

N- Channel Enhancement Mode MOSFET**◆ DESCRIPTION**

The MT7406 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

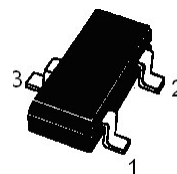
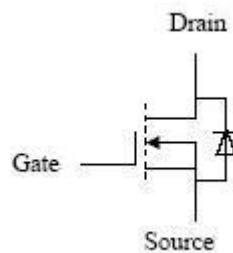
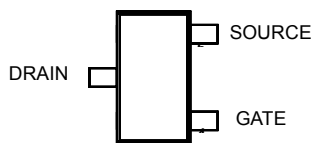
These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching, and low in-line power loss are needed in a very small outline surface mount package.

◆ FEATURES

- 20V/1.8A, $R_{DS(ON)}=60m\Omega@V_{GS}=4.5V$
- 20V/1.5A, $R_{DS(ON)}=85m\Omega@V_{GS}=2.5V$
- 20V/1.2A, $R_{DS(ON)}=140m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-323 (SC-70-3L) package design

◆ APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

◆ PIN CONFIGURATION

N- Channel Enhancement Mode MOSFET
◆ ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	1.8	A
	$T_C = 100^{\circ}\text{C}$		1.4	
Pulsed Drain Current		I_{DM}	10	A
Power Dissipation	$T_C = 25^{\circ}\text{C}$	P_D	0.35	W
	$T_C = 70^{\circ}\text{C}$		0.22	
Operating junction temperature range		T_J	-55 to 150	$^{\circ}\text{C}$
Storage temperature range		T_{STG}	- 55 to 150	$^{\circ}\text{C}$

◆ THERMAL RESISTANCE RATINGS

Thermal Resistance	Symbol	Maximum	Unit
Junction-to-Ambient	$R_{\theta JA}$	360	$^{\circ}\text{C/W}$

