PT4435

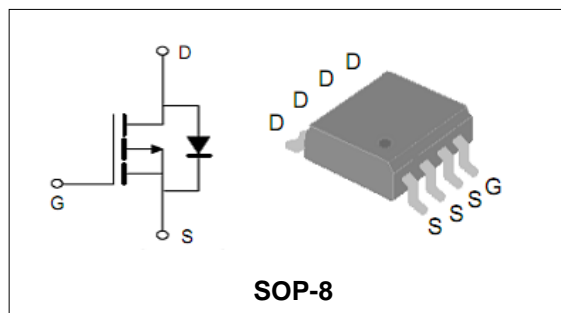## -30V/-10.5A P-Channel Advanced Power MOSFET

Features

- Advanced trench p rocess technology
- High Density Cell D esign For Ultra Low On-Resistance

BVDSS	-30	V
ID	-10.5	A
RDSON@VGS=-4.5V	16	mΩ
RDSON@VGS=-10V	11	mΩ

Applications

- PWM applications
- Load switch
- Power management

SOP-8

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PT4435	SOP-8	PT4435	13inch	3000PCS	48000PCS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		-30	V
V_{GS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	TA =25°C	-10.5	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note1)	TA =25°C	-50	A
I_D	Continuous Drain current	TA =25°C	-10.5	A
P_D	Maximum Power Dissipation	TA =25°C	2.5	W
$R_{\theta JA}$	Thermal Resistance Junction−to−Ambient (Note2)		50	°C/W

-30V/-10.5A P-Channel Advanced Power MOSFET

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain- Source Breakdown Voltage	VGS=0V ID=-250µA	-30	--	--	V
I_{DSS}	Zero Gate Voltage Drain current	VDS=-24V,VGS=0V	--	--	-1	µA
I_{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS,ID=-250µA	-1	-1.4	-3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note3)	VGS=-10V, ID=-10.5A	--	11	20	mΩ
		VGS=-4.5V, ID=-6A	--	16	30	mΩ
g_{FS}	Forward Transconductance	VDS=-10V,ID=-5A	--	21	--	S
Dynamic Electrical Characteristics @ T$_J$ = 25°C (unless otherwise stated) (Note4)						
C_{iss}	Input Capacitance	VDS= -8V,	--	1740	--	pF
C_{oss}	Output Capacitance	VGS=0V,	--	235	--	pF
C_{rss}	Reverse Transfer Capacitance	F=1MHz	--	225	--	pF
Q_g	Total Gate Charge	VDS= -15V,	--	37.2	--	nC
Q_{gs}	Gate-Source Charge	ID= -9.1A,	--	9.84	--	nC
Q_{gd}	Gate-Drain Charge	VGS= -10V	--	7.52	--	nC
Switching Characteristics (Note4)						
$t_{d(on)}$	Turn-on Delay Time	VDD = -15V,	--	10	--	nS
t_r	Turn-on Rise Time	RL=15Ω ID = -1A,	--	15	--	nS
$t_{d(off)}$	Turn-off Delay Time	VGEN = -10V RG = 6Ω	--	110	--	nS
t_f	Turn-off Fall Time		--	70	--	nS
Source- Drain Diode Characteristics @ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage (Note3)	IS=-2.1A,VGS=0V	--	--	-1.2	V

Note:

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

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

3.   Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.

4.   Guaranteed by design, not subject to production testing.

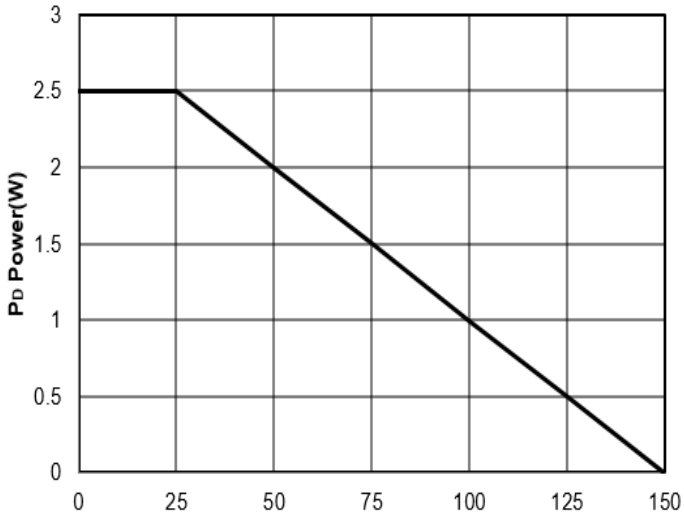**-30V/-10.5A P-Channel Advanced Power MOSFET**

