

MT4936

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Typ
30V	6.6A	32@ V _{GS} =10V
		43@ V _{GS} =4.5V

Features

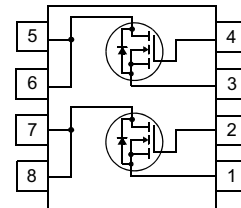
- Super high dense cell design for low R_{DS(ON)}
- Rugged and reliable
- Simple drive requirement
- SO-8 package



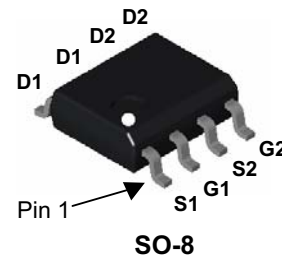
MT Semiconductor®

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Simplified Schematic



MARKING DIAGRAM & PIN ASSIGNMENT



Absolute Maximum Ratings (T_A = 25°C 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 @T _j =125°C	I _D	6.6	A
- Pulse ^d	I _{DM}	28	A
Drain-source Diode Forward Current ^a	I _S	1.7	A
Maximum Power Dissipation ^a	P _D	2.5	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to Ambient ^a	R _{th JA}	50	°C/W
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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

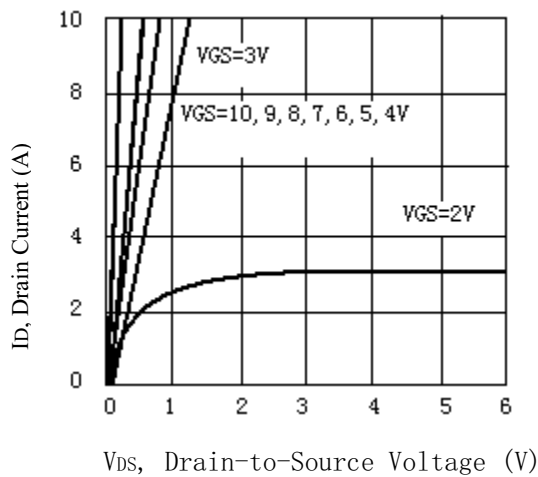
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V,I _D =-250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V,V _{GS} =0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±16V,V _{DS} =0V			±100	nA
ON CHARACTERITICS						
Gate Threshold Voltage	V _{GS} (th)	V _{DS} =V _{GS} ,I _D =-250μA	0.8	1.1	2.0	V
Drain-Source On-State Resistance	R _{DS} (ON)	V _{GS} =10V,I _D =5A		32	40	m Ω
		V _{GS} =4.5V,I _D =3.0A		43	54	
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		586		pF
Output Capacitance	C _{OSS}			101		pF
Reverse Transfer Capacitance	C _{RSS}			59		pF
SWITCHING CHARACTERISISTICS						
Turn-On Delay Time	t _D (ON)	V _{DD} =10V I _D =15 A, V _{GEN} =4.5V R _L =10ohm R _{GEN} =10ohm		6.5		ns
Rise Time	t _r			32.1		ns
Turn-Off Delay Time	t _D (OFF)			58.4		ns
Fall Time	t _f			48		ns
Total Gate Charge	Q _g	V _{DS} =10V,I _D =1A V _{GS} =4.5V		6		nC
Gate-Source Charge	Q _{gs}			1.35		nC
Gate-Drain Charge	Q _{gd}			1.5		nC

ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

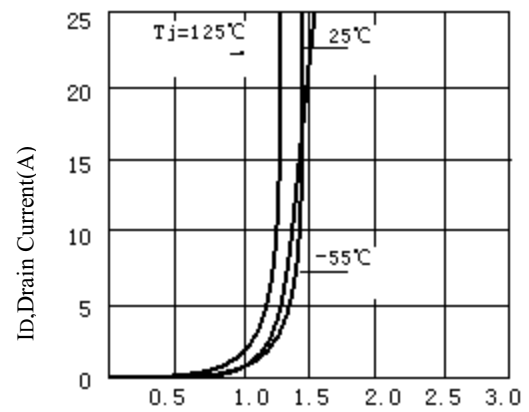
Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1.25A		0.84	1.2	V

