



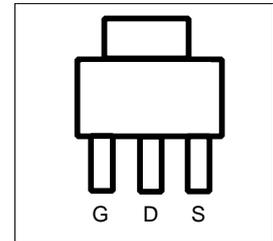
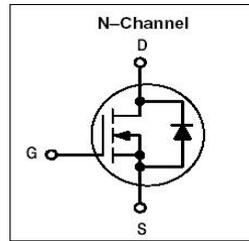
150V/4A N-Channel Advanced Power MOSFET

General Features

- $V_{DS} = 150V, I_D = 4.0A$
 $R_{DS(ON)} < 160m\Omega @ V_{GS}=10V$
- High density cell design for ultra low R_{dson}
- Fully Characterized Avalanche Voltage and Current

Application

- Power switching application
- Hard switched and high frequency circuits



SOT-223

Order Information

Product	Package	Marking	Packing
PTH150N04	SOT-223	PTH150N04	2500PCS/Reel

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	4.0	A
Drain Current-Pulsed ^(Note 1)	I_{DM}	16.0	A
Maximum Power Dissipation	P_D	4	W
Maximum Operating Temperature	T_J	150	$^\circ C$
Storage Temperature Range	T_{STG}	-55 To 150	$^\circ C$
Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	31.2	$^\circ C/W$



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Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	150		-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=150V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.5	2.0	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4.0A$	-	-	160	m Ω
Forward Transconductance	gfs	$V_{DS}=5V, I_D=4.0A$	-	5.0	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	902	-	PF
Output Capacitance	C_{oss}		-	116	-	PF
Reverse Transfer Capacitance	C_{rss}		-	70	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=75V, I_D=1A,$ $V_{GS}=10V, R_G=6.0\Omega$ $R_L=75\Omega$	-	8.1	-	nS
Turn-on Rise Time	t_r		-	10.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	19.7	-	nS
Turn-Off Fall Time	t_f		-	14.9	-	nS
Total Gate Charge	Q_g	$V_{DS}=75V, I_D=1.5A,$ $V_{GS}=10V$	-	19.0	-	nC
Gate-Source Charge	Q_{gs}		-	5.6	-	nC
Gate-Drain Charge	Q_{gd}		-	6.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=4.0A$	-	-	1.2	V

