MT

Mos-tech Semiconductor Corp

MT4606

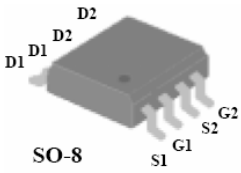
N+P-Channel Enhancement Mode Field Effect Transistor

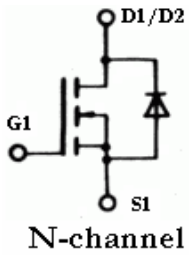
FEATURES

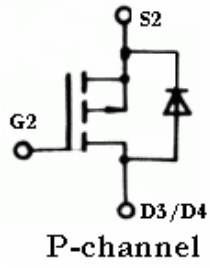
- Super high dense cell design for low $R_{DS(ON)}$
- Rugged and reliable
- **S**imple drive requirement
- SOP-8 package

PRODUCT SUMMARY			
Channel	V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Typ
N-Channel	30V	5.6A	28@ V_{GS}=10V
			50 @ V_{GS}=4.5V
P-Channel	-30V	-5.3A	38@ V_{GS}=-10V
			75 @ V_{GS}=-4.5V

NOTE：The MT4606 is available in a lead-free package







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

Parameter	Symbol	Max N-channel	Max P-channel	Unit
Drain-Source Voltage	V_{DS}	-30	30	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Drain Current-Continuous[a] @Tj=125℃	I_D	-5.3	6.3	A
- Pulse [b]	I_{DM}	-24	24	A
Drain-source Diode Forward Current[a]	I_S	-1.7	1.7	A
Maximum Power Dissipation[a]	P_D	2.5	2.5	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to 150	-55 to 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to Ambient[a]	Rth J_A	50	℃/W

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N-CHANNEL ELECTRICAL CHARACTERISTICS (TA=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=5.6A		27	32	mΩ
		V_{GS}=4.5V,I_D=4.2A		50	55	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=5.6A		5		S
DAYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=15V,V_{GS}=0V f=1.0MHz		830		pF
Output Capacitance	C_{OSS}			140		pF
Reverse Transfer Capacitance	C_{RSS}			100		pF
SWITCHING CHARACTERISISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{Ds}=15V I_D=5.3A, V_{GEN}=4.5V R_L=10ohm R_{GEN}=10ohm		17		ns
Rise Time	tr			6		ns
Turn-Off Delay Time	$t_{D(OFF)}$			23		ns
Fall Time	tf			11		ns
Total Gate Charge	Qg	V_{DS}=15V,I_D=1A V_{GS}=10V		8		nC
Gate-Source Charge	Qgs			3		nC
Gate-Drain Charge	Qgd			3		nC

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N-CHANNEL 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=1.25A		0.84	1.2	V