Notes

- Surface Mounted on FR4 Board, $t \leq 10\text{sec}$
- Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- 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

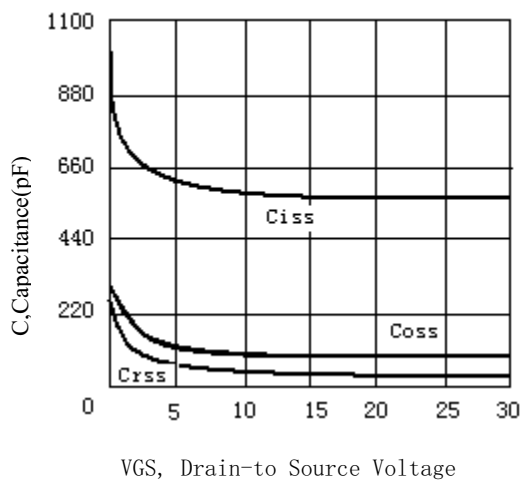


Figure3. Capacitance

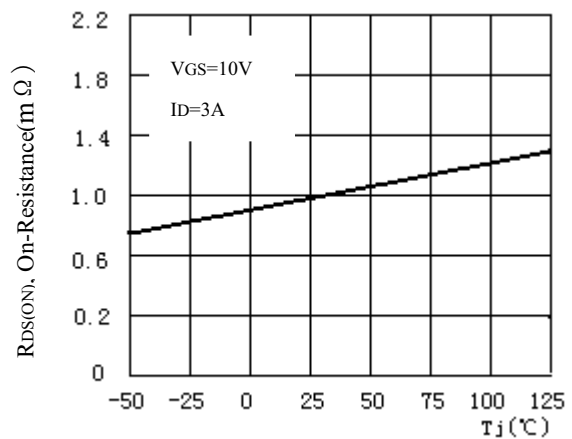
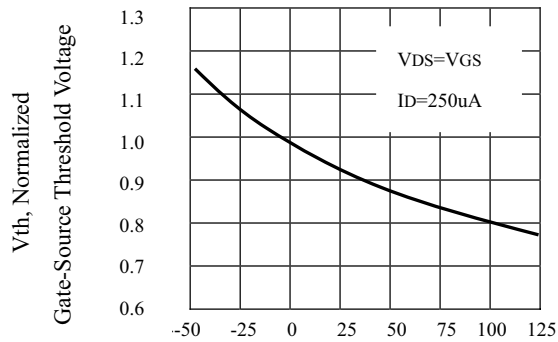
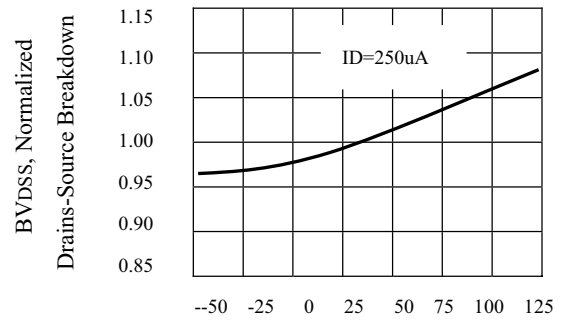


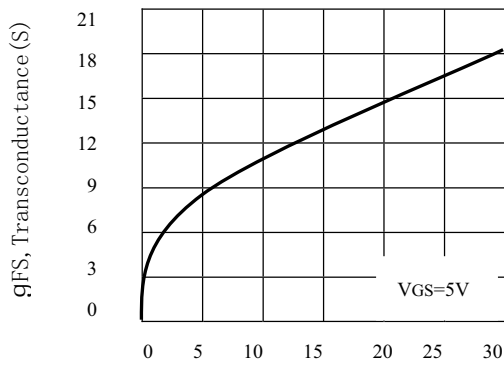
Figure4. On-Resistance Variation with Temperature



