

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

The MT2501 is the P-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.

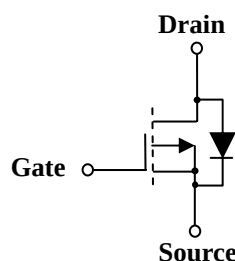
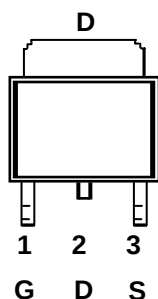
These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other Battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

◆ FEATURES

- -100V/-10A, $R_{DS(ON)} = 205m\Omega$ @ $V_{GS} = -10V$
- -100V/-10A, $R_{DS(ON)} = 225m\Omega$ @ $V_{GS} = -7V$
- 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)**

P- Channel Enhancement Mode MOSFET
◆ ABSOLUTE MAXIMUM RATINGS

(T_A=25°C Unless Otherwise Noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V _{DS}	-100	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _A = 25°C	I _D	-10	A
	T _A = 100°C		-7	
Pulsed Drain Current ^A		I _{DM}	-40	A
Avalanche Current		I _{AS}	-12	A
Avalanche Energy (L=0.1mH, I _D = -12A, R _G =25Ω)		E _{AS}	7.2	mJ
Repetitive Avalanche Energy ^B (L=0.05mH)		E _{AR}	3.6	
Power Dissipation	T _A = 25°C	P _D	35	W
	T _A = 100°C		15	
Operating junction temperature range		T _J	- 55 to 175	°C
Storage temperature range		T _{STG}	- 55 to 175	°C

Note ^A: Pulse width limited by maximum junction temperature.
^B: Duty cycle ≤ 1%.

◆ THERMAL RESISTANCE RATINGS

Thermal Resistance	Symbol	Maximum	Unit
Junction-to-Case	R _{θJC}	4.3	°C/W
Junction-to-Ambient	R _{θJA}	62.5	°C/W

◆ ORDERING INFORMATION

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

◆ ELECTRICAL CHARACTERISTICS

(T_A=25°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 = -250μA	-100	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D = -250μA	-1	-2	-3	V
Gate Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ± 20V	-	-	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -80V, V _{GS} = 0 V	-	-	-1	μA
		V _{DS} =-70V, V _{GS} = 0V, T _J = 125 °C	-	-	-25	
On-State Drain Current ^A	I _{D(ON)}	V _{DS} = -5V, V _{GS} = -10V	-10	-	-	A
Drain-Source On Resistance ^A	R _{DS(ON)}	V _{GS} = -10V, I _D = -10A	-	182	205	mΩ
		V _{GS} = -7 V, I _D = -10A	-	190	225	
Forward Trans conductance ^A	g _{fs}	V _{DS} = -5V, I _D = -10A	-	7	-	S
Dynamic Parameters						
Input Cap.	C _{iSS}	V _{DS} = -25V, V _{GS} = 0V, f = 1MHz	-	2018	-	pF
Output Cap.	C _{oSS}		-	500	-	
Reverse Transfer Cap.	C _{rSS}		-	352	-	
Gate Resistance	R _g	V _{GS} = 15mV, V _{DS} = 0V, f = 1MHz	-	4.5	-	Ω
Total Gate Charge ^{A,B}	Q _g	V _{DS} = -80V, V _{GS} =- 10V, I _D = -10A	-	31	-	nC
Gate-Source Charge ^{A,B}	Q _{gs}		-	6.3	-	
Gate-Drain Charge ^{A,B}	Q _{gd}		-	4.5	-	
Turn-On Time ^{A,B}	T _{D(ON)}	V _{DS} = -10V, I _D = -1A, V _{Gs} = -10V, R _{GS} = 6Ω	-	12	-	nS
Rise Time ^{A,B}	t _r		-	55	-	
Turn-Off Time ^{A,B}	T _{D(OFF)}		-	40	-	
Fail Time ^{A,B}	t _f		-	40	-	
Source-Drain Diode Ratings And Characteristics						
Continuous Current	I _S		-	-	-10	A
Pulsed Current ^C	I _{SM}		-	-	-40	
Forward Voltage ^A	V _{SD}	I _F = I _S , V _{GS} = 0V	-	-	1.3	V
Reverse Recovery Time	t _{rr}	I _F = -5A , dI _F /dt=100A/μS	-	70	-	nS
Reverse Recovery Charge	Q _{rr}		-	420	-	nC