Notes

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

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

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

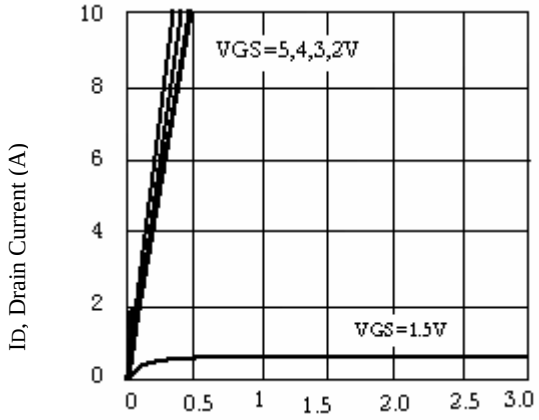

Figure 1.Output Characteristics

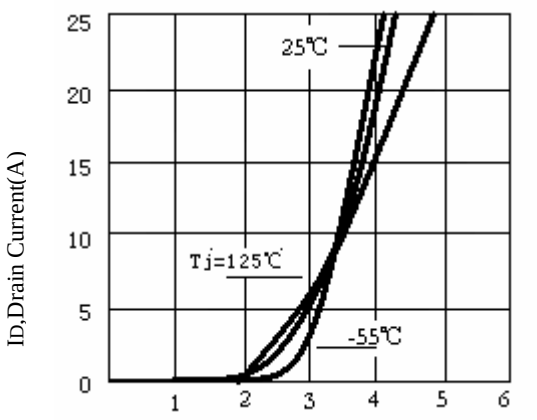

Figure 2.Transfer Characteristics

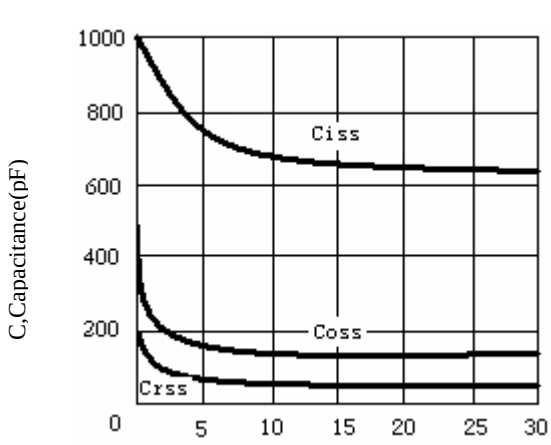

Figure3.Capacitance

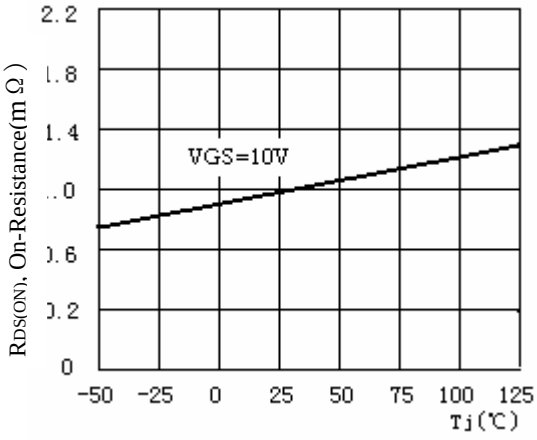

Figure4. On-Resistance Variation with Temperature

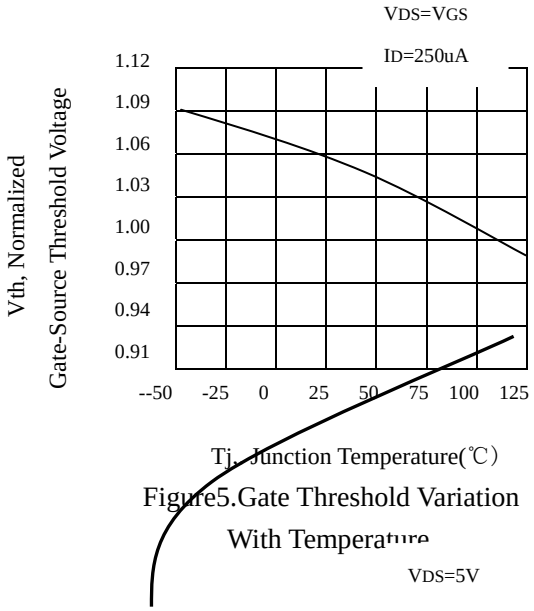

Figure5.Gate Threshold Variation With Temperature

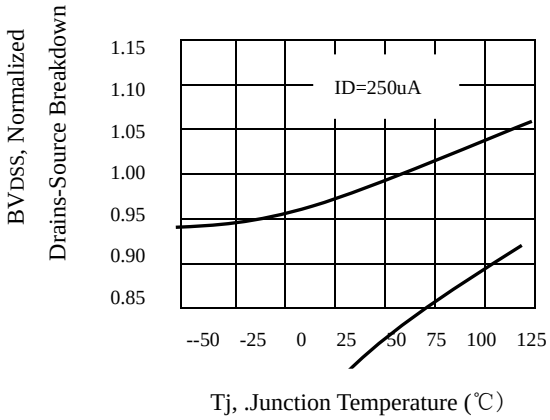

Figure6.Breakdown Voltage Variation With Temperature

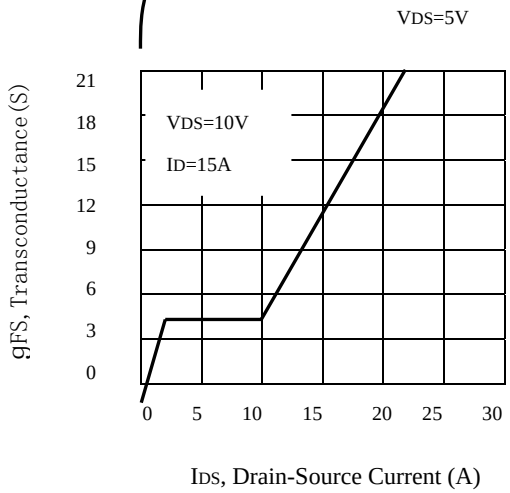

Figure7.Transconductance Variation With Drain Current

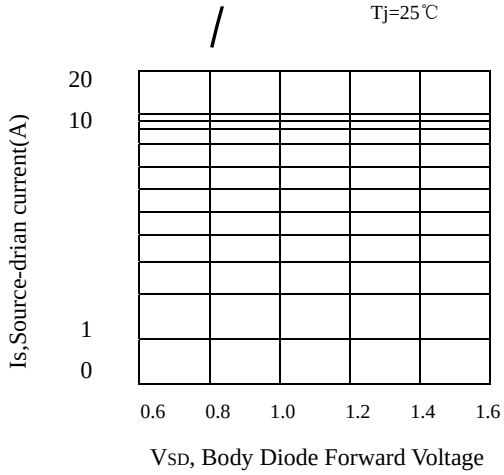

