PT3415

PUOLOP 迪浦

-20V P-Channel Enhancement Mode MOSFET

General Features

● V_{DS} = -20V, I_D =-4A

$R_{DS(ON)}$ < 63mΩ @ V_{GS}=-2.5V

$R_{DS(ON)}$ < 55mΩ @ V_{GS}=-4.5V

ESD Rating: 2500V HBM

● High Power and current handing capability

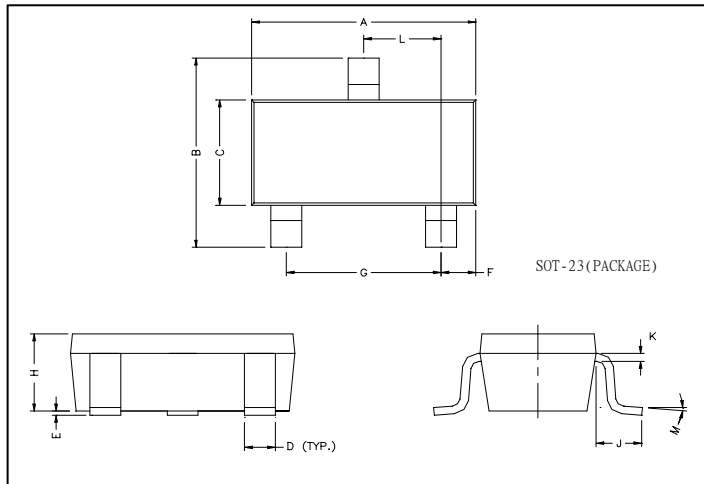● Lead free product is acquired

● Surface mount package
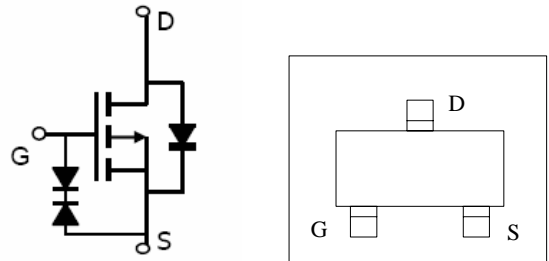
Application

● PWM application

● Load switch

Description

The PT3415 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as1.8V. This device is suitable for use as a load switch or in PWM applications .It is ESD protested.

Schematic diagram

Package Dimensions

SOT-23(PACKAGE)

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	1.90	REF.
B	2.40	2.80	H	1.00	1.30
C	1.40	1.60	K	0.10	0.20
D	0.35	0.50	J	0.40	-
E	0	0.10	L	0.85	1.15
F	0.45	0.55	M	0°	10°

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±8	V
Drain Current-Continuous	I_D	-4	A
Drain Current-Pulsed (Note 1)	I_{DM}	-30	A
Maximum Power Dissipation	P_D	1.4	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{θJA}$	89.3	℃/W

