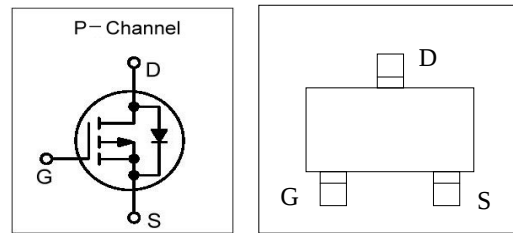


**-60V/-4A P-Channel Advanced Power MOSFET****General Features**

- $V_{DS} = -60V, I_D = -4A$
 $R_{DS(ON)} < 110m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 150m\Omega @ V_{GS} = -4.5V$
- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation



SOT-23-3L

Application

- Load switch
- PWM application

Order Information

Product	Package	Packing
PTL04P06	SOT-23-3L	3000PCS/Reel

Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-4	A
Pulsed Drain Current	I_{DM}	-12	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ\text{C}$

Thermal Characteristic

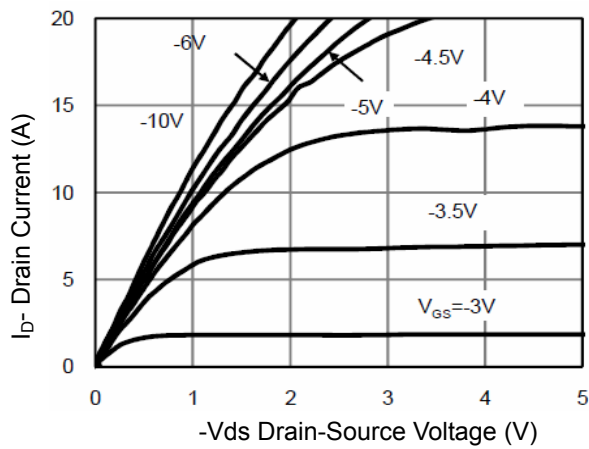