Figure8.Body Diode Forward Voltage Variation with Source Current

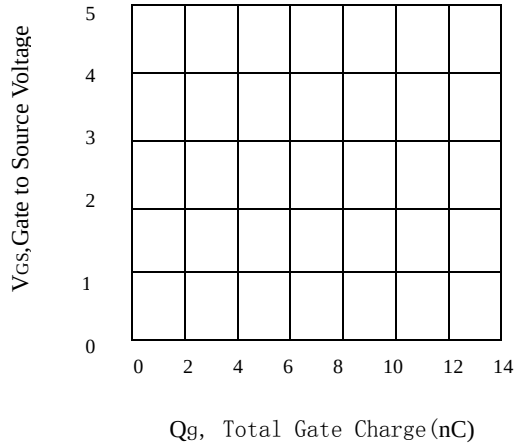

Figure9. Gate Charge

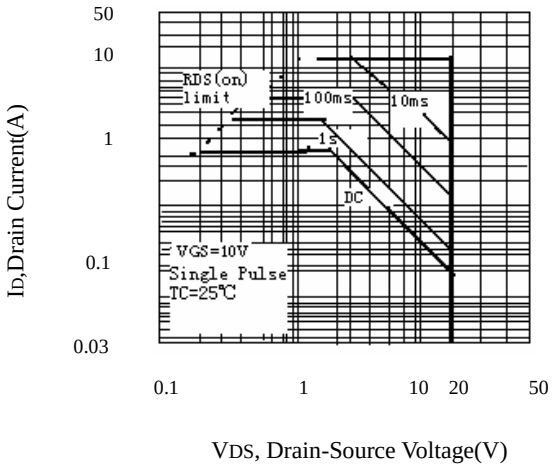

Figure10.Maximum Safe Operating Area

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P-CHANNEL ELECTRICAL CHARACTERISTICS (TA=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=-5.6A		46	55	mΩ
		V_{GS}=-4.5V,I_D=-4.2A		78	85	
Forward Transconductance	g_{FS}	V_{GS}=-5V,I_D=-5.6A		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_{Ds}=-15V I_D=-5.3A, V_{GEN}=-4.5V R_L=10ohm R_{GEN}=10ohm		9		ns
Rise Time	tr			10		ns
Turn-Off Delay Time	$t_{D(OFF)}$			38		ns
Fall Time	tf			23		ns
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-1A V_{GS}=-10V		11.7		nC
Gate-Source Charge	Q_{gs}			2.1		nC
Gate-Drain Charge	Q_{gd}			2.9		nC