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-20		-	V

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Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±8V,V_{DS}=0V	-	-	±10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.4	-0.65	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4A	-	34.	55	mΩ
		V_{GS}=-2.5V, I_D=-4A	-	44	63	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-4A	8	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{Iss}	V_{DS}=-10V,V_{GS}=0V, F=1.0MHz	-	950	-	PF
Output Capacitance	C_{oss}		-	165	-	PF
Reverse Transfer Capacitance	C_{rss}		-	120	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V,R_L=2.5Ω V_{GS}=-4.5V,R_{GEN}=3Ω	-	12		nS
Turn-on Rise Time	t_r		-	10		nS
Turn-Off Delay Time	$t_{d(off)}$		-	19		nS
Turn-Off Fall Time	t_f		-	25		nS
Total Gate Charge	Q_g	V_{DS}=-10V,I_D=-4A, V_{GS}=-4.5V	-	12		nC
Gate-Source Charge	Q_{gs}		-	1.4	-	nC
Gate-Drain Charge	Q_{gd}		-	3.6	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1A	-	-	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-2.2	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production
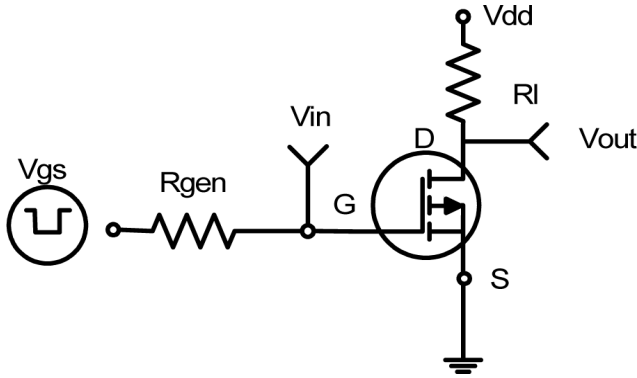
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
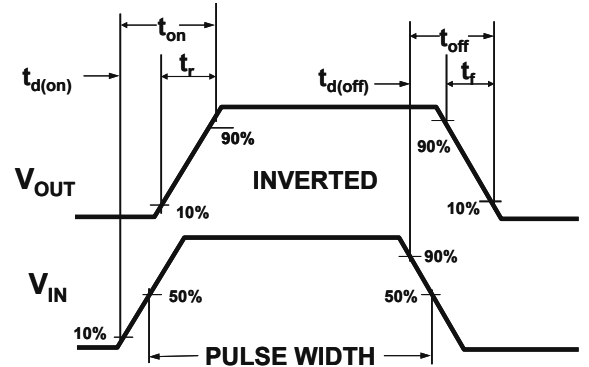
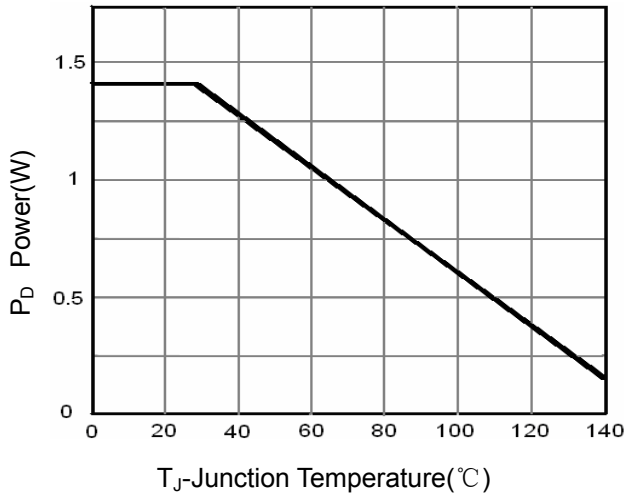**Figure 1:Switching Test Circuit**

