P- Channel Enhancement Mode MOSFET

◆ DESCRIPTION

The MT2561 is the P-Channel logic enhancement mode power field effect transistor is 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

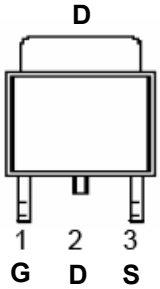
- -60V/-7A, $R_{DS(ON)}$ = 90mΩ @ V_{GS} = -10V
- -60V/-6A, $R_{DS(ON)}$ = 135mΩ @ V_{GS} = -4.5V
- Super high density cell design for extremely ultra low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TO-252 package design

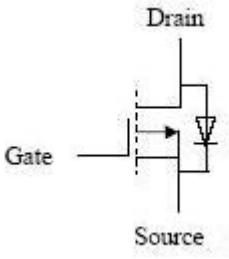
◆ APPLICATIONS

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

◆ PIN CONFIGURATION

TO-252(Top Site)





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◆ ABSOLUTE MAXIMUM RATINGS

(T_A=25℃ Unless Otherwise Noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A = 25℃	I_D	-12	A
	T_A = 70℃		-10	
Pulsed Drain Current [A]		I_{DM}	-30	A
Power Dissipation	T_A = 25℃	P_D	28	W
	T_A = 70℃		18	
Operating junction temperature range		T_J	- 55 to 150	°C
Storage temperature range		T_{STG}	- 55 to 150	°C
Lead Temperature (1/16” form case for 10 Sec.)		T_L	275	°C

Note A: Pulse width limited by maximum junction temperature.

Note B: Duty cycle ≤ 1%.

◆ THERMAL RESISTANCE RATINGS

Thermal Resistance	Symbol	Maximum	Unit
Junction-to-Case	$R_{\theta JC}$	3	°C/W
Junction-to-Ambient	$R_{\theta JA}$	75	°C/W

◆ ORDERING INFORMATION

Device	Package	Shipping
MT2561	TO-252	2,500 PCS / Tape & Reel

◆ ELECTRICAL CHARACTERISTICS

(T_A=25℃ 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	-60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = -250μA	-1.0	-2.0	-3.0	V
Gate Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ± 20V	-	-	±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -48V, V_{GS} = 0 V	-	-	-1	μA
		V_{DS} =-44V, V_{GS} = 0V, T_J = 125°C	-	-	-10	
On-State Drain Current [C]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V	-32	-	-	A
Drain-Source On Resistance [C]	$R_{DS(ON)}$	V_{GS} = -10V, I_D = -7A	-	100	135	mΩ
		V_{GS} = -4.5V, I_D = -6A	-	70	90	
Forward Trans conductance [C]	g_{fs}	V_{DS} = -10V, I_D = -7A	-	9	-	S
Dynamic Parameters						
Input Cap.	C_{iss}	V_{DS} = -30V, V_{GS} = 0V, f = 1MHz	-	760	-	pF
Output Cap.	C_{oss}		-	90	-	
Reverse Transfer Cap.	C_{rss}		-	40	-	
Total Gate Charge [D]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = -10V, I_D = -7A	-	15	-	nC
Gate-Source Charge [D]	Q_{gs}		-	2.5	-	
Gate-Drain Charge [D]	Q_{gd}		-	3.0	-	
Turn-On Time [D]	$T_{D(ON)}$	V_{DS} = -20V, I_D = -1A, V_{GS} = -10V, R_G = 6Ω	-	7	14	nS
	t_r		-	10	20	
Turn-Off Time [D]	$T_{D(OFF)}$		-	19	34	
	t_f		-	12	22	
Source-Drain Diode Ratings And Characteristics						
Continuous Current	I_S		-	-	-1.3	A
Pulsed Current [E]	I_{SM}		-	-	-2.6	
Forward Voltage [C]	V_{SD}	I_F = I_S , V_{GS} = 0V	-	-	-1	V
Reverse Recovery Time	t_{rr}	I_F =-7A, dI/dt=100A/μS	-	15.5	-	nS
Reverse Recovery Charge	Q_{rr}		-	7.9	-	nC

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

Note D: Independent of operating temperature.

Note E: Pulse width limited by maximum junction temperature.