P-CHANNEL 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

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

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

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

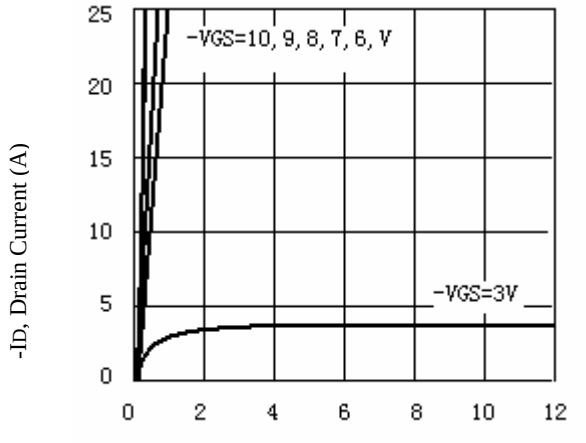


Figure 1.Output Characteristics

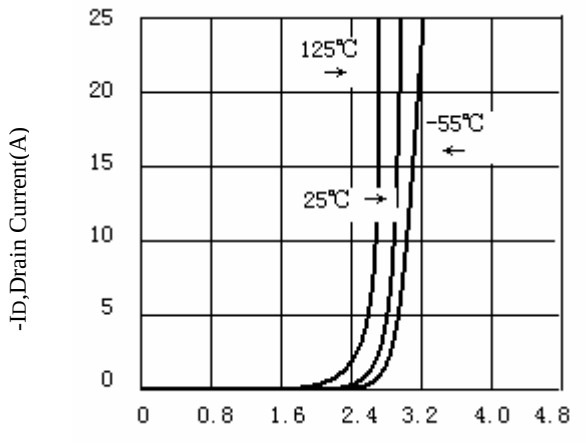


Figure 2.Transfer Characteristics

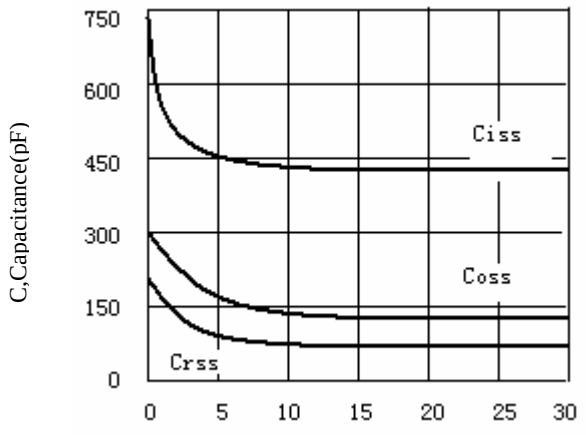
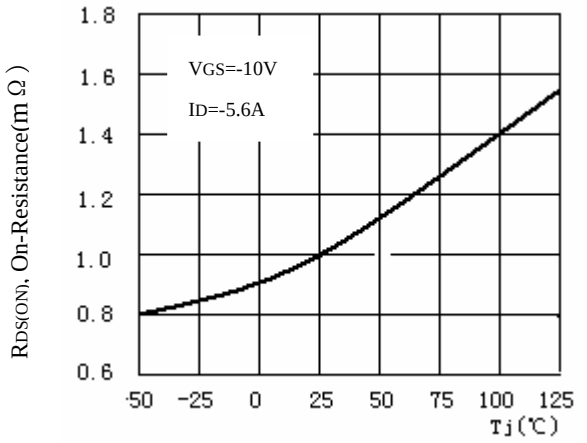


Figure3.Capacitance



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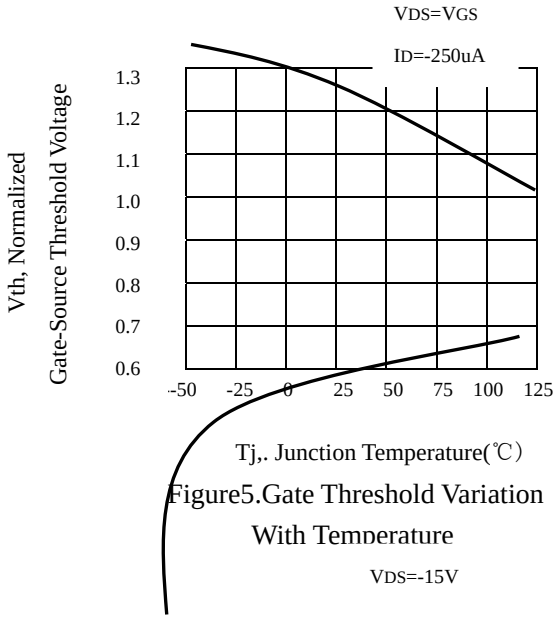