Figure 2:Switching Waveforms

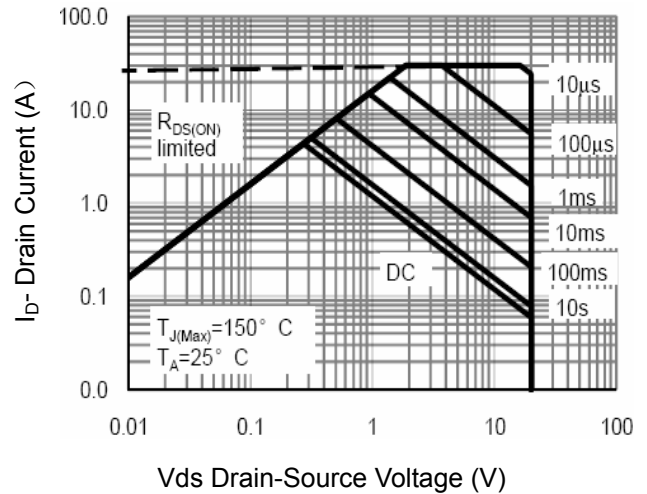**Figure 3 Power Dissipation**

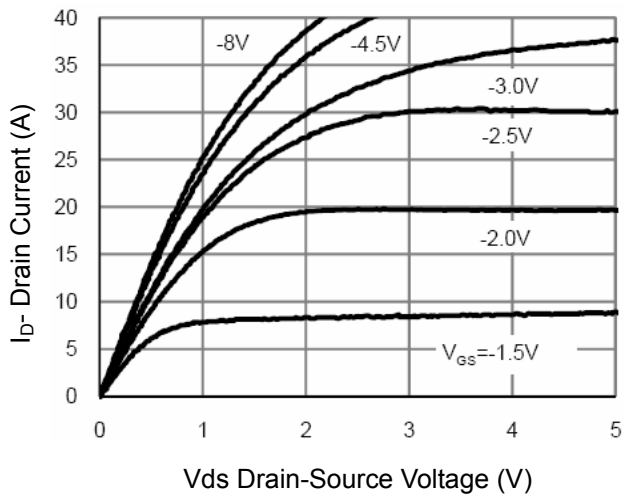**Figure 4   Safe Operation Area**
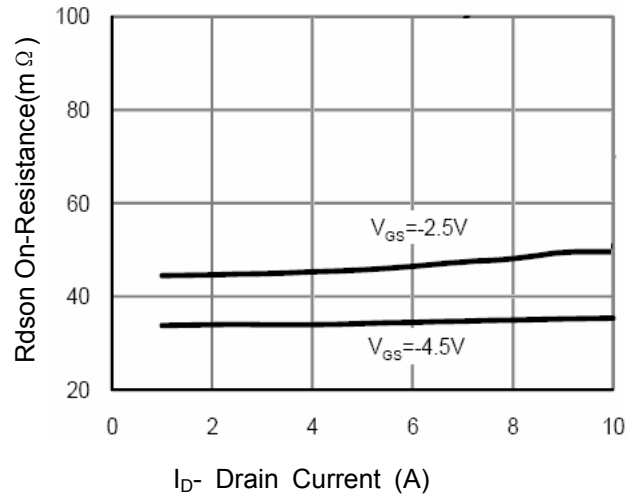
Figure 5 Output CHARACTERISTICS

Figure 6 Drain-Source On-Resistance

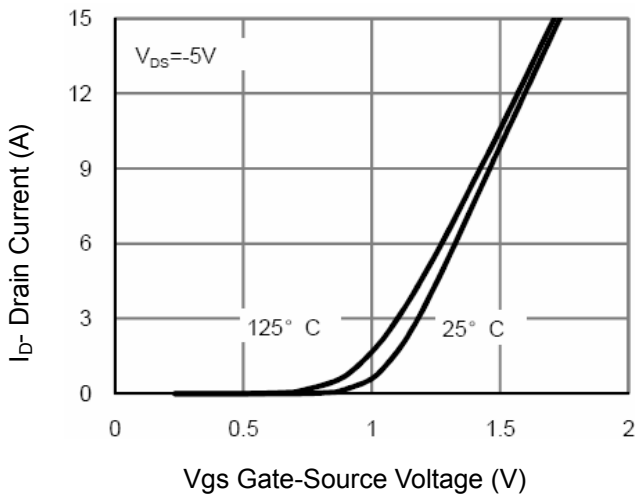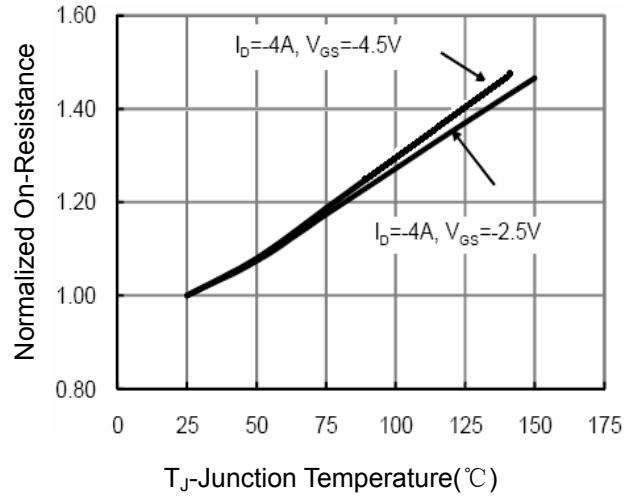-20V P-Channel Enhancement Mode MOSFET

