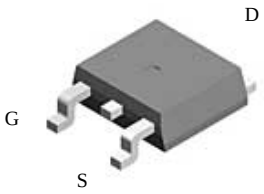
P-Channel Enhancement Mode Field Effect Transistor

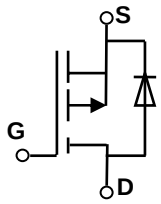
FEATURES

- 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	20@ V_{GS}=-10V
		28 @ V_{GS}=-4.5V

NOTE：The MT50P03 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}	-105	A
Drain-source Diode Forward Current[a]	I_S	-1.8	A
Maximum Power Dissipation[a]	P_D	150	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	50	℃/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}=-24V,V_{GS}=0V			-1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
ON CHARACTERITICS						
Gate Threshold Voltage	V_{GS}(th)	V_{DS}=V_{GS},I_D=-250μA	-1	-1.5	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-50A		20	23	mΩ
		V_{GS}=-4.5V,I_D=-25A		28	35	
Forward Transconductance	g_{FS}	V_{GS}=-5V,I_D=-12A		5		S
DAYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=-15V,V_{GS}=0V f=1.0MHz		582		pF
Output Capacitance	C_{OSS}			125		pF
Reverse Transfer Capacitance	C_{RSS}			86		pF
SWITCHING CHARACTERISISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=-15V I_D=-50A, V_{GEN}=-4.5V R_L=10ohm R_{GEN}=6ohm		9		ns
Rise Time	tr			10		ns
Turn-Off Delay Time	$t_{D(OFF)}$			38		ns
Fall Time	tf			23		ns
Total Gate Charge	Qg	V_{DS}=-15V,I_D=-1A V_{GS}=-10V		11.7		nC
Gate-Source Charge	Qgs			2.1		nC
Gate-Drain Charge	Qgd			2.9		nC

ELECTRICAL CHARACTERICS (TA=25℃ unless otherwise noted)

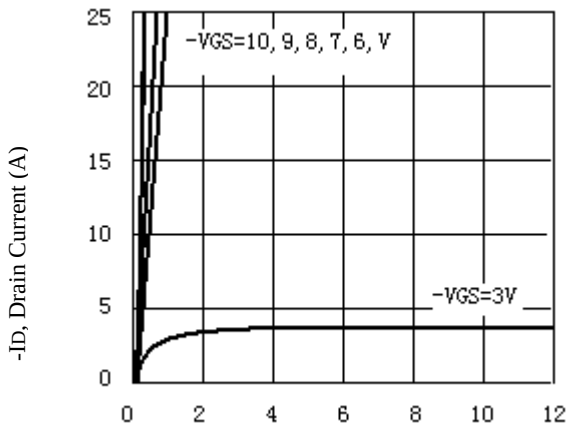
Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-1.7A		-0.84	-1.2	V

Notes

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

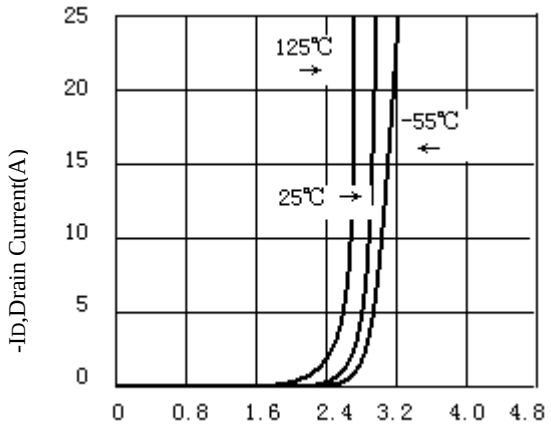
b. Pulse Test: Pulse Width≦300Us, Duty Cycle≦2%

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



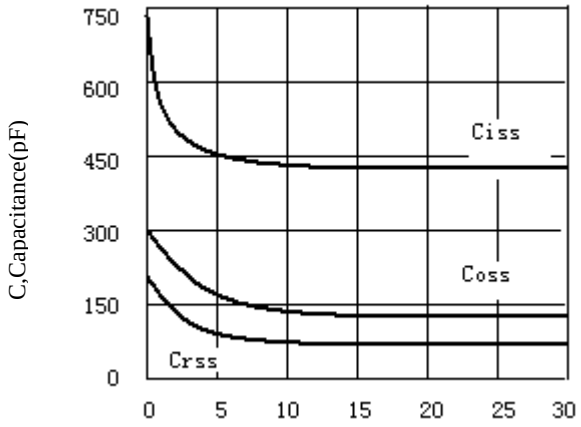
- V_{DS}, Drain-to-Source Voltage (V)