◆ ORDERING INFORMATION

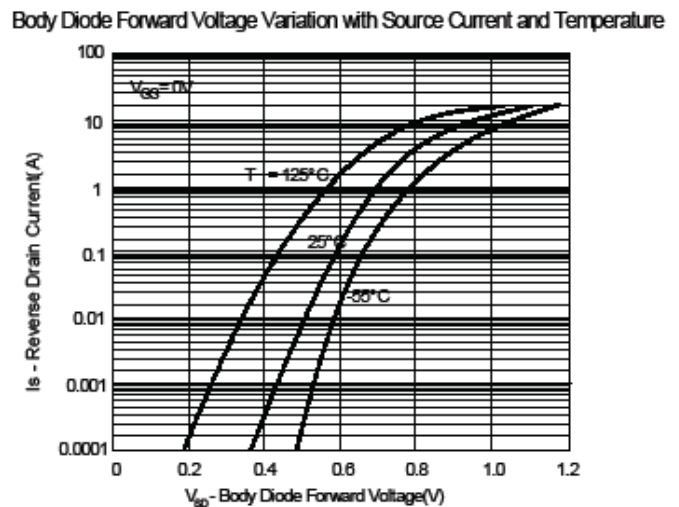
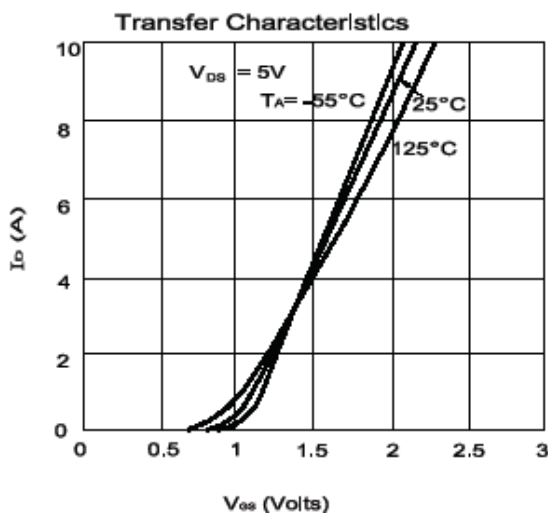
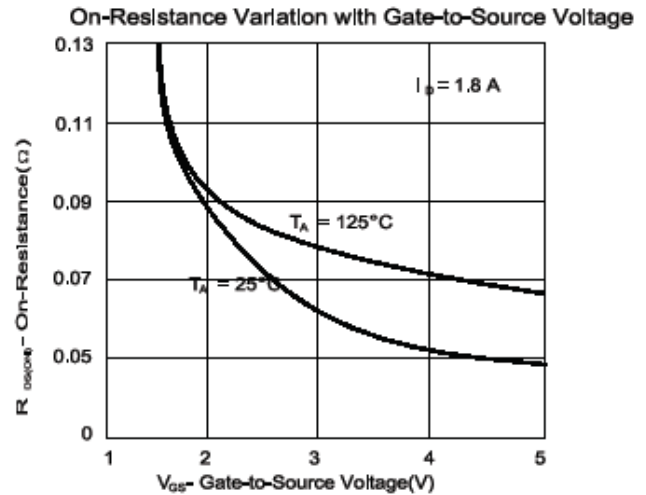
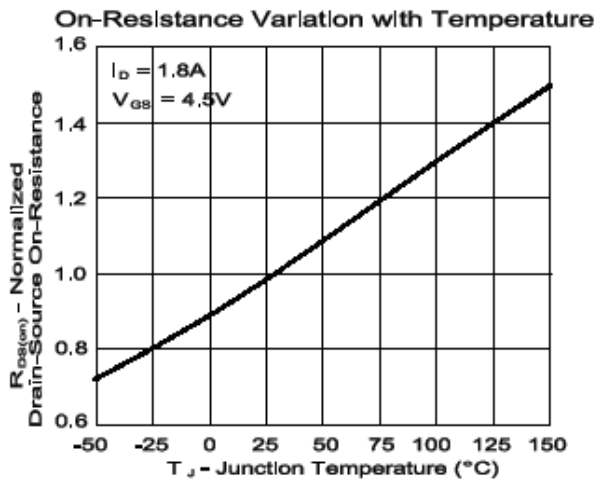
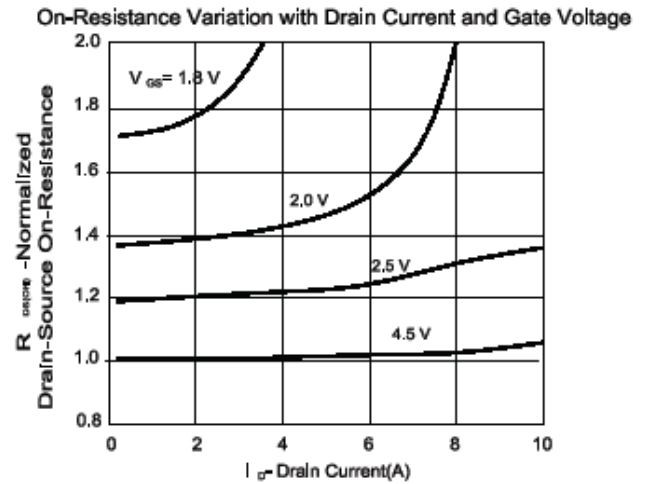
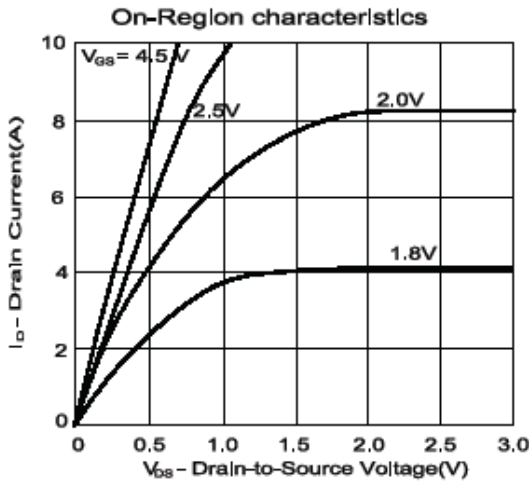
Device	Package	Shipping
MT7406	SOT-323	3000 PCS / Tape & Reel