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production



Typical Characteristics

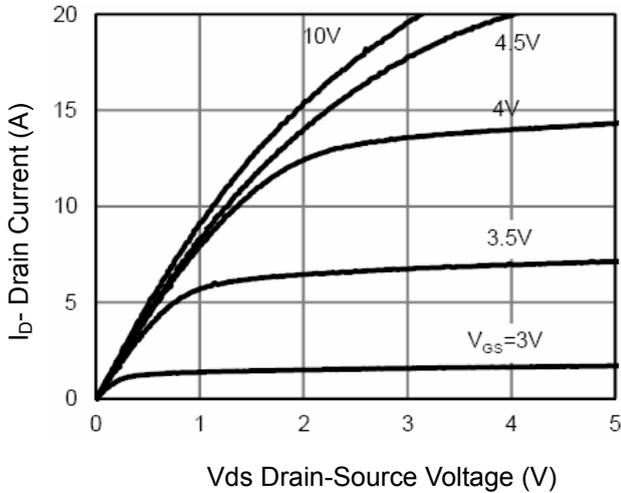


Figure 1 Output Characteristics

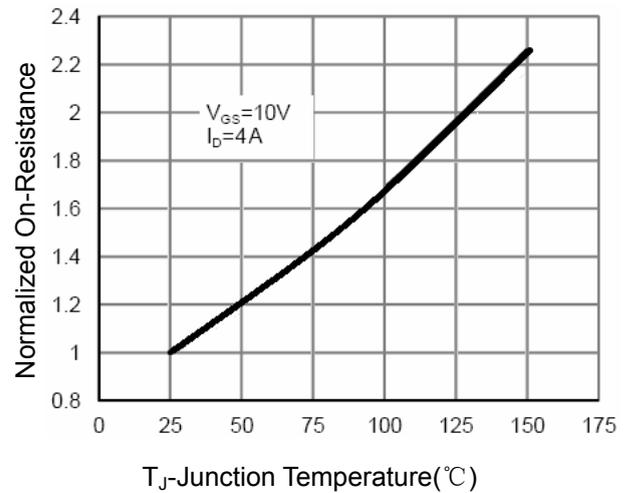


Figure 4 Rdson- Junction Temperature

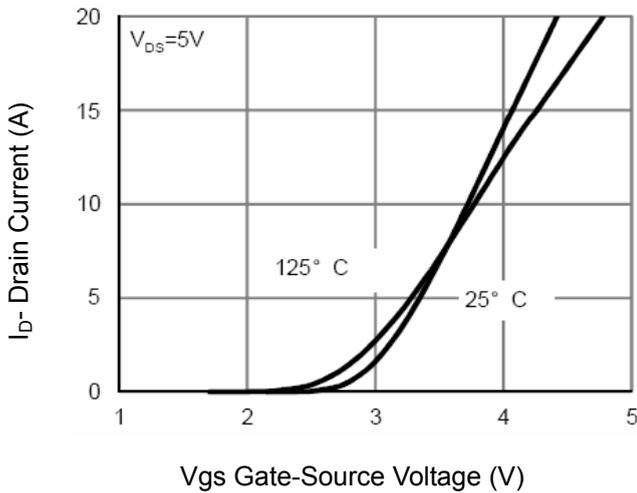


Figure 2 Transfer Characteristics