Figure 1. Output Characteristics



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

Figure 2. Transfer Characteristics



- VGS, Drain-to Source Voltage

Figure3. Capacitance

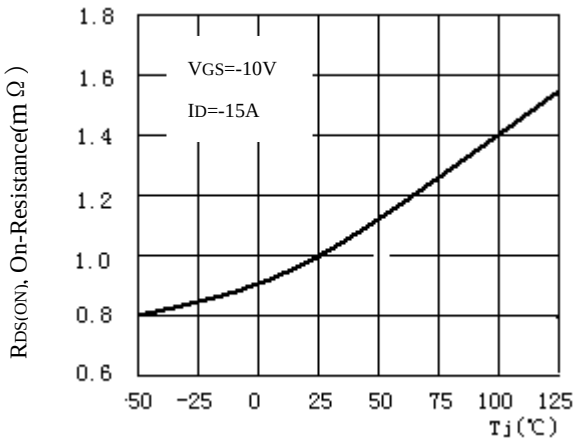


Figure4. On-Resistance Variation with Temperature

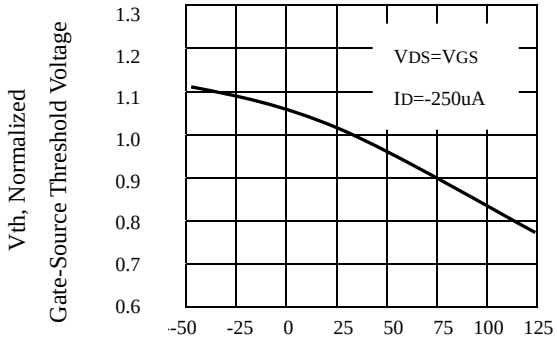


Figure5.Gate Threshold Variation With Temperature

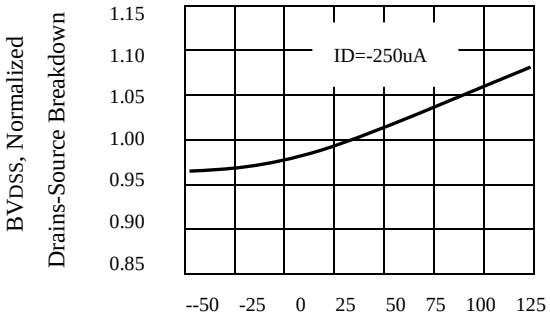


Figure6.Breakdown Voltage Variation With Temperature

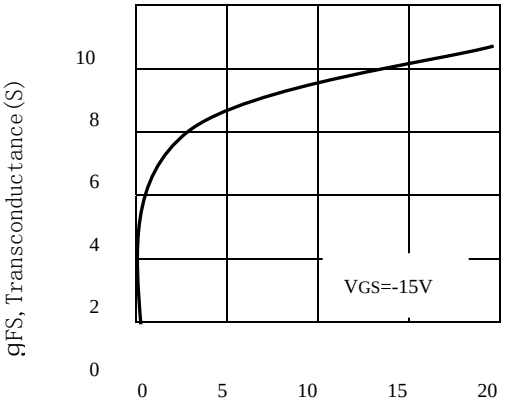


Figure7.Transconductance Variation With Drain Current

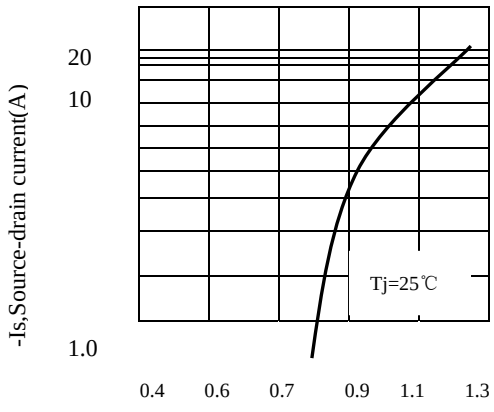


Figure8.Body Diode Forward Voltage Variation with Source Current

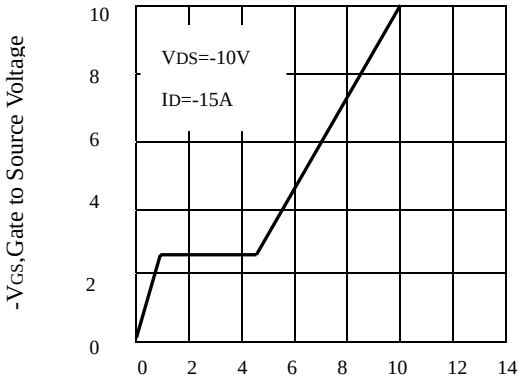


Figure9. Gate Charge

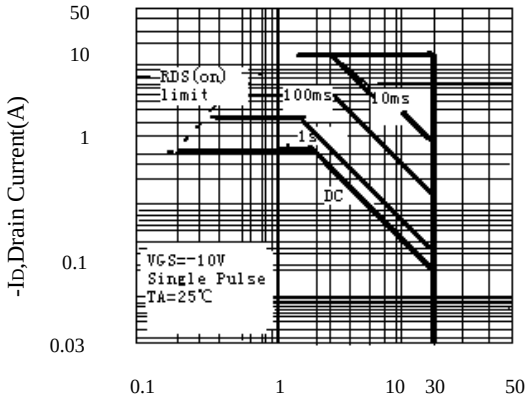


Figure10.Maximum Safe Operating Area

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