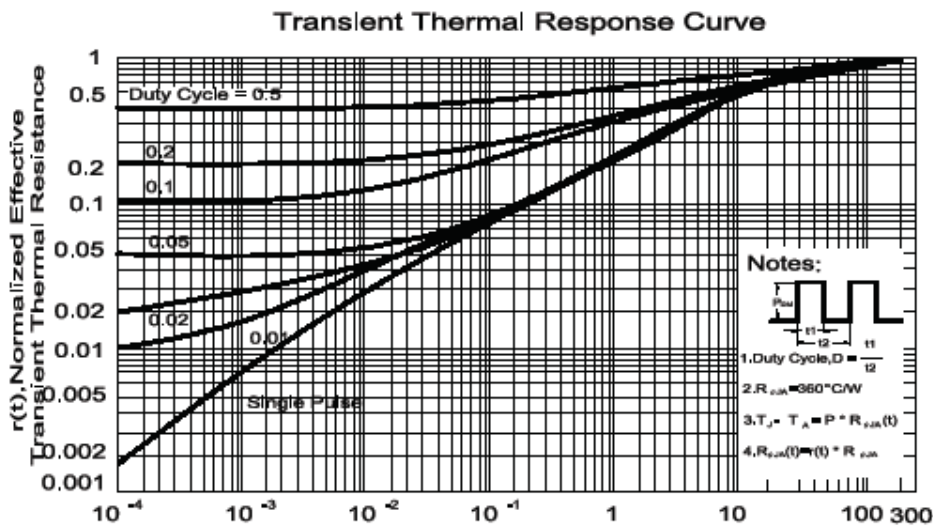
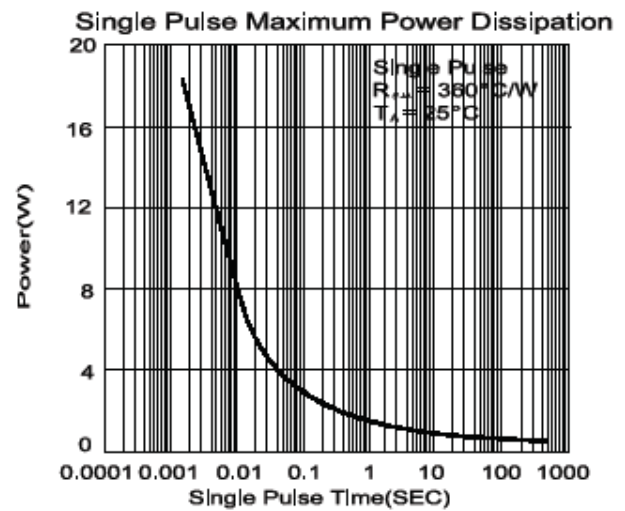
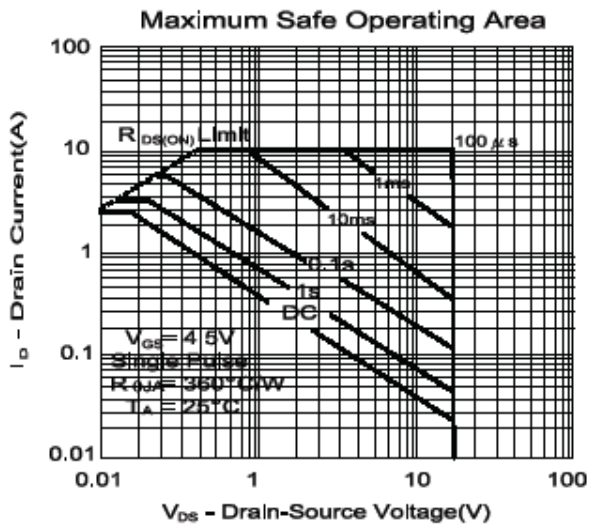
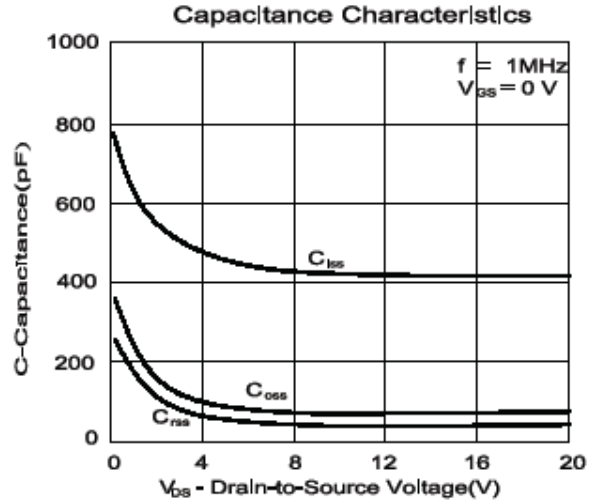
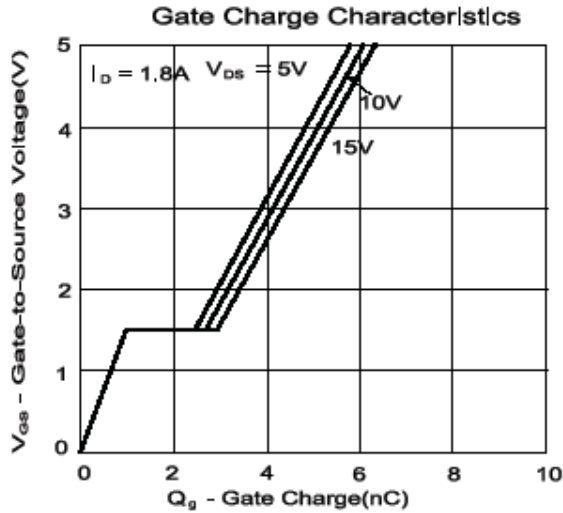
N- Channel Enhancement Mode MOSFET
◆ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ Unless otherwise noted)

