MT3401

P-Channel Enhancement Mode Field Effect Transistor

45@ V

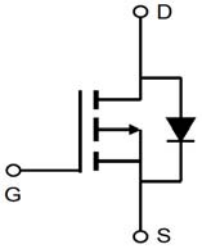
MT Semiconductor®

http://www.mtsemi.com

Product Summary

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Typ
-30V	-5.6A	35@ V_{GS}=-10V
		53@ V_{GS}=-4.5V

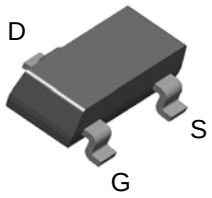
Simplified Schematic



Features

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

MARKING DIAGRAM & PIN ASSIGNMENT



SOT-23-3L

Applications

- LED Display

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

Parameter Sym	bol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous[a] @Tj=25℃	I_D	-5.6	A
- Pulse d^b	I_{DM}	-25	A
Drain-source Diode Forward Current[a]	I_S	-1.5	A
Maximum Power Dissipation[a]	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to Ambient[a] Rth	J_A	90	℃/W

ELECTRICAL CHARACTERISTICS (T_A=25℃ unless otherwise noted)

Parameter Sym	bol	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}=±10V,V_{DS}=0V			±100	nA
ON CHARACTERITICS						
Gate Threshold Voltage	V_{GS}(th) V	$_{DS}$=V_{GS},I_D=-250μA	-1.2		-2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-4.6A		35	50	mΩ
		V_{GS}=-4.5V,I_D=-3.0A		52	70	
Forward Transconductance	g_{FS}	V_{GS}=-10V,I_D=-1.7A		17		S
DAYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS}=-15V,V_{GS}=0V f=1.0MHz		1226		pF
Output Capacitance	C_{OSS}			187		pF
Reverse Transfer Capacitance	C_{RSS}			91		pF
SWITCHING CHARACTERISISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=-15V I_D=-1.0A, V_{GEN}=-10V R_L=15ohm R_{GEN}=6ohm		5.9		ns
Rise Time	tr			6.9		ns
Turn-Off Delay Time	$t_{D(OFF)}$			48		ns
Fall Time	tf			16		ns
Total Gate Charge	Qg	V_{DS}=-15V,I_D=-1.7A V_{GS}=-10V		9.8		nC
Gate-Source Charge	Qgs			1.8		nC
Gate-Drain Charge	Qgd			4.5		nC

ELECTRICAL CHARACTERICS (TA=25℃ unless otherwise noted)

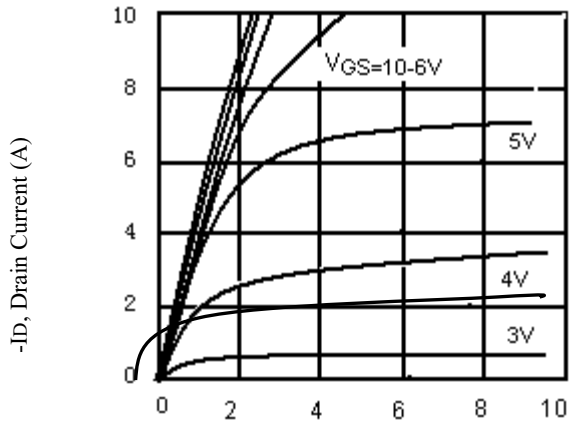
Parameter Sym	bol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-1.25A		-0.8	-1.2	V

Notes

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

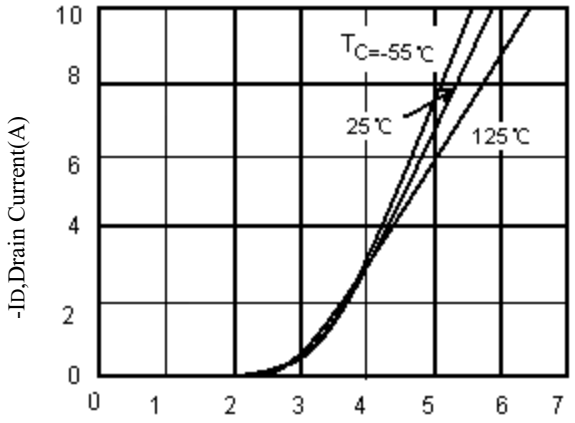
b. Pulse Test: Pulse Width≦300Us, Duty Cycle≦2%

