

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

The MT2502 is the N-Channel logic enhancement mode power field effect transistor are produced using high cell density, DMOS trench technology.

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

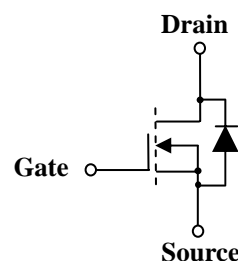
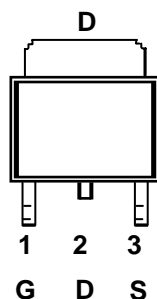
These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other Battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

**◆ FEATURES**

- 100V/10A,  $R_{DS(ON)} = 150m\Omega @ V_{GS} = 10V$
- 100V/10A,  $R_{DS(ON)} = 175m\Omega @ V_{GS} = 5V$
- Super high density cell design for extremely ultra low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TO-252 package design

**◆ APPLICATIONS**

- POWER Management
- Portable Equipment
- DC/DC Converter
- Load Switch
- DSC

**◆ PIN CONFIGURATION**
**TO-252(Top Site)**


**N- Channel Enhancement Mode MOSFET**
**◆ ABSOLUTE MAXIMUM RATINGS**

 (T<sub>A</sub>=25°C Unless Otherwise Noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V <sub>DS</sub>	100	V
Gate-Source Voltage		V <sub>GS</sub>	±30	V
Continuous Drain Current	T <sub>A</sub> = 25°C	I <sub>D</sub>	10	A
	T <sub>A</sub> = 100°C		7	
Pulsed Drain Current <sup>A</sup>		I <sub>DM</sub>	40	A
Avalanche Current		I <sub>AS</sub>	12	A
Avalanche Energy(L=0.1mH, I <sub>D</sub> =12A,R <sub>G</sub> =25Ω)		E <sub>AS</sub>	7.2	mJ
Repetitive Avalanche Energy <sup>B</sup> (L=0.05mH)		E <sub>AR</sub>	3.6	
Power Dissipation	T <sub>A</sub> = 25°C	P <sub>D</sub>	35	W
	T <sub>A</sub> = 100°C		15	
Operating junction temperature range		T <sub>J</sub>	- 55 to 175	°C
Storage temperature range		T <sub>STG</sub>	- 55 to 175	°C

Note <sup>A</sup>: Pulse width limited by maximum junction temperature.  
<sup>B</sup>: Duty cycle ≤ 1%.

**◆ THERMAL RESISTANCE RATINGS**

Thermal Resistance	Symbol	Maximum	Unit
Junction-to-Case	R <sub>θJC</sub>	4.2	°C/W
Junction-to-Ambient	R <sub>θJA</sub>	62.5	°C/W