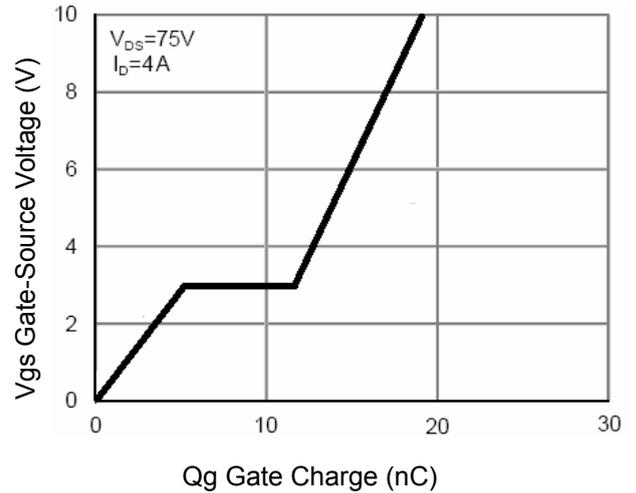


Figure 5 Gate Charge

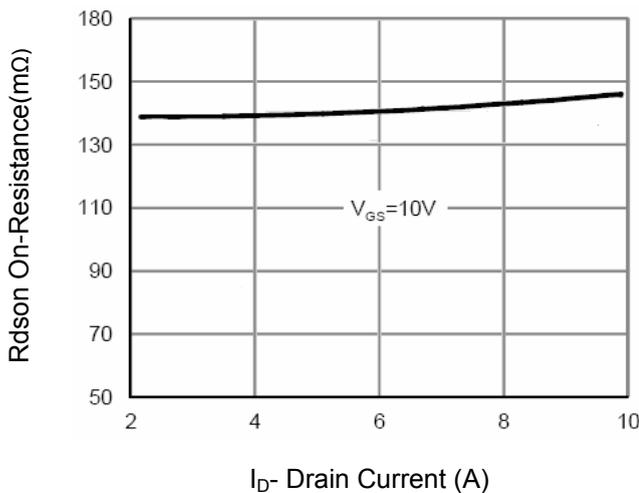


Figure 3 Rdson- Drain Current

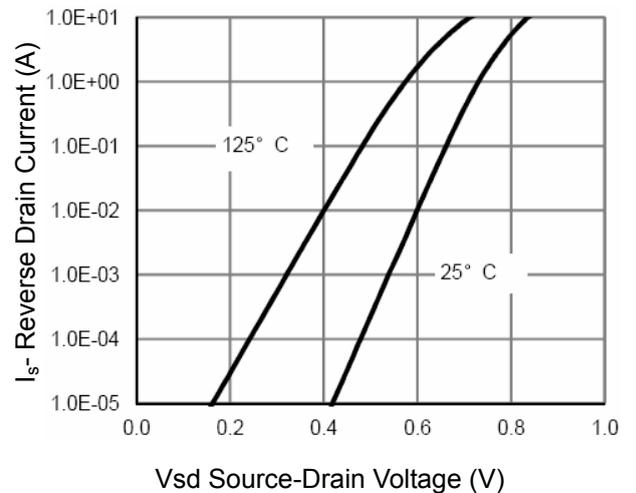


Figure 6 Source- Drain Diode Forward



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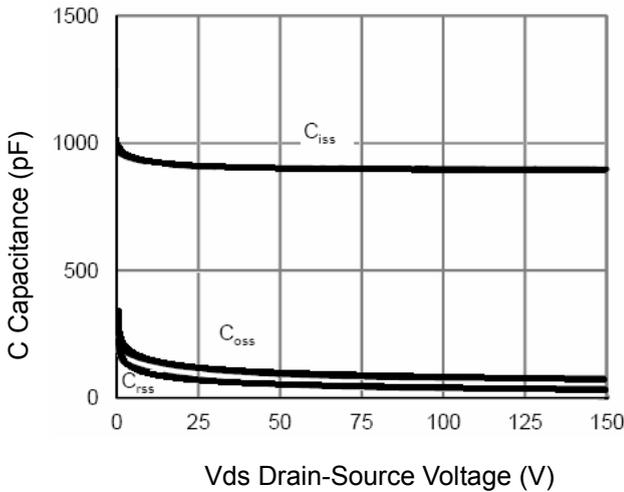


