MT8205

N-Channel Enhancement Mode Field Effect Transistor

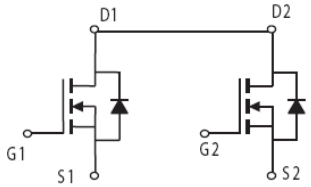
MT Semiconductor®

http://www.mtsemi.com

Product Summary

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Typ
20V	4A	21@ V_{GS}=4.5V
		25@ V_{GS}=2.5V

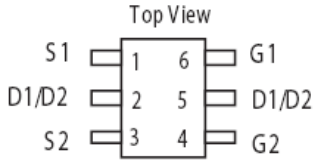
Simplified Schematic



Features

- Super high dense cell design for low $R_{DS(ON)}$
- Rugged and reliable
- Simple drive requirement
- SOT-23-6 package

MARKING DIAGRAM & PIN ASSIGNMENT



Applications

- Portable battery packs

Absolute Maximum Ratings (T_A = 25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous[a] @Tj=125℃	I_D	4	A
- Pulse d[b]	I_{DM}	20	A
Drain-source Diode Forward Current[a]	I_S	1.7	A
Maximum Power Dissipation[a]	P_D	1.25	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	80	℃/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	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±8V,V_{DS}=0V			±100	nA
ON CHARACTERITICS						
Gate Threshold Voltage	V_{GS}(th)	V_{DS}=V_{GS},I_D=250μA	0.5	0.8	1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V,I_D=4A		21	25	mΩ
		V_{GS}=2.5V,I_D=2.8A		25	27	
Forward Transconductance	g_{FS}	V_{GS}=5V,I_D=5A		5		S
DAYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=10V,V_{GS}=0V f=1.0MHz		608		pF
Output Capacitance	C_{OSS}			115		pF
Reverse Transfer Capacitance	C_{RSS}			86		pF
SWITCHING CHARACTERISISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=10V I_D=6A, V_{GEN}=4.5V R_L=10ohm R_{GEN}=10ohm		10		ns
Rise Time	tr			14		ns
Turn-Off Delay Time	$t_{D(OFF)}$			39		ns
Fall Time	tf			26		ns
Total Gate Charge	Qg	VDS=10V,I_D=1A V_{GS}=4.5V		9.2		nC
Gate-Source Charge	Qgs			1.6		nC
Gate-Drain Charge	Qgd			2.6		nC

ELECTRICAL CHARACTERICS (TA=25℃ unless otherwise noted)

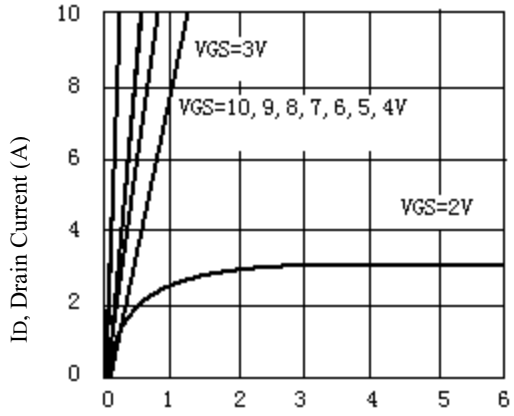
Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=1.7A		0.84	1.3	V

Notes

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

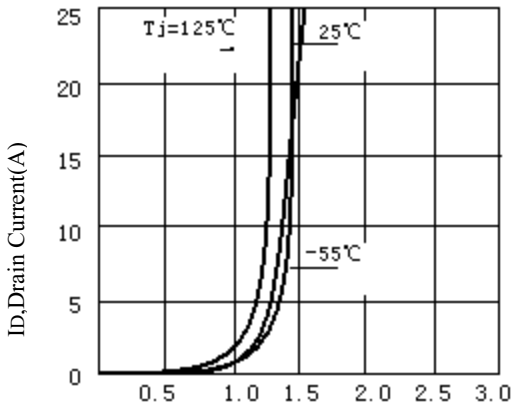
b. Pulse Test: Pulse Width≦300Us, Duty Cycle≦2%

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



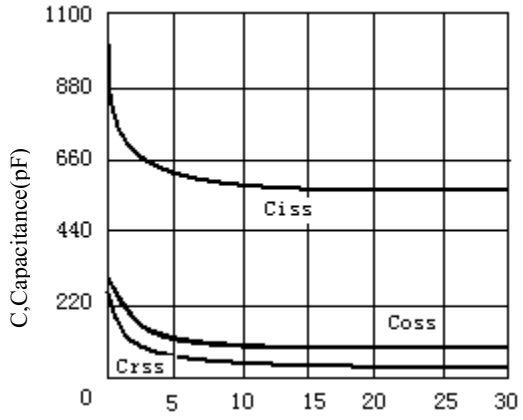
V_{DS}, Drain-to-Source Voltage (V)