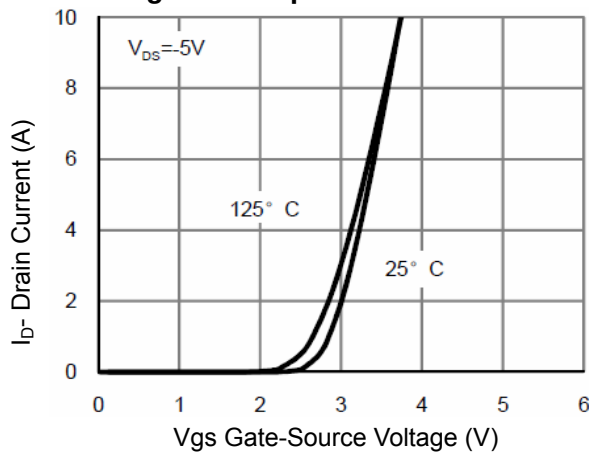
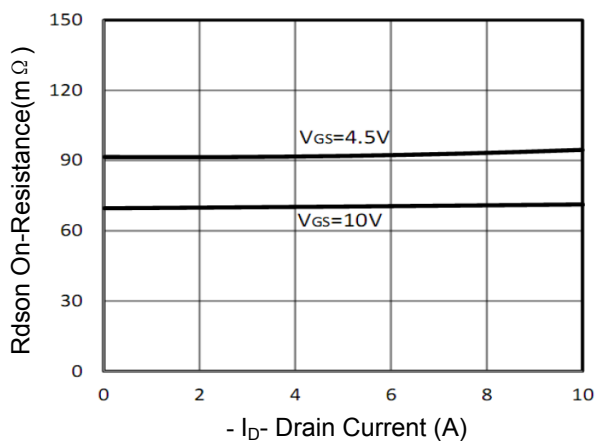
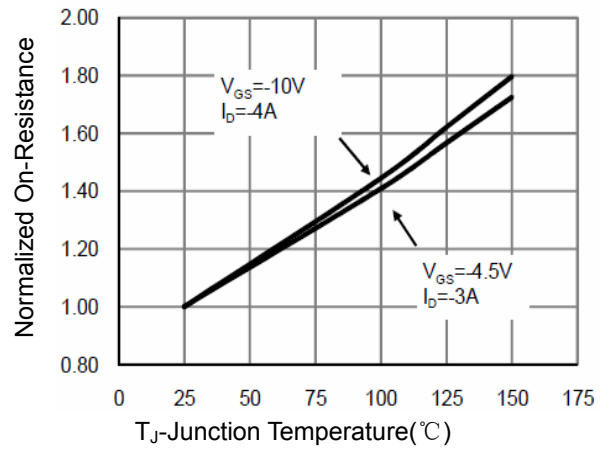
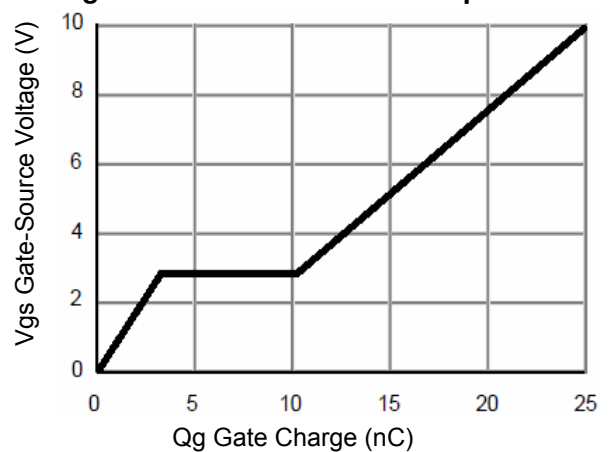
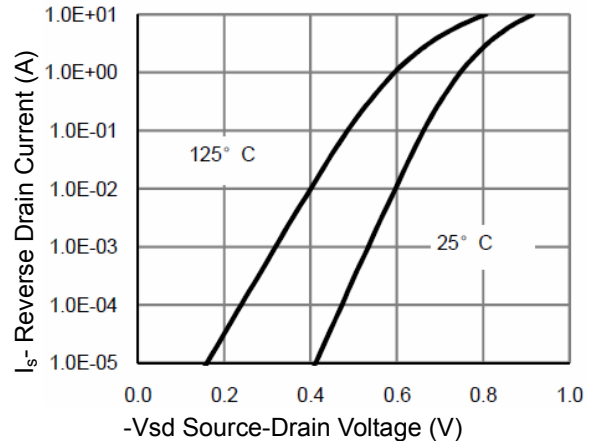
Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	83.3	$^\circ\text{C/W}$
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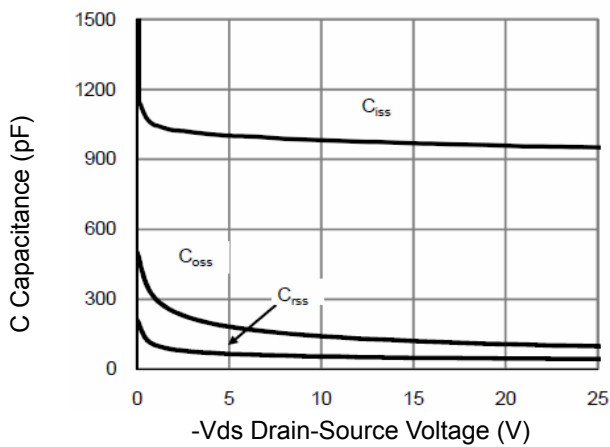
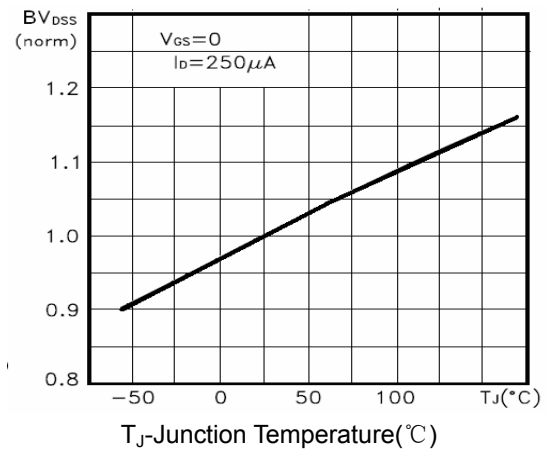
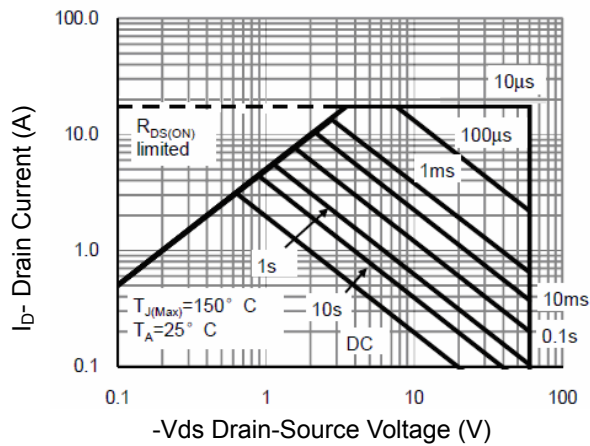
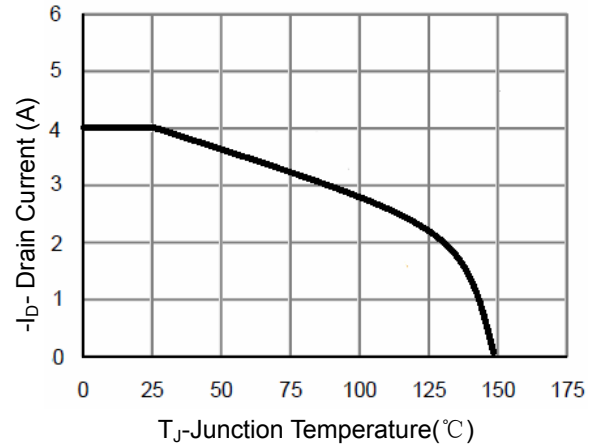
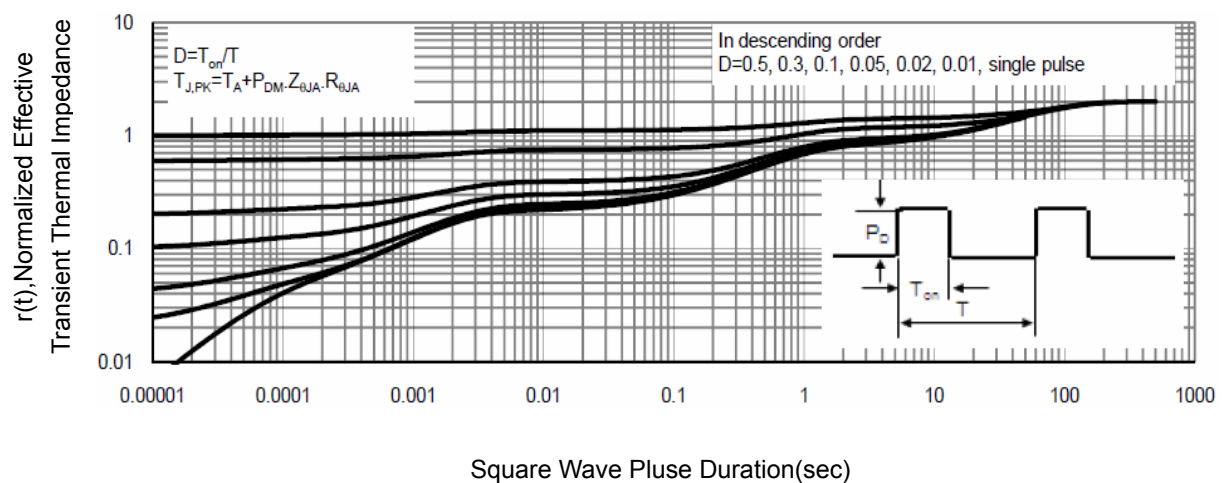
**-60V/-4A P-Channel Advanced Power MOSFET****Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)**