**◆ ORDERING INFORMATION**

Device	Package	Shipping
MT2501	TO-252	2,500 PCS / Tape & Reel

**N- Channel Enhancement Mode MOSFET**
**◆ ELECTRICAL CHARACTERISTICS**

 (T<sub>A</sub>=25°C Unless Otherwise Noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	100	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250μA	1	2	3	V
Gate Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ± 30V	-	-	±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V	-	-	1	μA
		V <sub>DS</sub> = 70V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C	-	-	25	
On-State Drain Current <sup>A</sup>	I <sub>D(ON)</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V	10	-	-	A
Drain-Source On Resistance <sup>A</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A	-	130	150	mΩ
		V <sub>GS</sub> = 5V, I <sub>D</sub> = 10A	-	150	175	
Forward Trans conductance <sup>A</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 10A	-	8	-	S
<b>Dynamic Parameters</b>						
Input Cap.	C <sub>iss</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz	-	1070	-	pF
Output Cap.	C <sub>oss</sub>		-	52	-	
Reverse Transfer Cap.	C <sub>rss</sub>		-	40	-	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 15mV, V <sub>DS</sub> = 0V, f = 1MHz	-	2.0	-	Ω
Total Gate Charge <sup>A,B</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 80V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A	-	18.8	-	nC
Gate-Source Charge <sup>A,B</sup>	Q <sub>gs</sub>		-	3.8	-	
Gate-Drain Charge <sup>A,B</sup>	Q <sub>gd</sub>		-	4.5	-	
Turn-On Time <sup>A,B</sup>	T <sub>D(ON)</sub>	V <sub>DS</sub> = 50V, I <sub>D</sub> = 1A, V <sub>GS</sub> = 10V, R <sub>GS</sub> = 6Ω	-	15	-	nS
Rise Time <sup>A,B</sup>	t <sub>r</sub>		-	35	-	
Turn-Off Time <sup>A,B</sup>	T <sub>D(OFF)</sub>		-	25	-	
Fail Time <sup>A,B</sup>	t <sub>f</sub>		-	25	-	
<b>Source-Drain Diode Ratings And Characteristics</b>						
Continuous Current	I <sub>S</sub>		-	-	10	A
Pulsed Current <sup>C</sup>	I <sub>SM</sub>		-	-	40	
Forward Voltage <sup>A</sup>	V <sub>SD</sub>	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0V	-	-	1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 10A, dI <sub>F</sub> /dt=100A/μS	-	120	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	520	-	nC