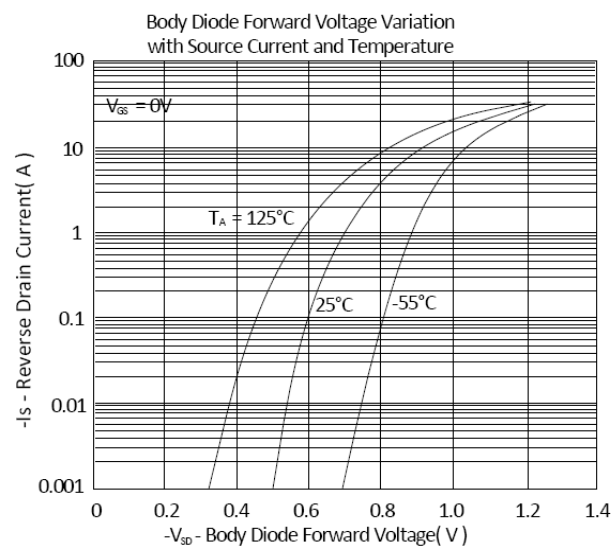
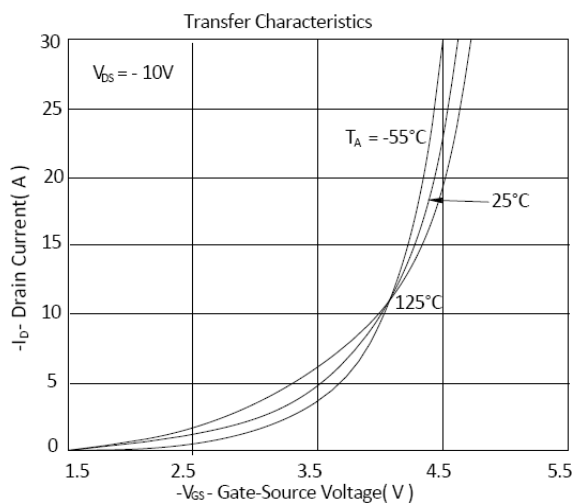
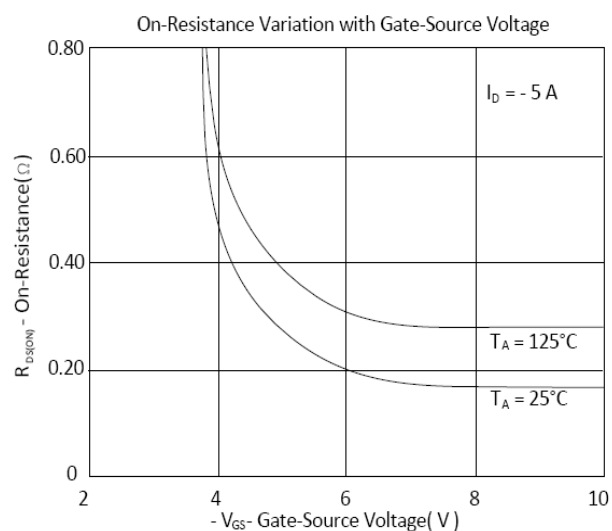
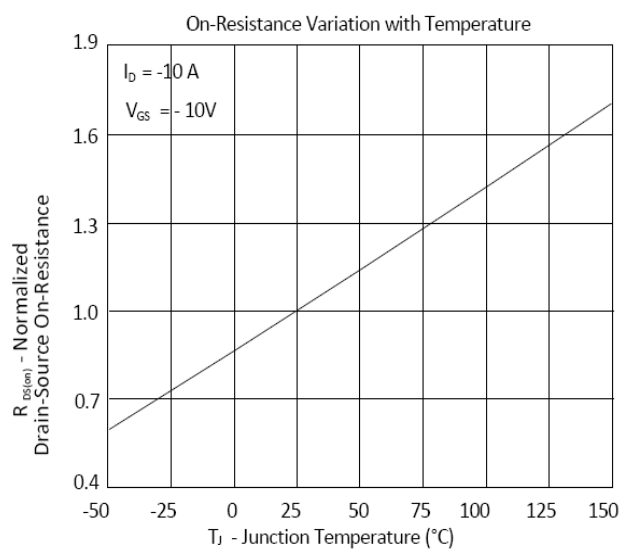
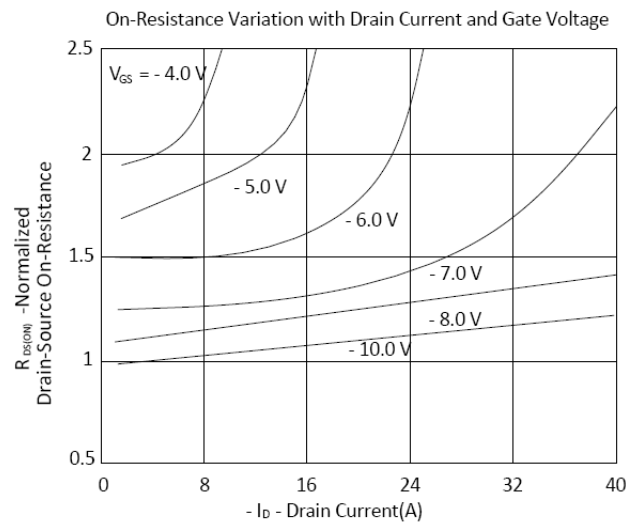
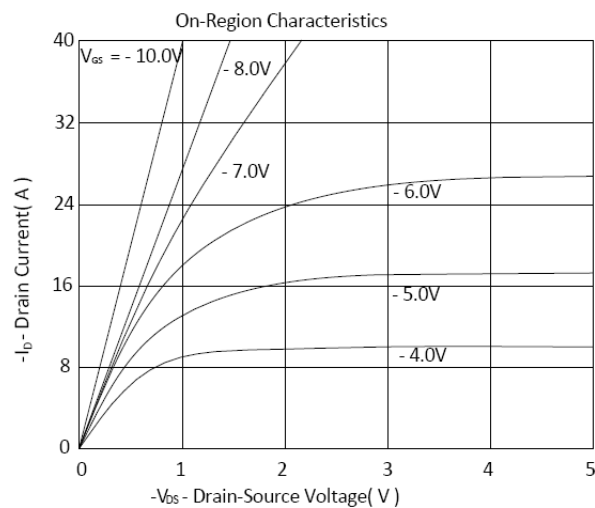
Note ^A: Pulse test: Pulse width ≤ 300μsec, Duty Cycle ≤ 2%