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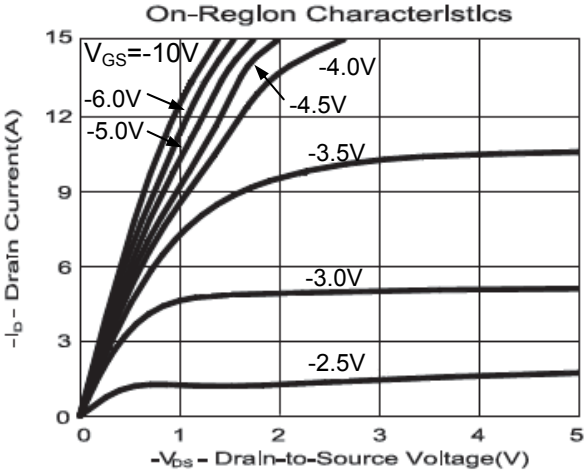
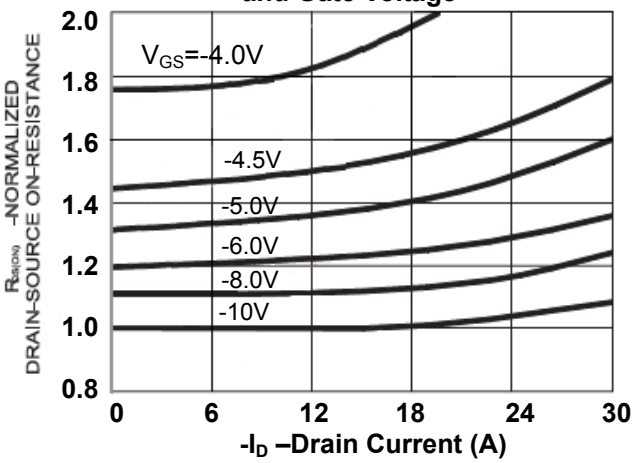
◆ TYPICAL CHARACTERICTICS (25℃ Unless Noted)

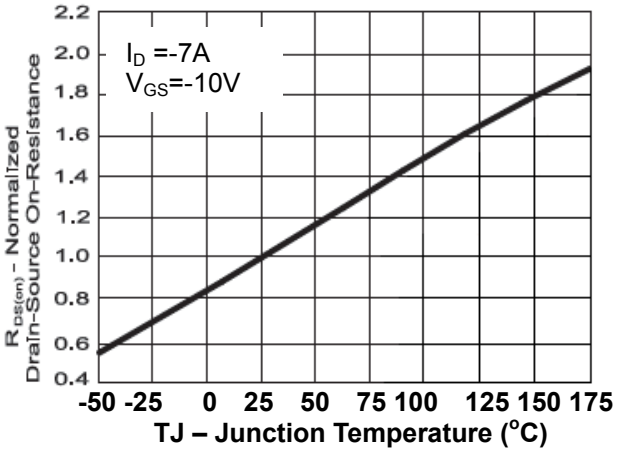
On-Reglon Characterlstlcs



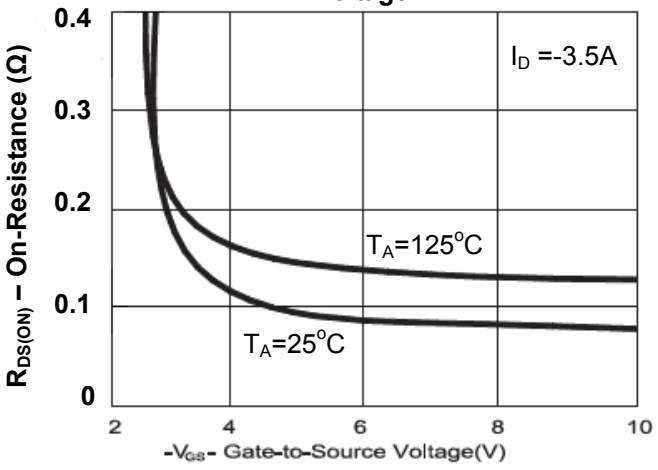
On-Resistance Variation with Drain Current and Gate Voltage