Figure5.Gate Threshold Variation With Temperature

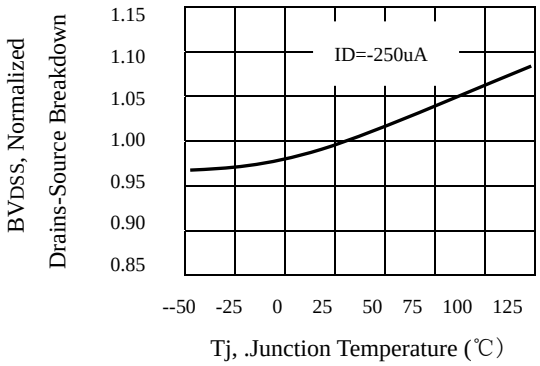


Figure6.Breakdown Voltage Variation With Temperature

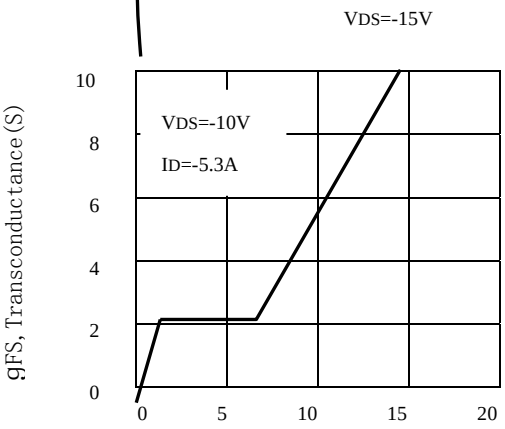


Figure7.Transconductance Variation With Drain Current

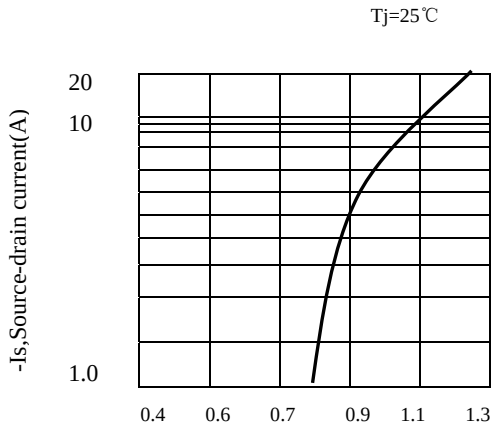


Figure8.Body Diode Forward Voltage Variation with Source Current

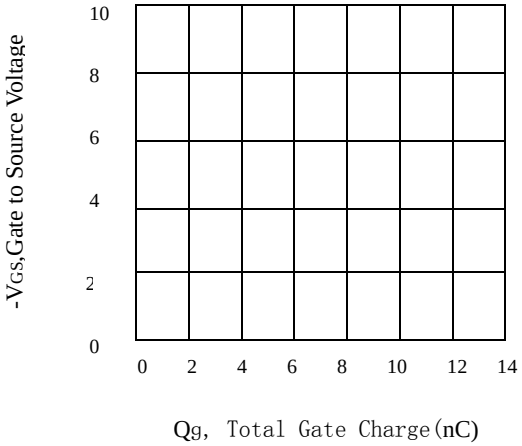
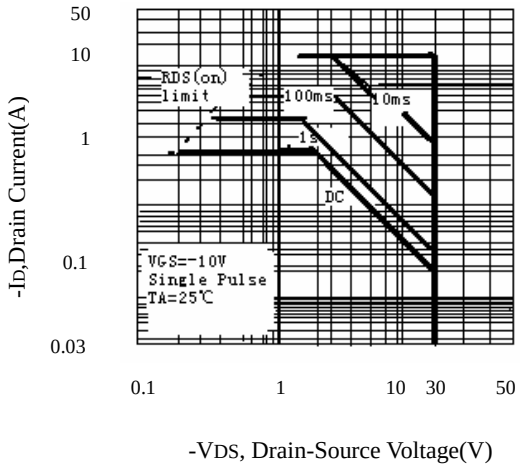


Figure9. Gate Charge



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