^B: Independent of operating temperature

^C: Pulse width limited by maximum junction temperature.

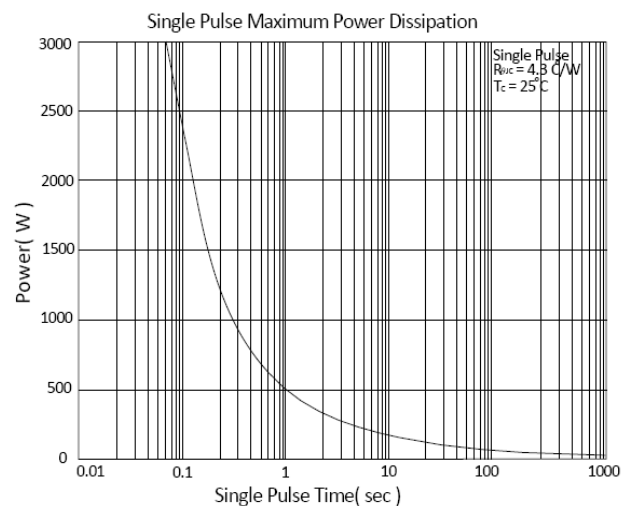
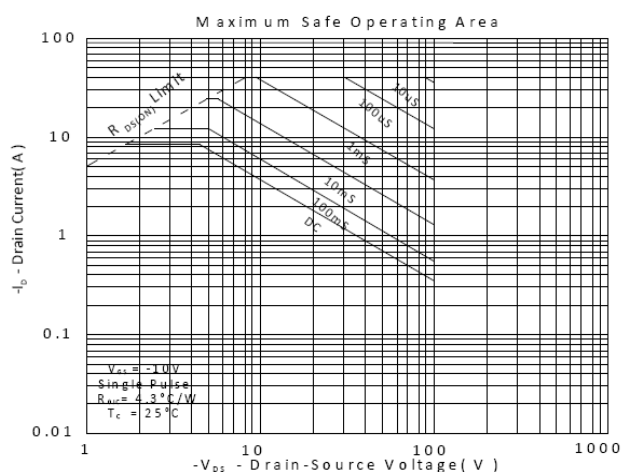
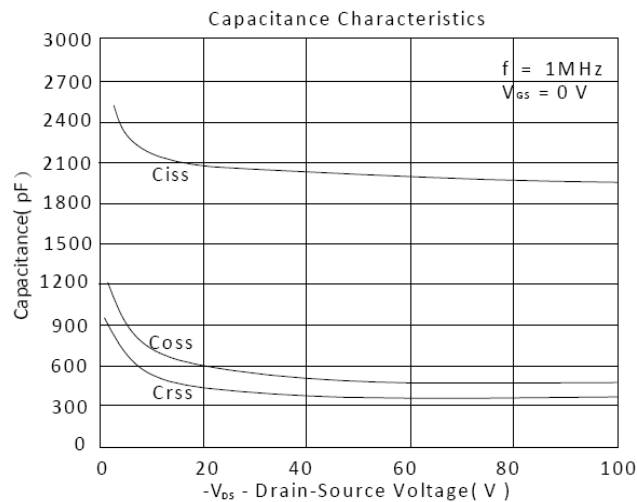
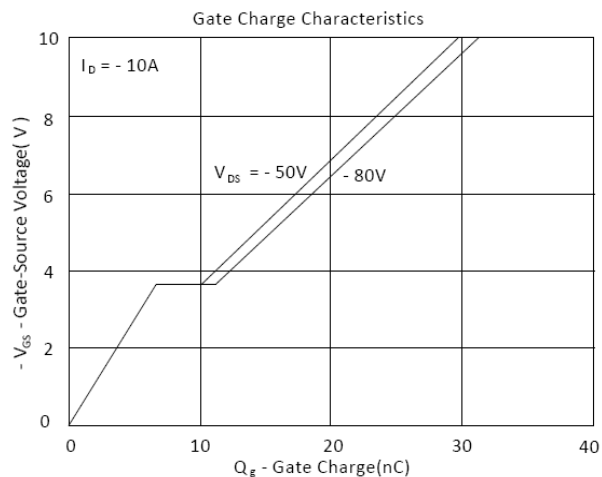
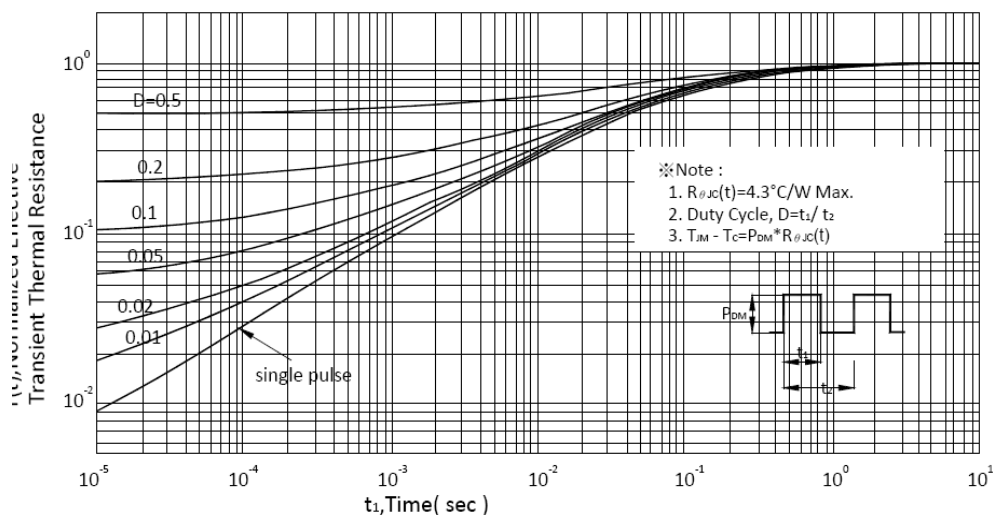
P- Channel Enhancement Mode MOSFET
◆ TYPICAL CHARACTERISTICS

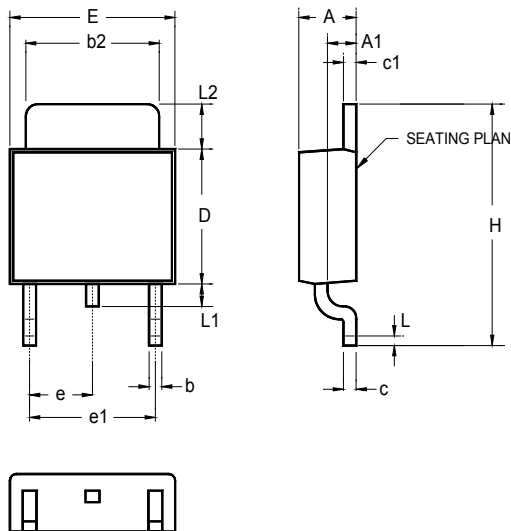
(25°C Unless Noted)



P- Channel Enhancement Mode MOSFET
◆ TYPICAL CHARACTERISTICS

(25°C Unless Noted)


Transient Thermal Response Curve


P- 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