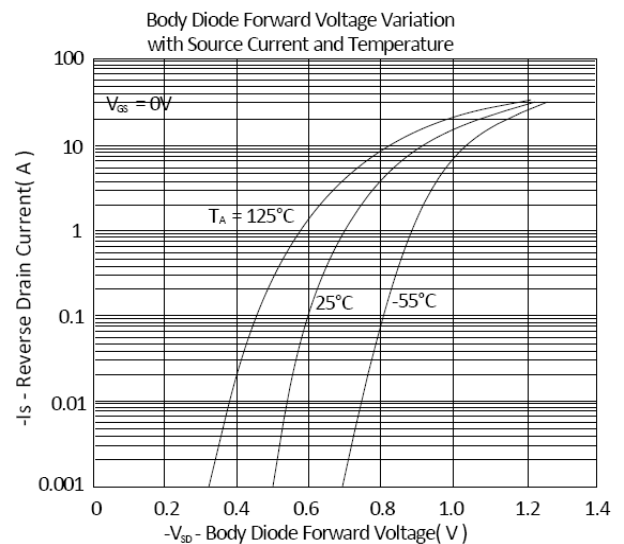
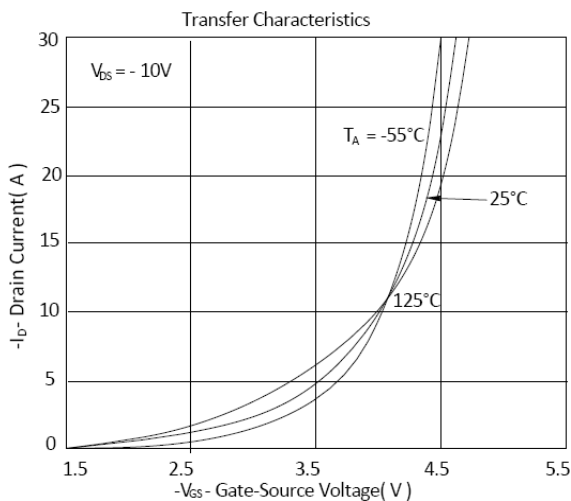
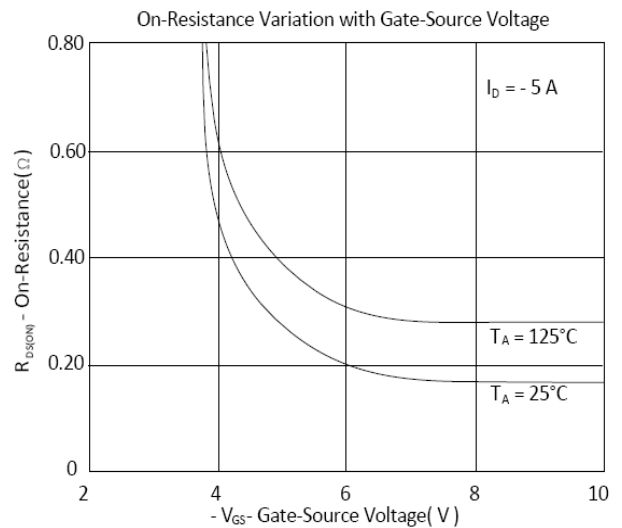
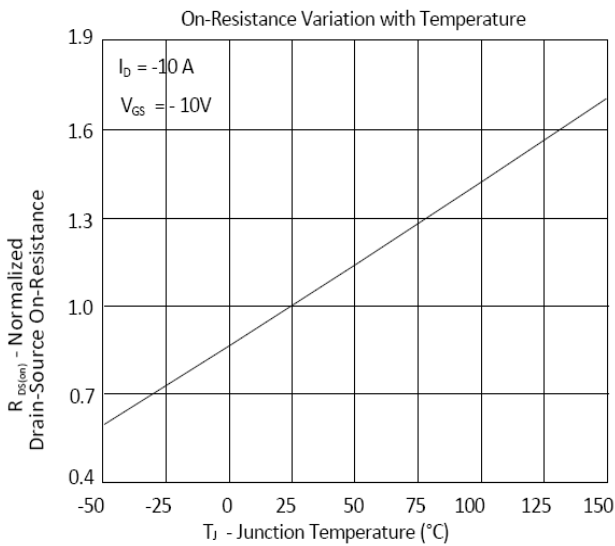
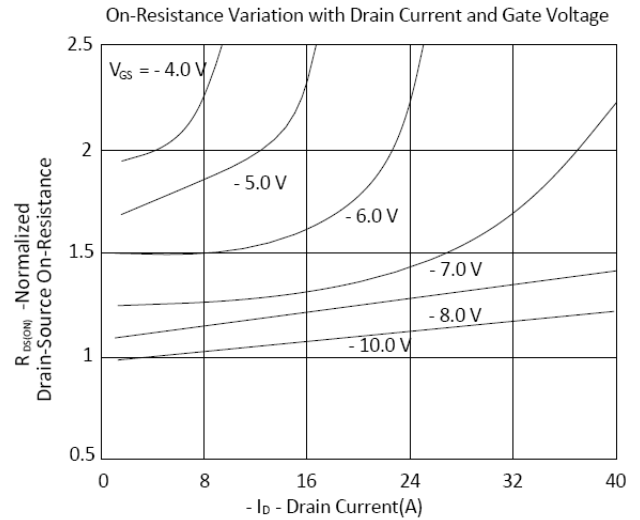
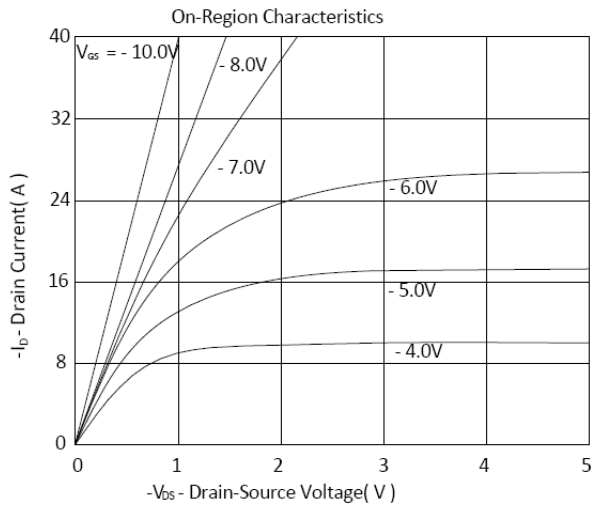
 Note <sup>A</sup>: Pulse test: Pulse width ≤ 300μsec, Duty Cycle ≤ 2%

<sup>B</sup>: Independent of operating temperature

<sup>C</sup>: Pulse width limited by maximum junction temperature.

