

MT3402

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Typ
30V	2.5A	55 @ V _{GS} =10V
		80 @ V _{GS} =4.5V

Features

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

Applications

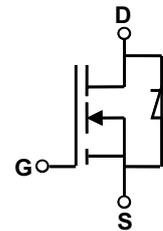
- Notebook Computer
- Portable Battery Pack



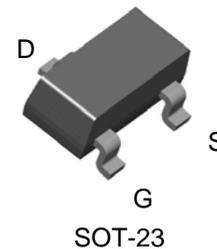
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Simplified Schematic



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}	12	V
Drain Current-Continuous ^a @T _j =125°C	I _D	2.5	A
	- Pulse <i>d</i> ^b	I _{DM}	10
Drain-source Diode Forward Current ^a	I _S	1.25	A
Maximum Power Dissipation ^a	P _D	1.25	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}	100	°C/W
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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

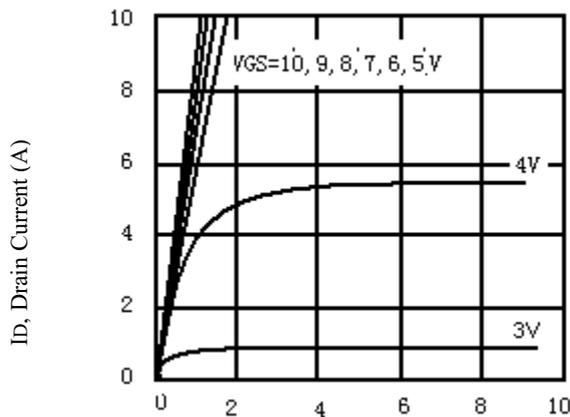
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	μA
Gate Leakage Current	I _{GSS}	V _{GS} =20V, V _{DS} =0V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0		3.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2.5A		55	70	mΩ
		V _{GS} =4.5V, I _D =2.0A		80	105	
Forward Transconductance	g _{fs}	V _{DS} =4.5V, I _D =2.5A		4.6		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V f=1.0MHz		240		pF
Output Capacitance	C _{oss}			110		pF
Reverse Transfer Capacitance	C _{rss}			17		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{d(ON)}	V _{DD} =15V I _D =1.0A, V _{GEN} =10V R _L =15Ω R _G =6Ω		8	20	ns
Rise Time	t _r			12	30	ns
Turn-Off Delay Time	t _{d(off)}			17	35	ns
Fall Time	t _f			8	20	ns
Total Gate Charge	Q _g	V _{DS} =15V, I _D =2.5A V _{GS} =4.5V		4.5	10	nC
Gate-Source Charge	Q _{gs}			0.8		nC
Gate-Drain Charge	Q _{gd}			1.0		nC

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

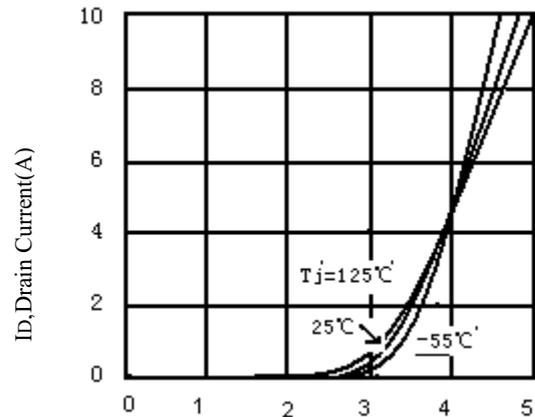
Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	VSD	VGS=0V, Is=1.25A		0.77	1.2	V

Notes

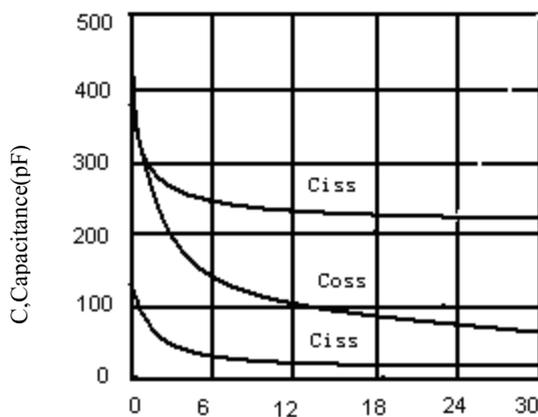
- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$
- b. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- c. Guaranteed by design, not subject to production testing.