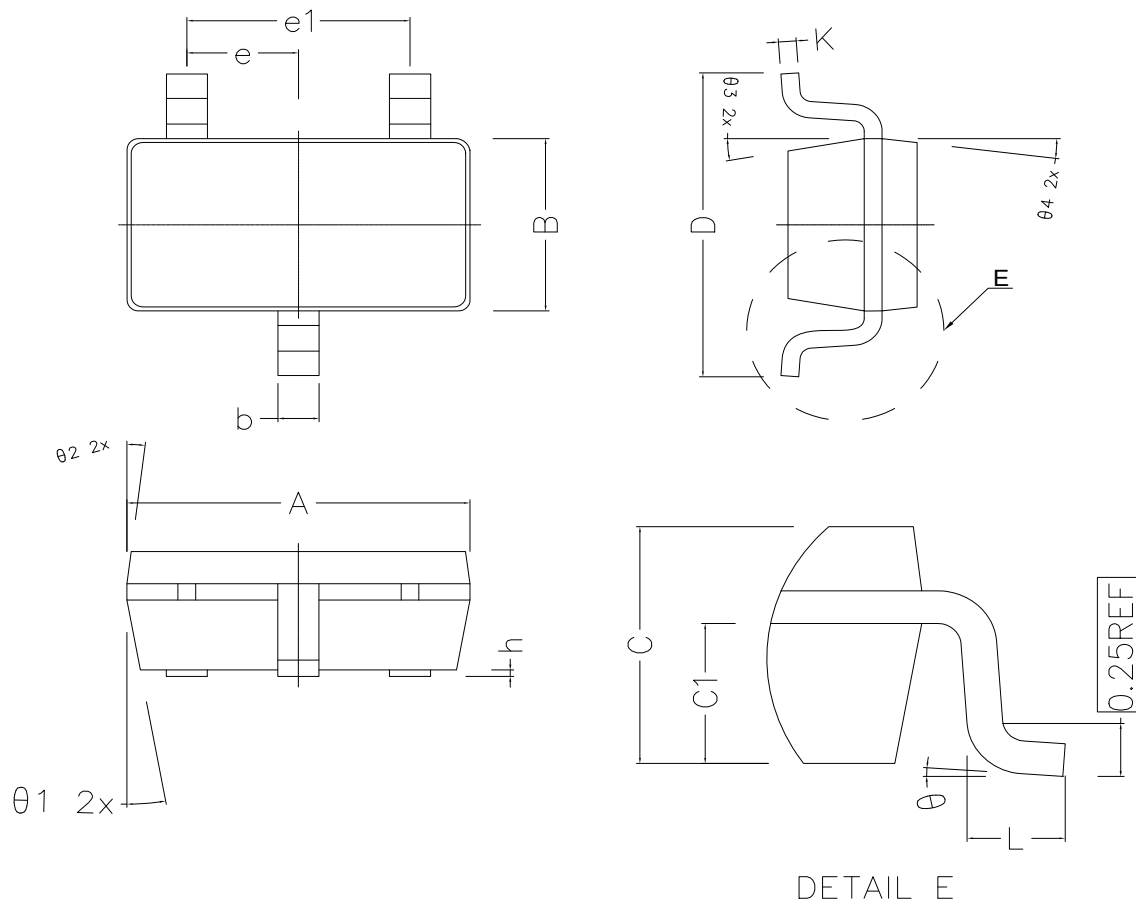
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	-60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.28	-1.6	-3.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-4A		73	110	mΩ
		V _{GS} =-4.5V, I _D =-3A		92	150	Ω
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-4A	-	10	-	S
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, F=1.0MHz	-	930	-	PF
Output Capacitance	C _{oss}		-	85	-	PF
Reverse Transfer Capacitance	C _{rss}		-	35	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-30V, R _L =7.5Ω, V _{GS} =-10V, R _G =3Ω	-	8	-	nS
Turn-on Rise Time	t _r		-	4	-	nS
Turn-Off Delay Time	t _{d(off)}		-	32	-	nS
Turn-Off Fall Time	t _f		-	7	-	nS
Total Gate Charge	Q _g	V _{DS} =-30, I _D =-4A, V _{GS} =-10V	-	25	-	nC
Gate-Source Charge	Q _{gs}		-	3	-	nC
Gate-Drain Charge	Q _{gd}		-	7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =-4A	-		-1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	-4	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F =- 4A	-	25		nS
Reverse Recovery Charge	Q _{rr}	di/dt = -100A/μs ^(Note3)	-	31		nC