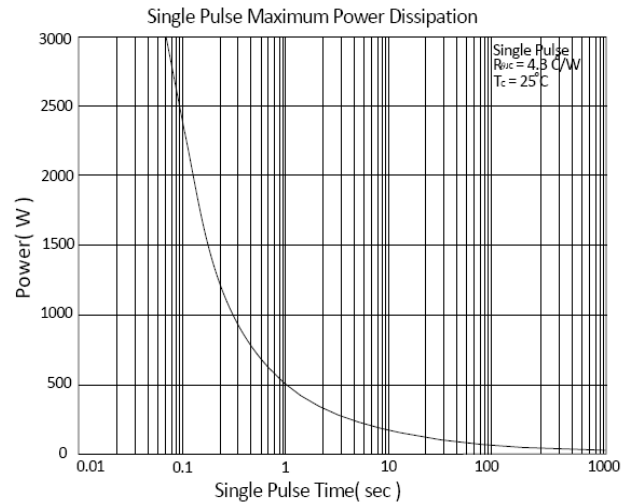
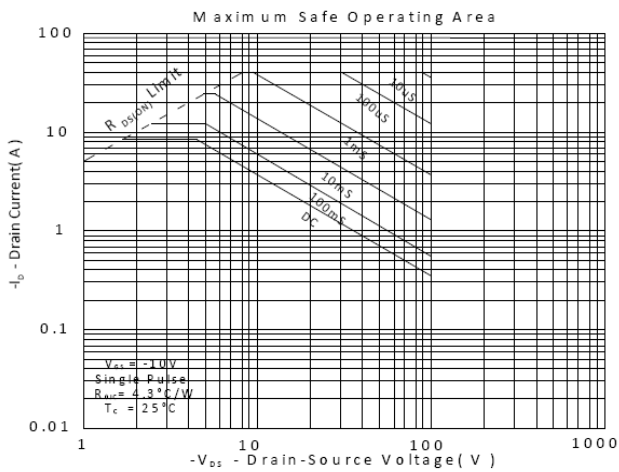
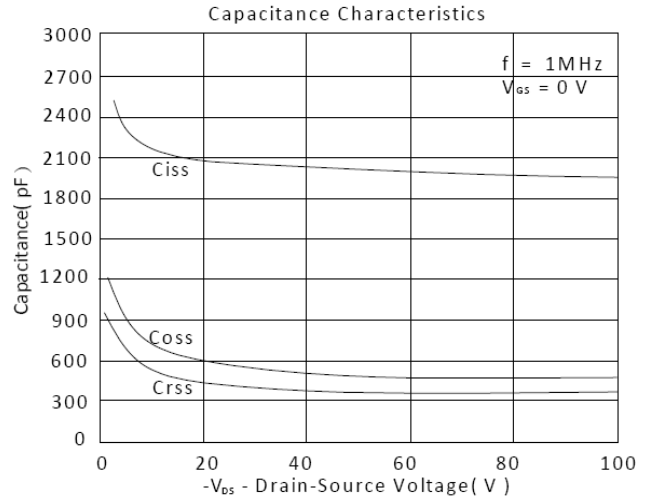
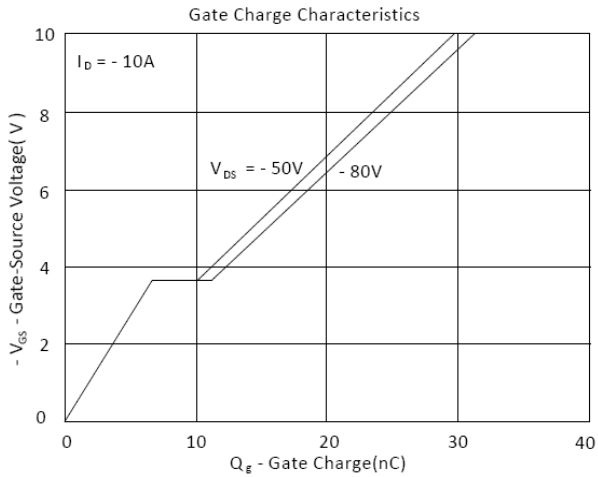
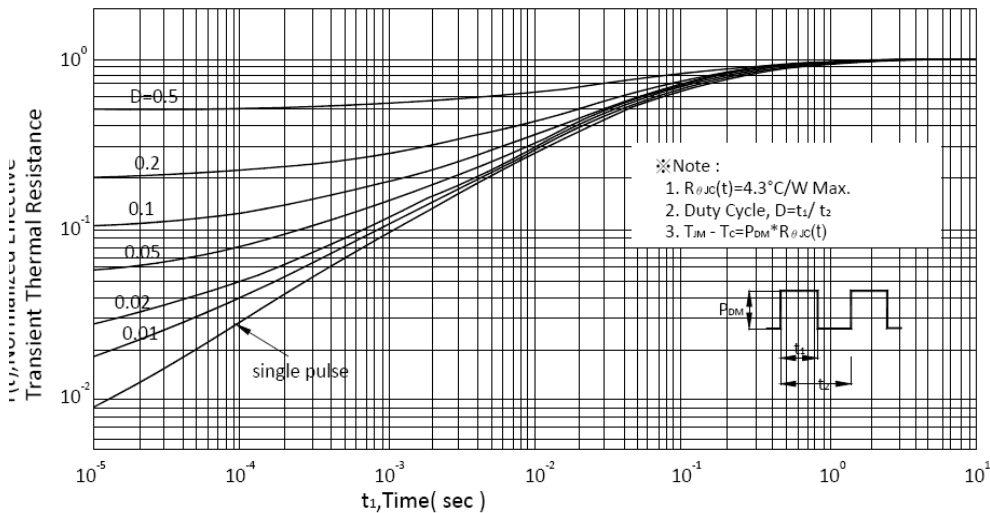
**N- Channel Enhancement Mode MOSFET**
**◆ TYPICAL CHARACTERISTICS**