Figure 7 Capacitance vs Vds

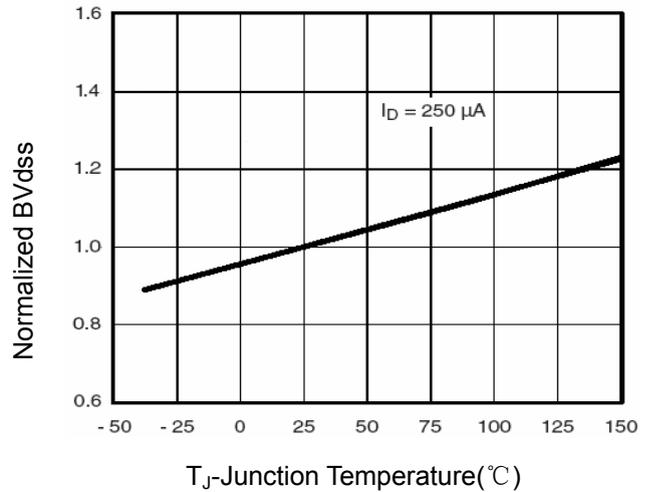


Figure 9 BV_{DSS} vs Junction Temperature

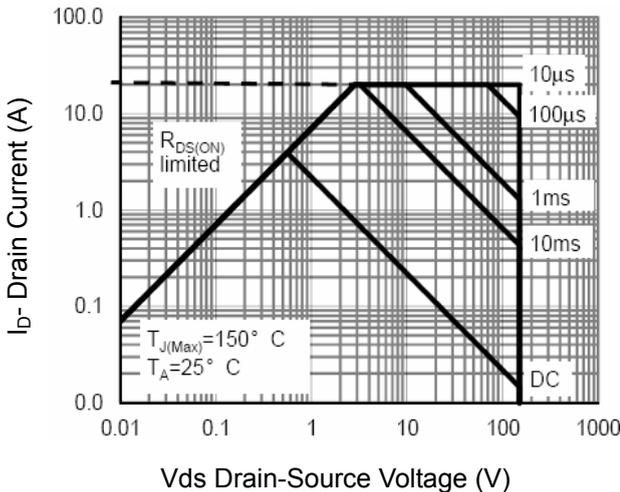


Figure 8 Safe Operation Area

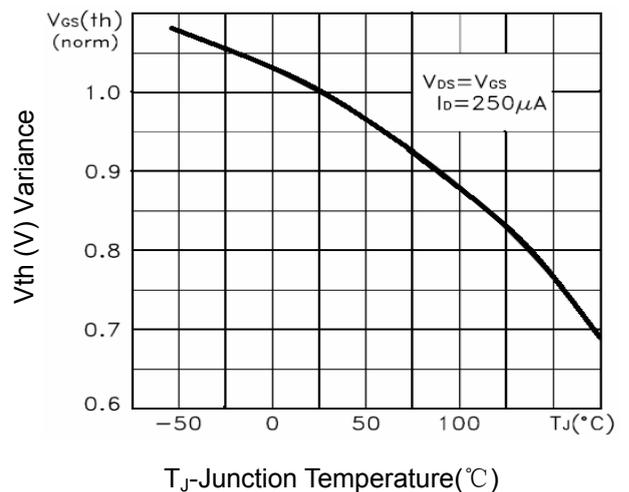


Figure 10 $V_{GS(th)}$ vs Junction Temperature

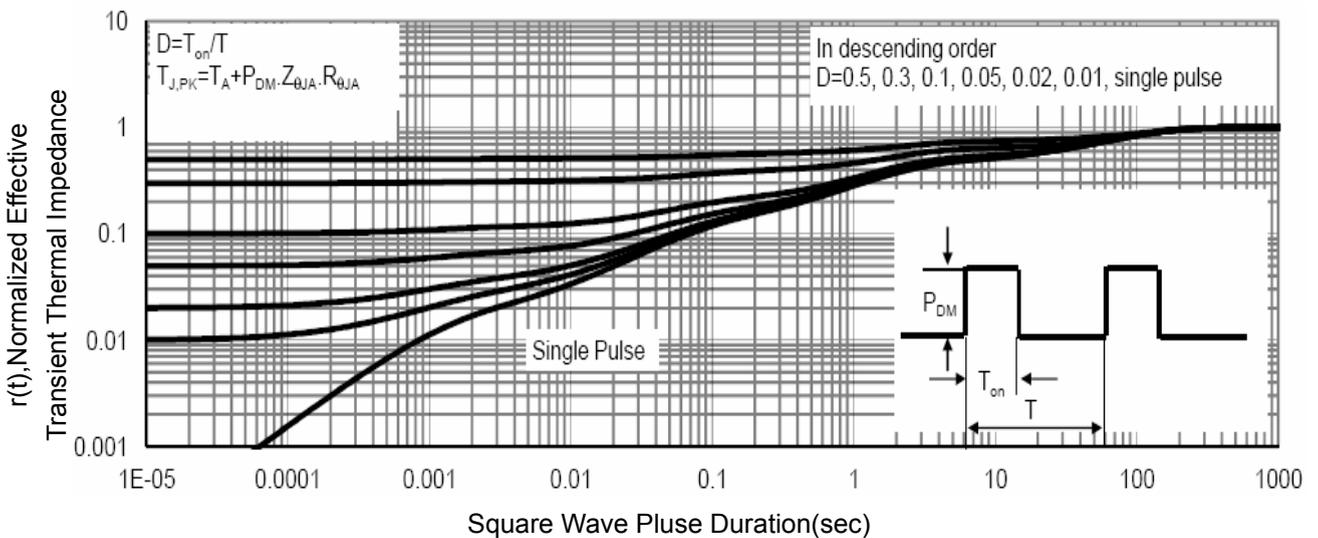
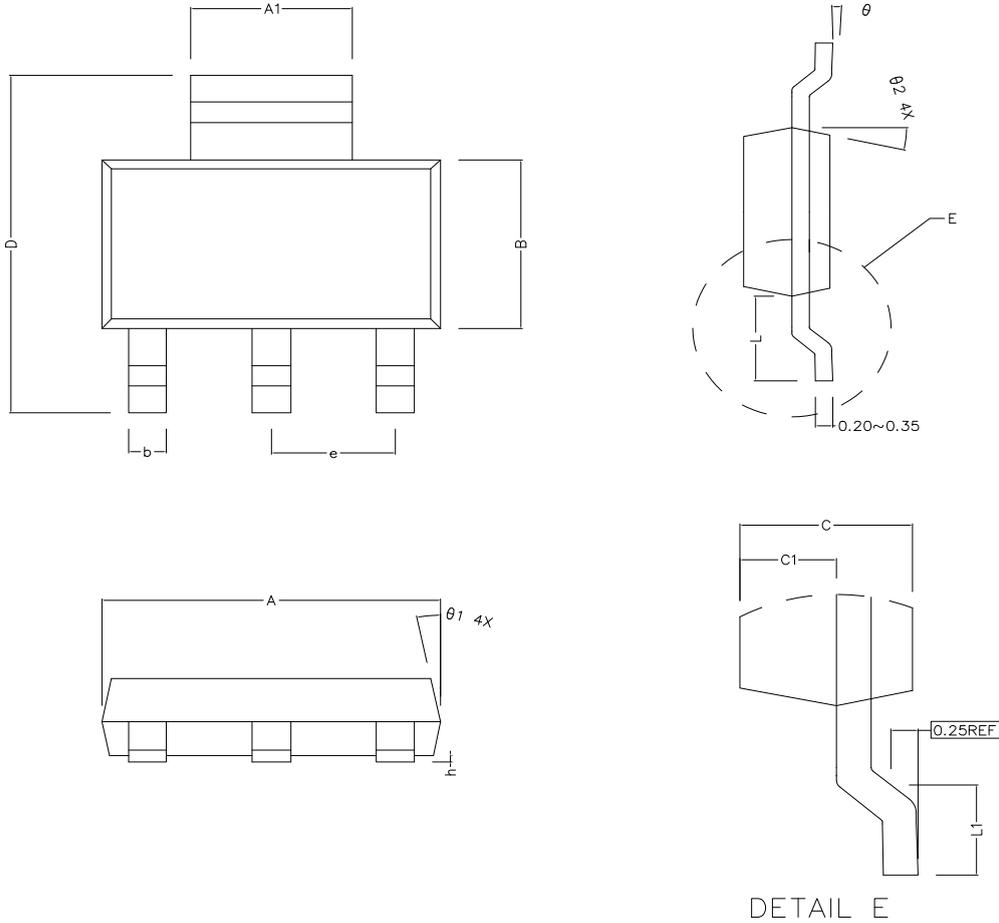


Figure 11 Normalized Maximum Transient Thermal Impedance



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SOT-223 Package Outline Dimensions (Units: mm)



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	6.400	6.500	6.600
A1	2.900	3.000	3.100
B	3.400	3.500	3.600
C	1.550	1.600	1.650
C1	0.850	0.900	0.950
D	6.800	7.000	7.200
L	1.650	1.750	1.850
L1	0.900	1.000	1.150
b	0.660	0.740	0.820
h	0.020	0.050	0.100
e	2.300TYPE		
θ ₁	13° TYPE		
θ ₂	13° TYPE		
θ	0° ~ 8°		