VDS, Drain-to-Source Voltage (V)
Figure 1. Output Characteristics

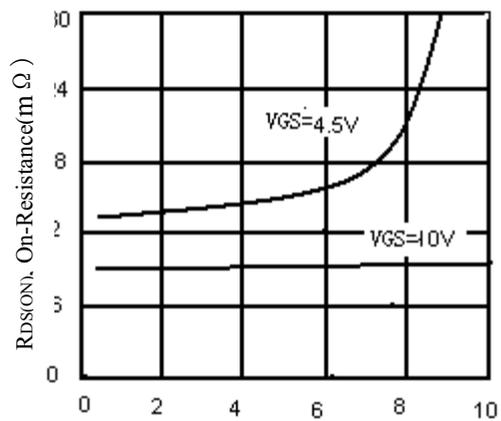


VGS, Gate-to-source Voltage (V)
Figure 2. Transfer Characteristics

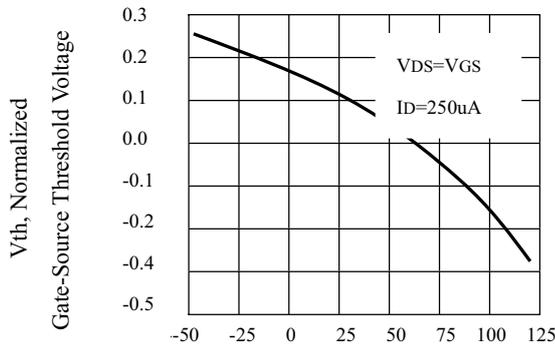


VGS, Drain-to-Source Voltage

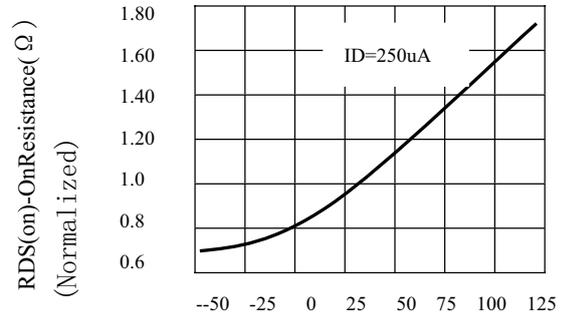
Figure3. Capacitance



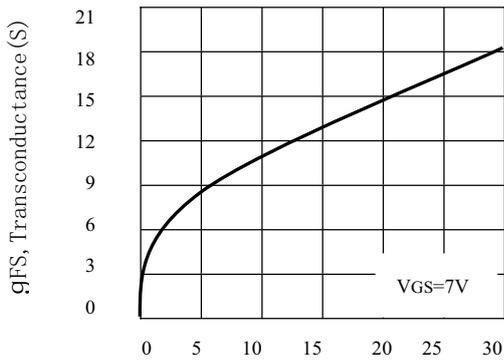
ID=DrainCurrent (A)



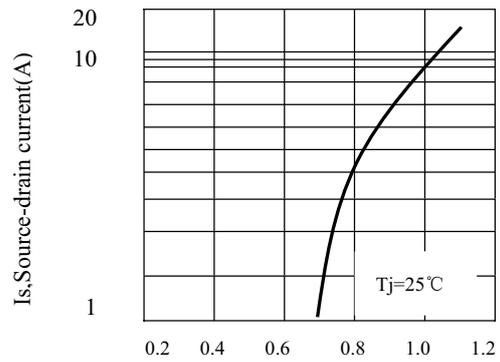
Tj, Junction Temperature(°C)
 Figure5.Gate Threshold Variation
 With Temperature



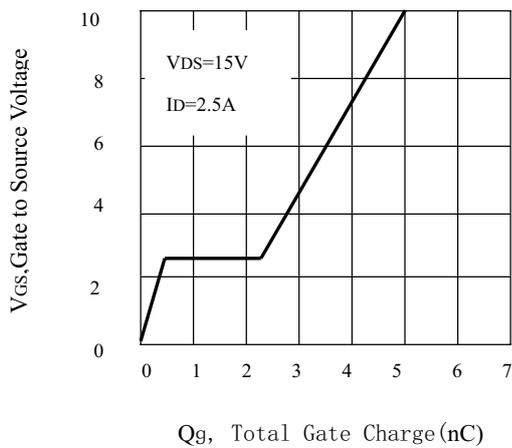
Tj, Junction Temperature (°C)
 Figure6.Breakdown Voltage Variation
 With Temperature