Figure 1.Output Characteristics



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

Figure 2.Transfer Characteristics



VGS, Drain-to Source Voltage

Figure3.Capacitance

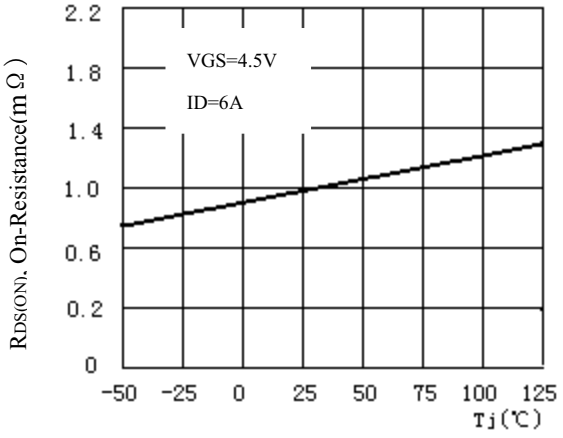


Figure4. On-Resistance Variation with Temperature

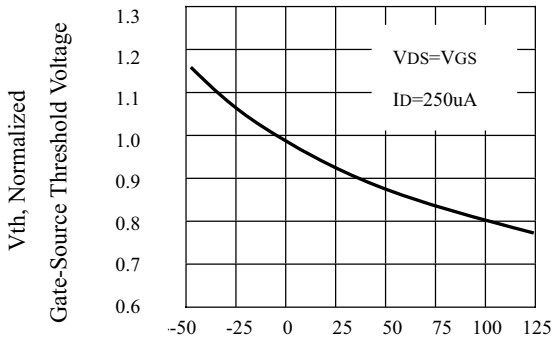


Figure5.Gate Threshold Variation With Temperature

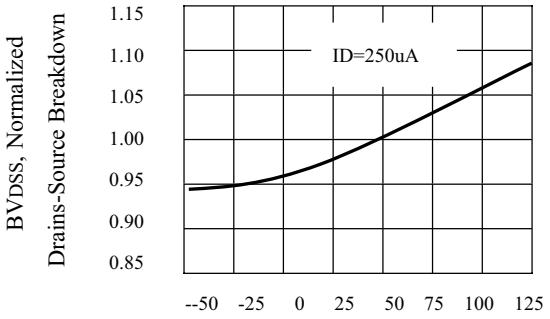


Figure6.Breakdown Voltage Variation With Temperature

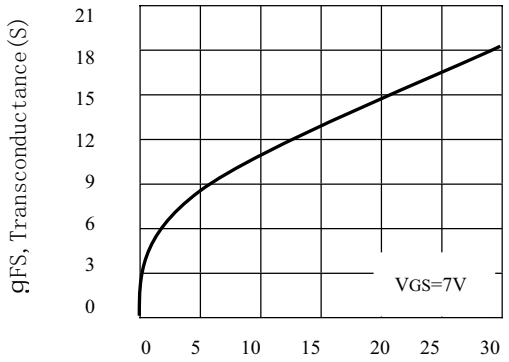


Figure7.Transconductance Variation With Drain Current

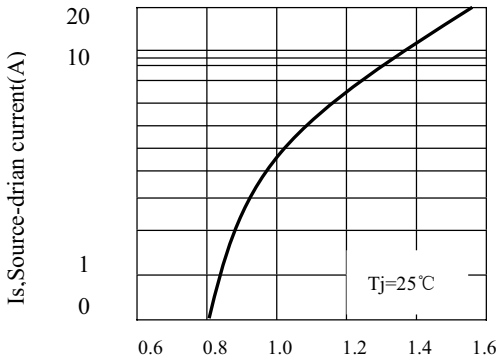


Figure8.Body Diode Forward Voltage Variation with Source Current

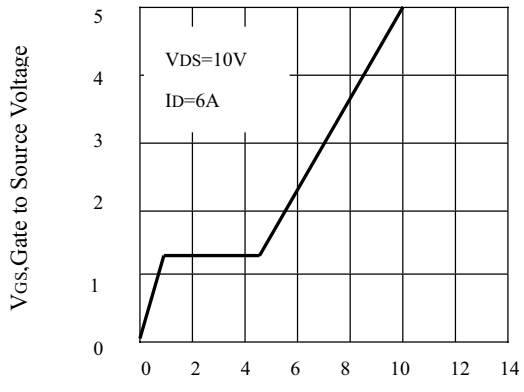


Figure9. Gate Charge

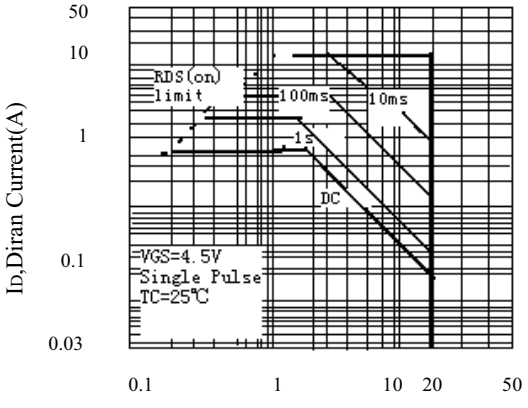


Figure10.Maximum Safe Operating Area

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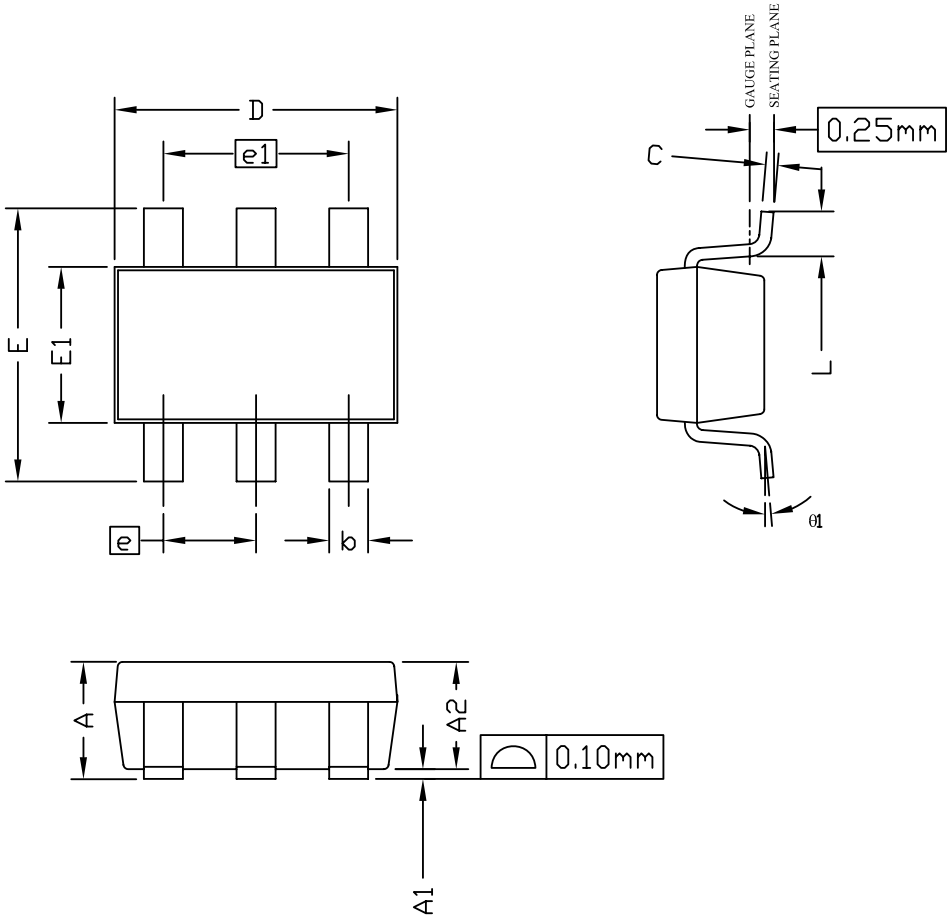