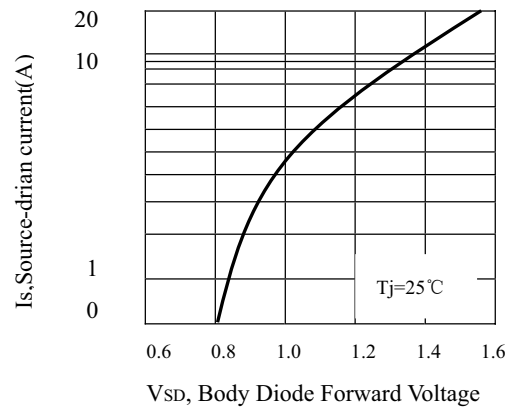
Tj, Junction Temperature(°C)
Figure5. Gate Threshold Variation
With Temperature



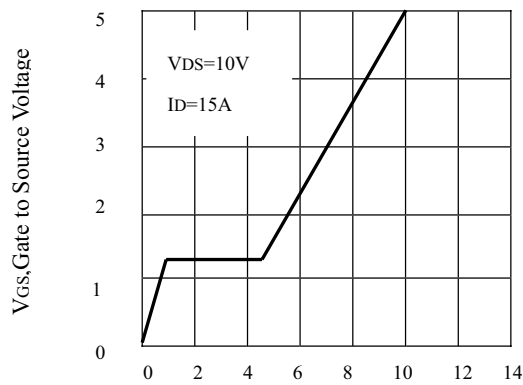
Tj, Junction Temperature (°C)
Figure6. Breakdown Voltage Variation
With Temperature



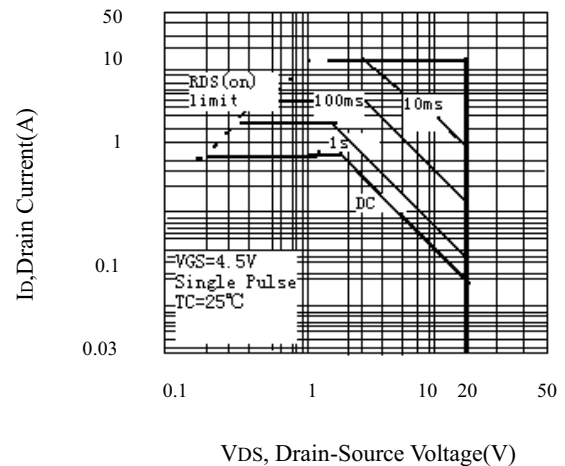
IDS, Drain-Source Current (A)
Figure7. Transconductance Variation
With Drain Current



VSD, Body Diode Forward Voltage
Figure8. Body Diode Forward Voltage
Variation with Source Current