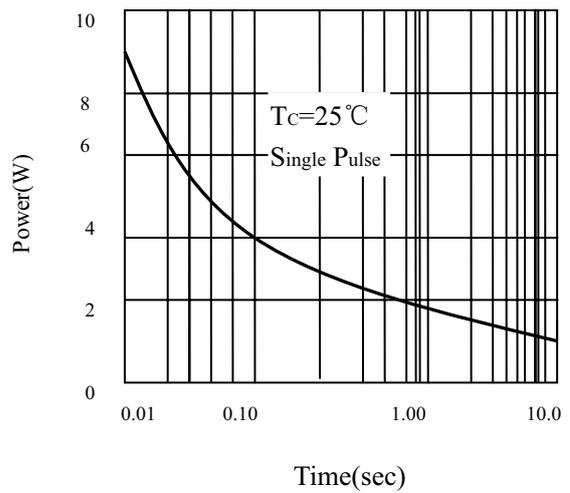
IDS, Drain-Source Current (A)
 Figure7.Transconductance Variation
 With Drain Current



VSD, Body Diode Forward Voltage
 Figure8.Body Diode Forward Voltage

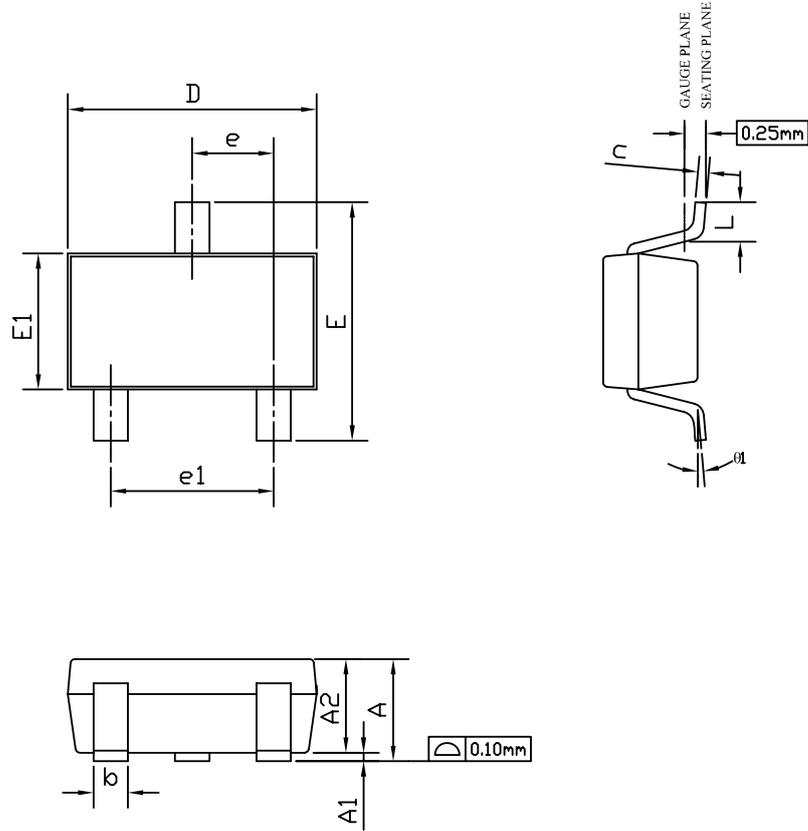


Qg, Total Gate Charge (nC)
 Figure9. Gate Charge

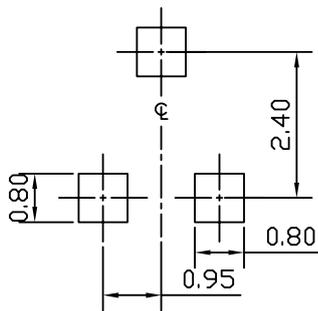


Document No.	PO-00001
Version	L

SOT23 PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	---	1.25	0.033	---	0.049
A1	0.00	---	0.13	0.000	---	0.005
A2	0.70	1.00	1.15	0.028	0.039	0.045
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	2.80	2.90	3.10	0.110	0.114	0.122
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.40	1.60	1.80	0.055	0.063	0.071
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
L	0.30	---	0.60	0.012	---	0.024
θ1	0°	5°	8°	0°	5°	8°

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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