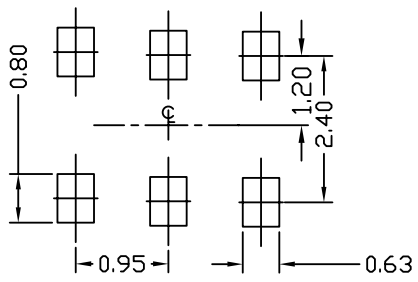
SOT23_6 PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	----	1.25	0.035	----	0.049
A1	0.00	----	0.15	0.00	----	0.006
A2	0.70	1.10	1.20	0.028	0.043	0.047
b	0.30	0.40	0.50	0.012	0.016	0.020
C	0.08	0.13	0.20	0.003	0.005	0.008
D	2.70	2.90	3.10	0.106	0.114	0.122
E	2.50	2.80	3.10	0.098	0.110	0.122
E1	1.50	1.60	1.70	0.059	0.063	0.067
e	0.95 BSC.			0.037BSC.		
e1	1.90 BSC.			0.075 BSC.		
L	0.30	----	0.60	0.012	----	0.024
θ1	0°	----	8°	0°	----	8°

UNIT: mm

NOTE
1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
   MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 5 MILS EACH.
2. DIMENSION "L" IS MEASURED IN GAGE PLANE.
3. TOLERANCE ±0.100 mm(4 mil) UNLESS OTHERWISE SPECIFIED.
4. FOLLOWED FROM JEDEC MO-178C & MO-193C.
5. CONTROLLING DIMENSIONS IS MILLIMETER.
   CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

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