Figure 7 Transfer Characteristics
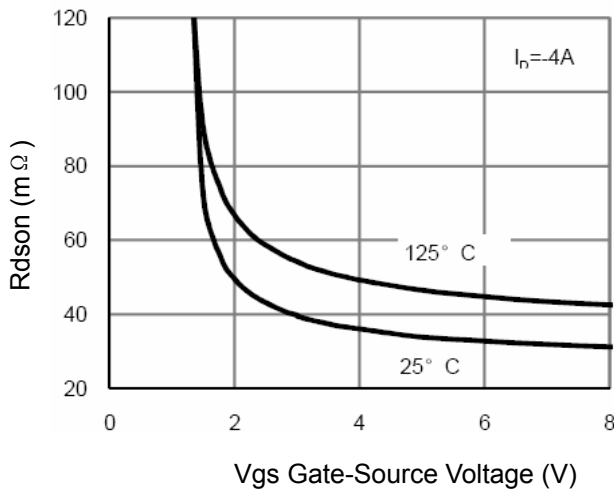

Figure 8 Drain-Source On-Resistance
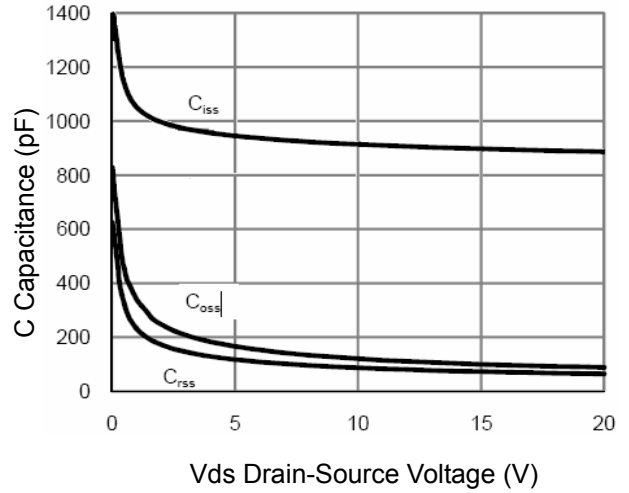

Figure 9 Rdson vs Vgs
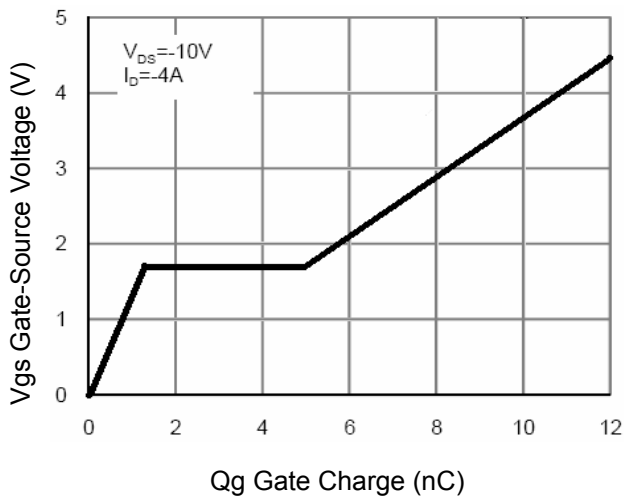

Figure 10 Capacitance vs Vds
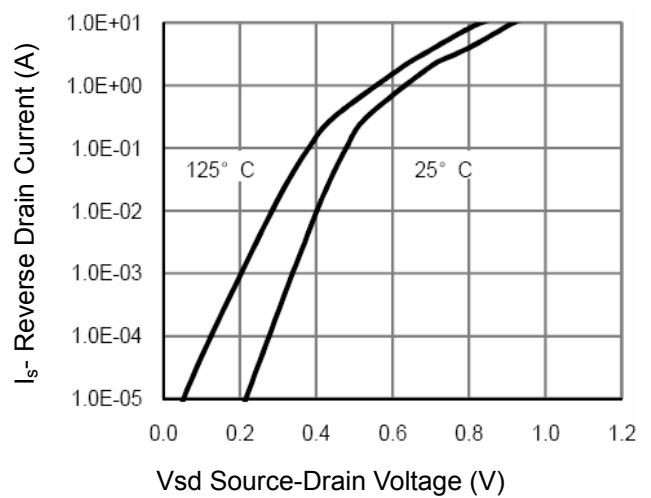

Figure 11 Gate Charge

Figure 12 Source- Drain Diode Forward

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