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



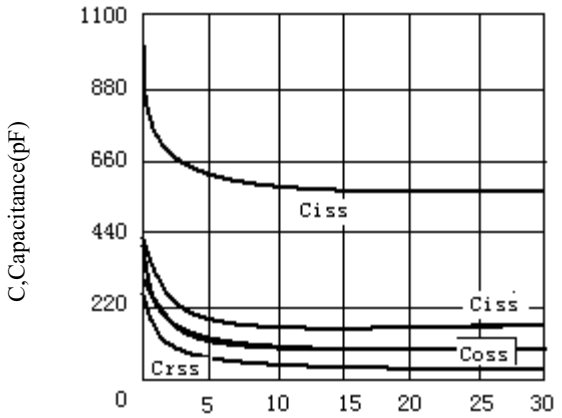
- V_{DS}, Drain-to-Source Voltage (V)

Figure 1.Output Characteristics



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

Figure 2.Transfer Characteristics



- VGS, Drain-to Source Voltage

Figure3.Capacitance

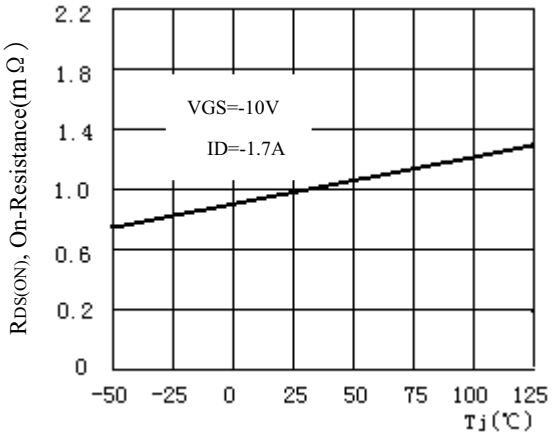


Figure4. On-Resistance Variation with Temperature

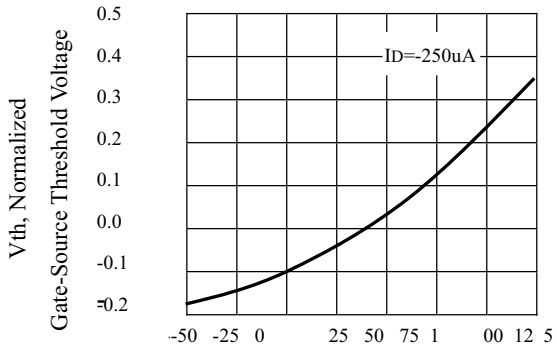
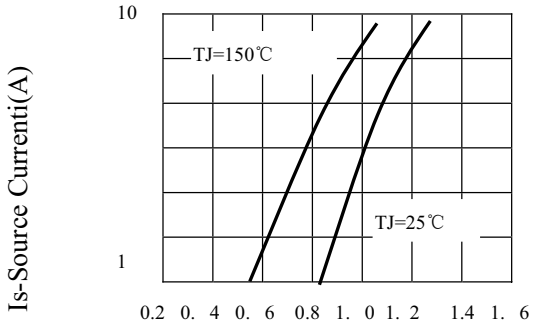