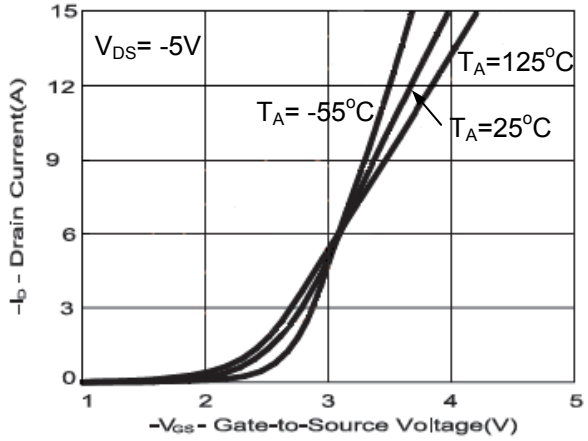
On-Resistance Variation with Temperature



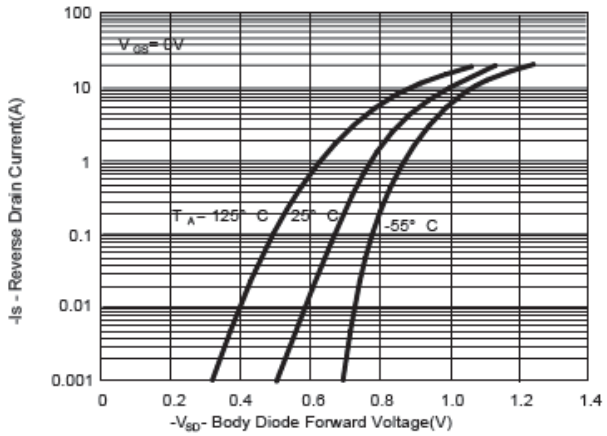
On-Resistance Variation with Gate-to-Source Voltage.



Transfer Characteristics

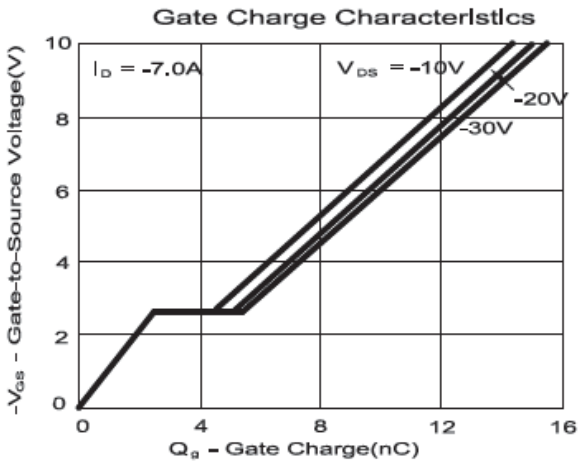


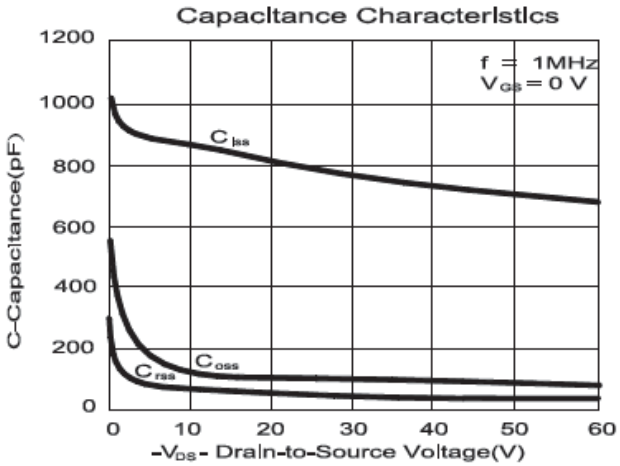
Body Diode Forward Voltage Variation with Source Current and Temperature