QG, Total Gate Charge (nC)
Figure9. Gate Charge



VDS, Drain-Source Voltage(V)
Figure10. Maximum Safe Operating Area

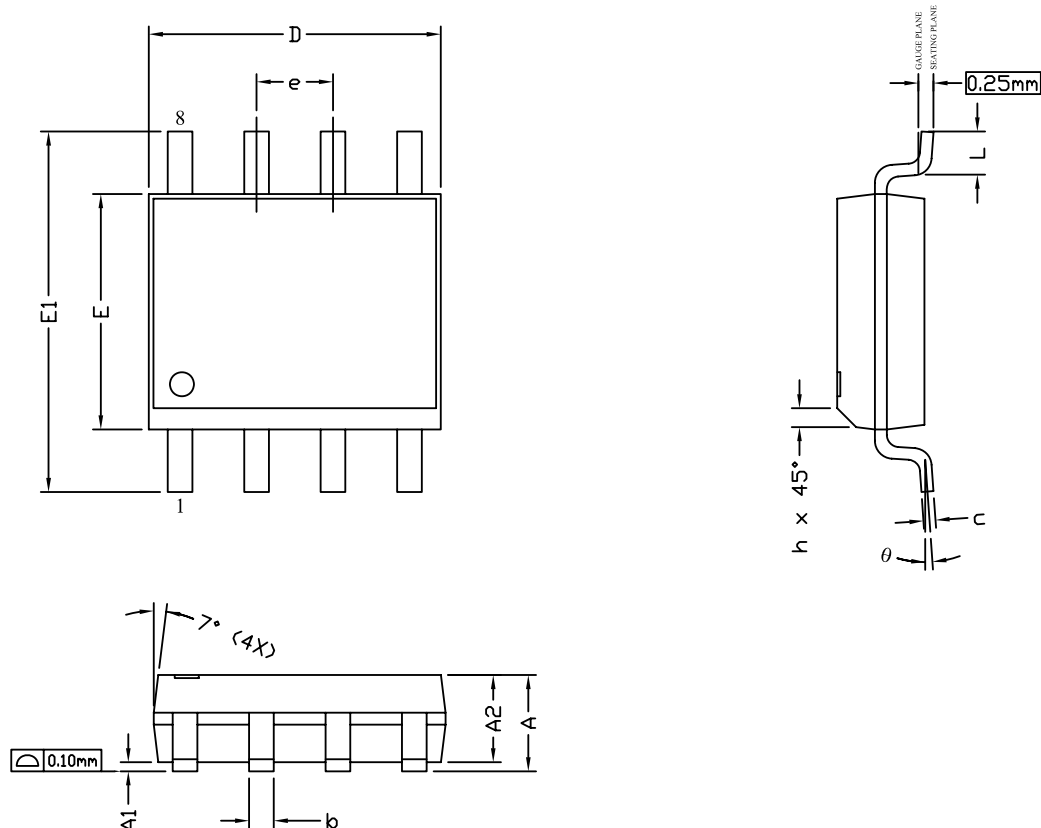
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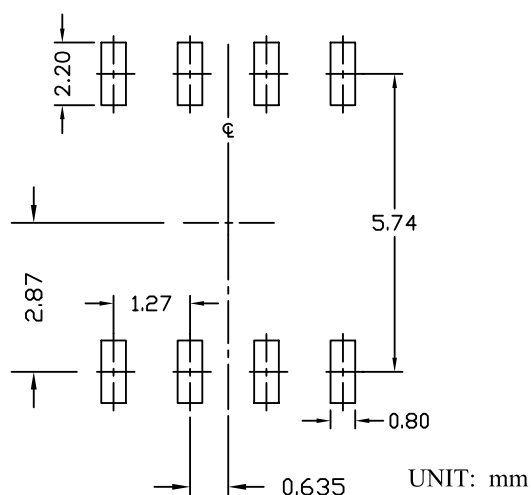
Version

rev H

S08 PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35	1.65	1.75	0.053	0.065	0.069
A1	0.10	—	0.25	0.004	—	0.010
A2	1.25	1.50	1.65	0.049	0.059	0.065
b	0.31	—	0.51	0.012	—	0.020
c	0.17	—	0.25	0.007	—	0.010
D	4.80	4.90	5.00	0.189	0.193	0.197
E	3.80	3.90	4.00	0.150	0.154	0.157
e	1.27 BSC			0.050 BSC		
E1	5.80	6.00	6.20	0.228	0.236	0.244
h	0.25	—	0.50	0.010	—	0.020
L	0.40	—	1.27	0.016	—	0.050
θ	0°	—	8°	0°	—	8°

NOTE

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONS ARE INCLUSIVE OF PLATING.
3. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MILS EACH.
4. DIMENSION L IS MEASURED IN GAUGE PLANE.
5. CONTROLLING DIMENSION IS MILLIMETER.
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

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