Notes:

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

**-60V/-4A P-Channel Advanced Power MOSFET****Typical Electrical and Thermal Characteristics (Curves)****Figure 1 Output Characteristics****Figure 2 Transfer Characteristics****Figure 3 Rdson- Drain Current****Figure 4 Rdson-Junction Temperature****Figure 5 Gate Charge****Figure 6 Source- Drain Diode Forward**

**-60V/-4A P-Channel Advanced Power MOSFET****Figure 7 Capacitance vs Vds****Figure 9 BV_{DSS} vs Junction Temperature****Figure 8 Safe Operation Area****Figure 10 ID Current De-rating****Figure 11 Normalized Maximum Transient Thermal Impedance**

**SOT-23-3L Package Outline Dimensions (Units: mm)**

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.820	2.920	3.020
B	1.500	1.600	1.700
C	1.050	1.100	1.150
C1	0.600	0.650	0.700
D	2.650	2.800	2.950
L	0.300	0.450	0.600
b	0.280	0.350	0.420
h	0.020	0.050	0.100
K	0.120	—	0.230
e	0.950TYPE		
e1	1.900TYPE		
θ ₁	10° TYPE		
θ ₂	7° TYPE		
θ ₃	10° TYPE		
θ ₄	7° TYPE		
θ	0° ~ 8°		