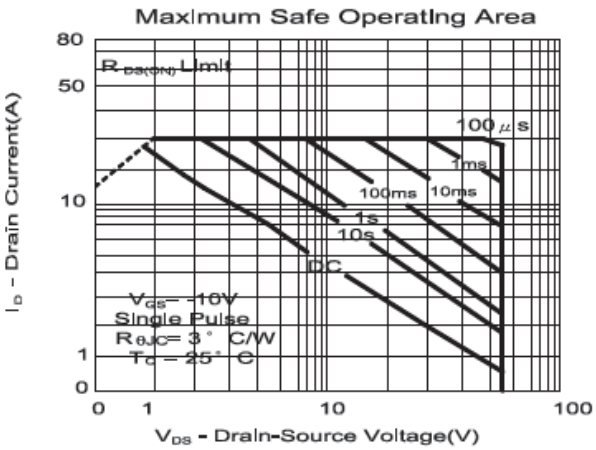


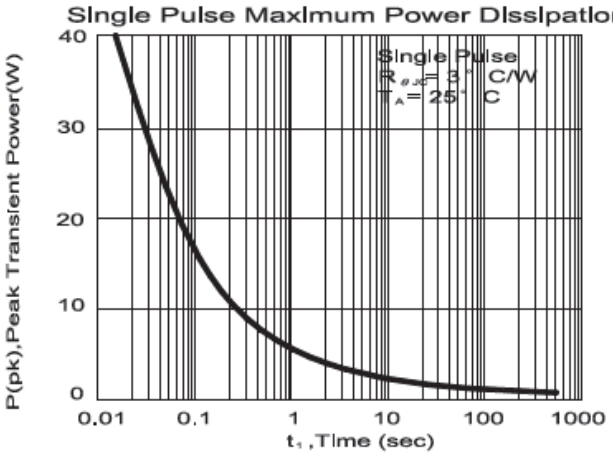
◆ TYPICAL CHARACTERICTICS

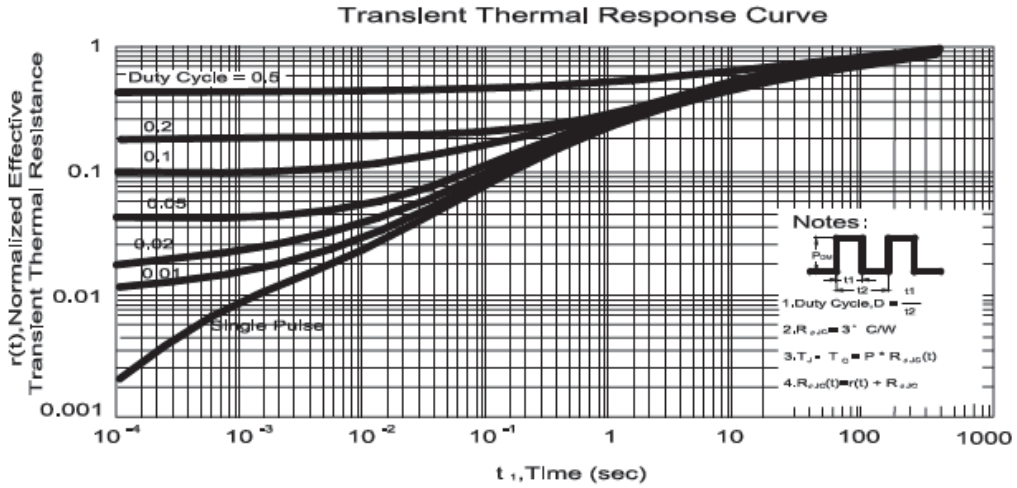
(25℃ Unless Noted)





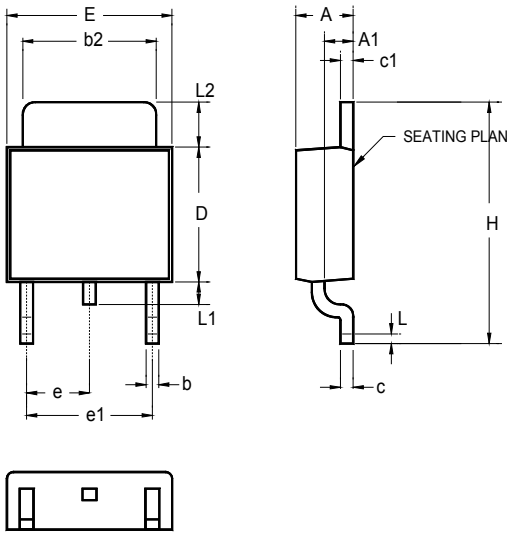






◆ PHYSICAL DIMENSIONS

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