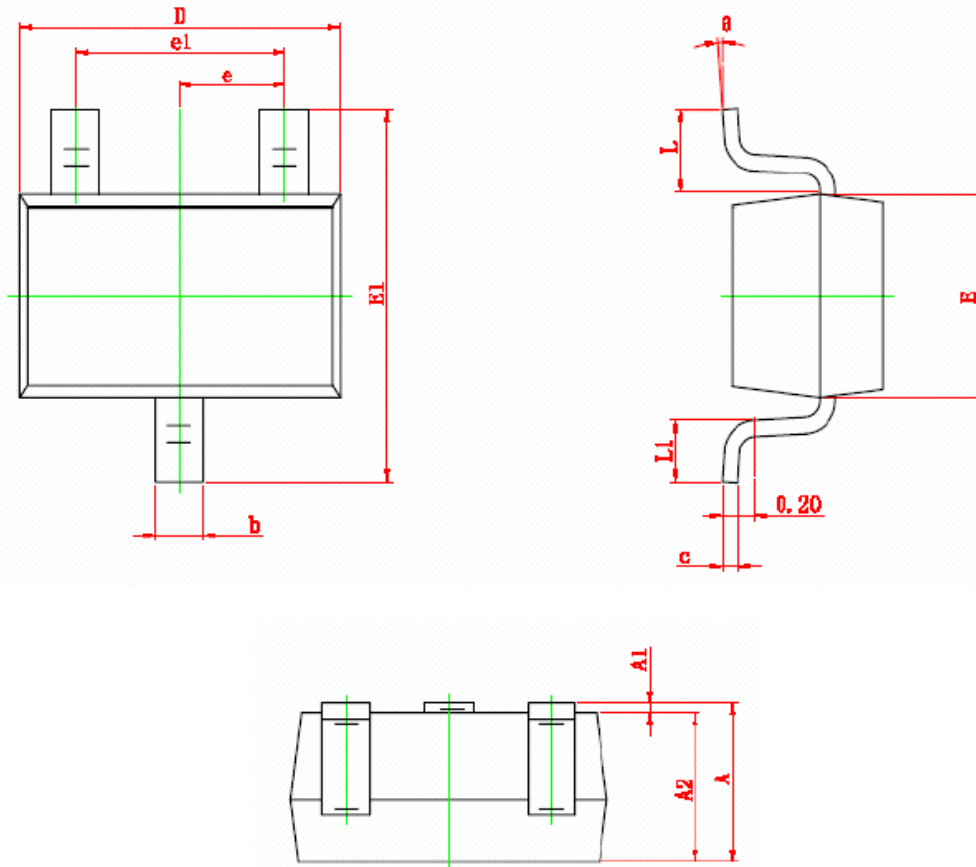
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D=250\mu A$	20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	0.4	0.8	1.2	V
Gate Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 12 V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16V, V_{GS} = 0 V$	-	-	1	μA
		$V_{DS}=16V, V_{GS} = 0 V,$ $T_J=125^\circ C$	-	-	10	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS}=5V, V_{GS}=4.5V$	10	-	-	A
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 4.5V, I_D=1.8A$	-	50	60	$m\Omega$
		$V_{GS}= 2.5V, I_D=1.5A$	-	60	85	
		$V_{GS}= 1.8V, I_D=1.2A$	-	82	140	
Forward Transconductance ¹	g_{fs}	$V_{DS}=10V, I_D=-1.8A$	-	5.5	-	S
Dynamic Parameters						
Input Cap.	C_{ISS}	$V_{DS}=10V, V_{GS}=0V$ $F=1MHz$	-	418	-	pF
Output Cap.	C_{OSS}		-	60	-	
Reverse Transfer Cap.	C_{RSS}		-	42	-	
Total Gate Charge ²	Q_g	$V_{DS}=0.5V_{(BR)DSS},$ $V_{GS}=4.5V, I_D=1.8A$	-	5.4	-	nC
Gate-Source Charge ²	Q_{gs}		-	0.7	-	
Gate-Drain Charge ²	Q_{gd}		-	1.7	-	
Turn-On Delay Time ²	$t_{d(on)}$	$V_{DS}=10V, I_D=1.0A,$ $V_{GS}=4.5V, R_{GS}=2.5\Omega$	-	2.7	-	ns
Rise Time ²	t_r		-	2.5	-	
Turn-Off Delay Time ²	$T_{d(off)}$		-	24	-	
Fall Time ²	t_f		-	3.2	-	
Source-Drain Diode Ratings and characteristics						
Continuous Current	I_S		-	-	0.9	V
Pulsed Current ³	I_{SM}		-	-	1.8	V
Diode Forward Voltage ¹	V_{SD}	$I_S= I_F, V_{GS}=0V$	-	-	1.0	V

Note :

1. Pulse test: $PW \leq 300\mu s$ duty cycle $\leq 2\%$.
2. Independent of operating temperature.
3. Pulse width limited by maximum junction temperature.

N- Channel Enhancement Mode MOSFET
◆ TYPICAL CHARACTERISTICS


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◆ PHYSICAL DIMENSIONS

3-Pin surface Mount SOT-323


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°