Figure5.Gate Threshold Variation With Temperature



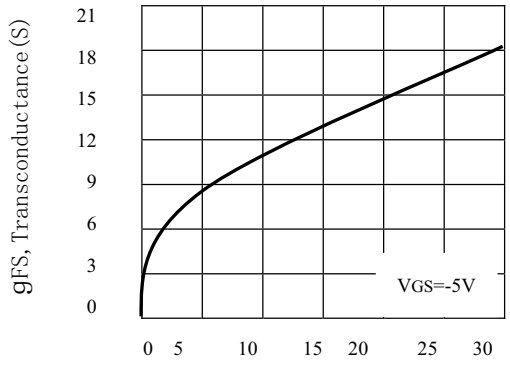


Figure7.Transconductance Variation With Drain Current

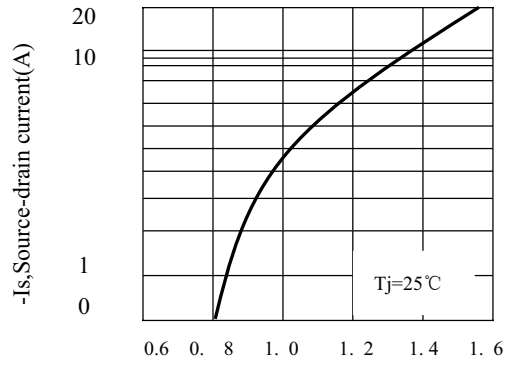


Figure8.Body Diode Forward Voltage Variation with Source Current

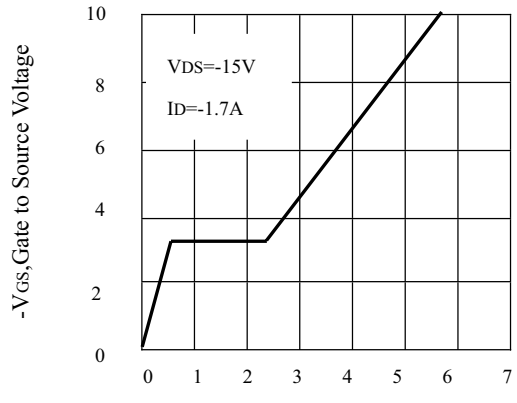


Figure9. Gate Charge

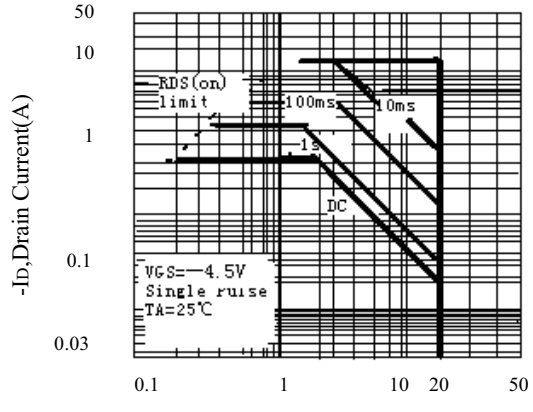
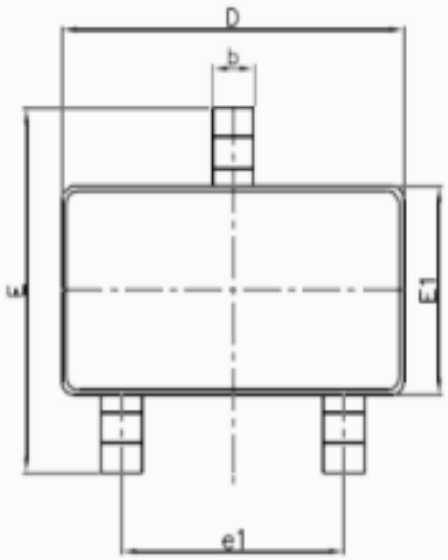
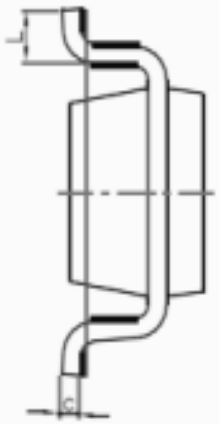
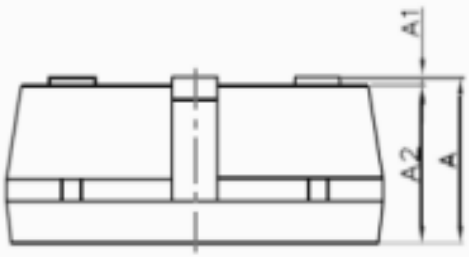


Figure10.Maximum Safe Operating Area

SOT-23-3L Package Outline Dimensions







DIM	MILLIMETERS
A	1.05~1.25
A1	0~0.1
A2	1.05~1.15
b	0.3~0.5
c	0.10~0.20
D	2.82~3.02
E	2.8~3.0
E1	1.5~1.7
e1	1.8~2.0
L	0.3~0.5

NOTE
1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH OR GATE BURRS.
   MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 5 MILS EACH.
2. TOLERANCE ±0.100 mm (4 mil) UNLESS OTHERWISE SPECIFIED.
3. DIMENSION L IS MEASURED IN GAUGE PLANE.
4. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS
   ARE NOT NECESSARILY EXACT.
5. ALL DIMENSIONS ARE IN MILLIMETERS.

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