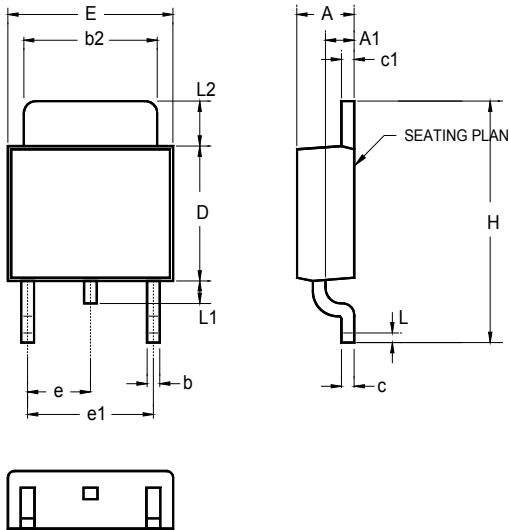
(25°C Unless Noted)



**N- Channel Enhancement Mode MOSFET**
**◆ TYPICAL CHARACTERISTICS**

(25°C Unless Noted)


**Transient Thermal Response Curve**


**N- Channel Enhancement Mode MOSFET**
**◆ PHYSICAL DIMENSIONS**
**3-Pin Surface Mount TO-252 (B)**


	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.086	-	0.094	2.18	-	2.39
A1	0.040	-	0.050	1.02	-	1.27
b	-	0.024	-	-	0.61	-
b2	0.205	-	0.215	5.21	-	5.46
c	0.018	-	0.023	0.46	-	0.58
c1	0.018	-	0.023	0.46	-	0.58
D	0.210	-	0.220	5.33	-	5.59
E	0.250	-	0.265	6.35	-	6.73
e	0.090 BSC			2.29 BSC		
e1	0.180 BSC			4.58 BSC		
H	0.370	-	0.410	9.40	-	10.41
L	0.020	-	-	0.51	-	-
L1	0.025	-	0.040	0.64	-	1.02
L2	0.060	-	0.080	1.52	-	2.03