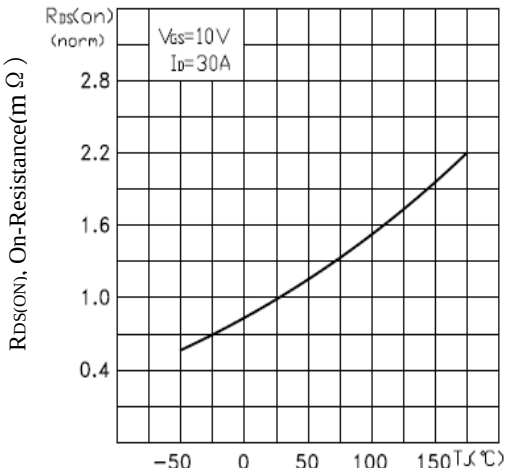


Figure4. On-Resistance Variation with Temperature

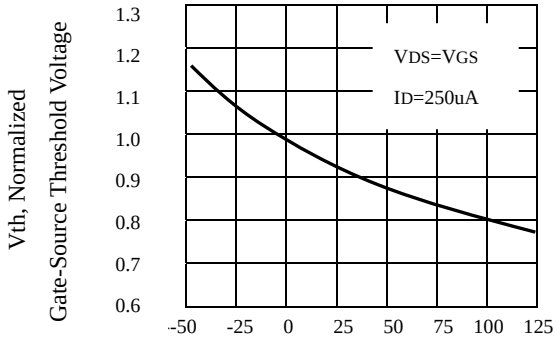


Figure5.Gate Threshold Variation With Temperature

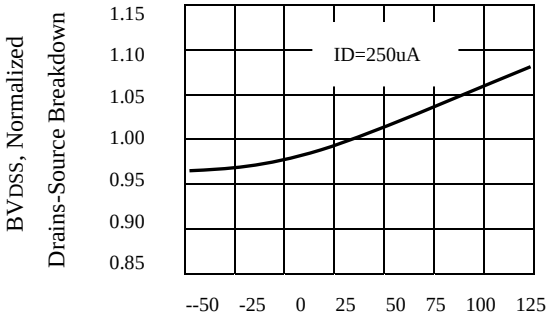


Figure6.Breakdown Voltage Variation With Temperature

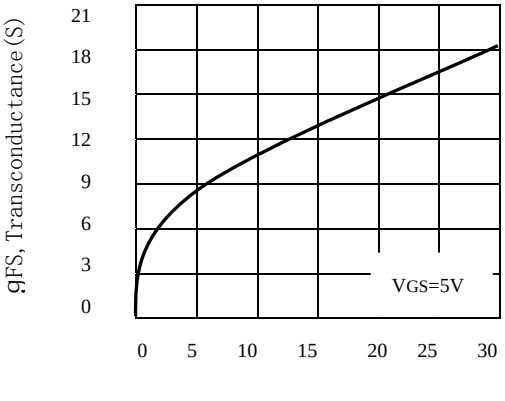


Figure7.Transconductance Variation With Drain Current

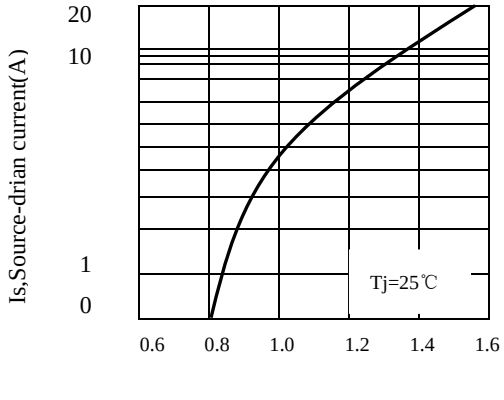


Figure8.Body Diode Forward Voltage

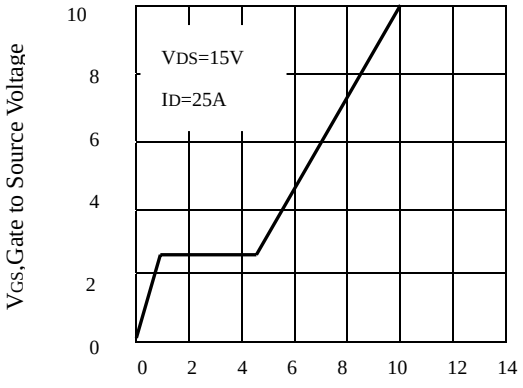


Figure9. Gate Charge

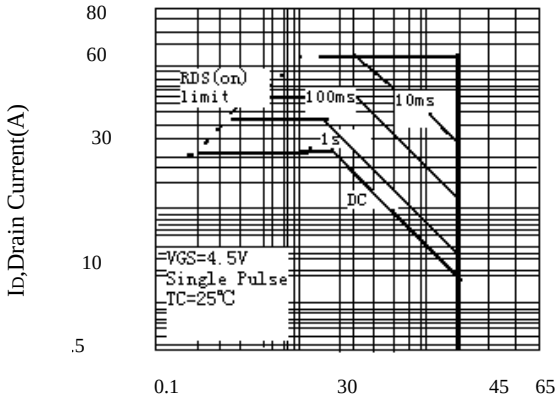


Figure10.Maximum Safe Operating Area

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