Typical Characteristics
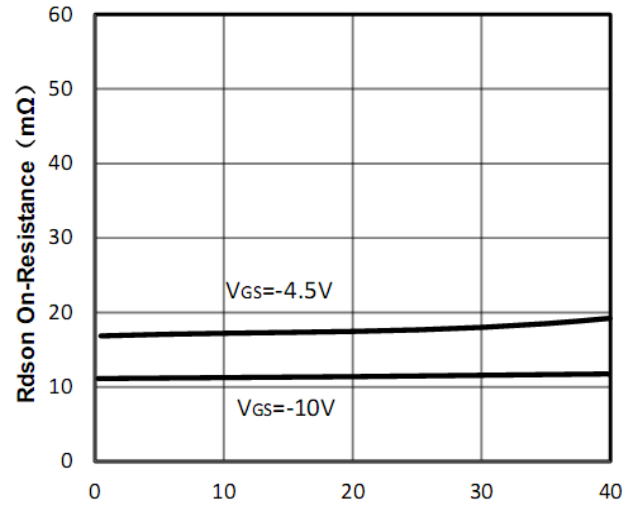

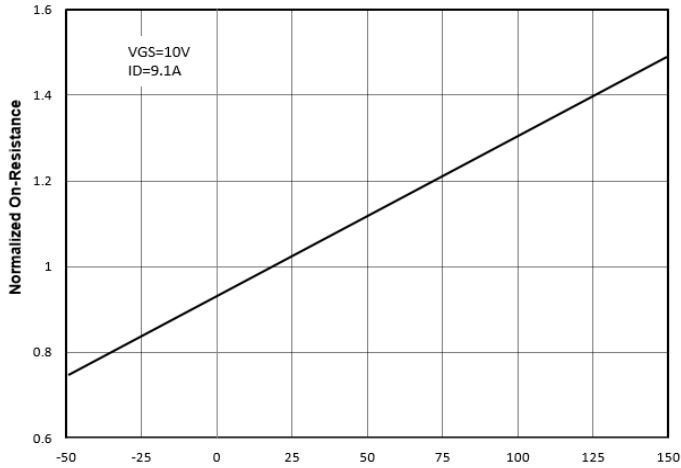**Figure1：T$_J$ Junction Temperature（°C）**

Figure2：I$_D$ Drain Current（A）

Figure3：T$_J$ Junction Temperature（°C）

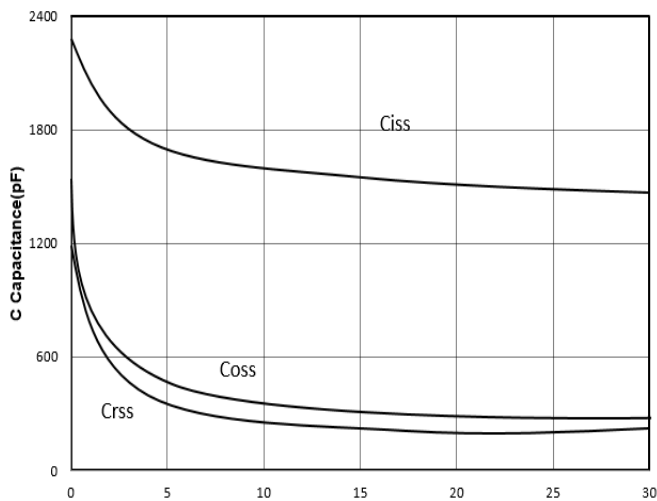**Figure4：V$_{DS}$ Drain-Source Voltage（V）**
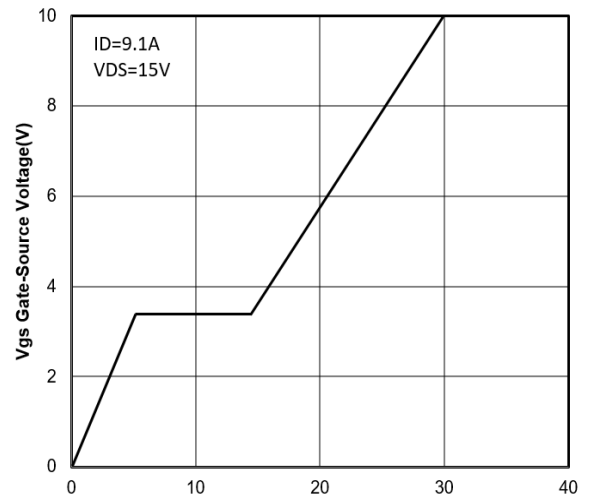

Figure5：V$_{DS}$ Drain-Source Voltage（V）

Figure6：Qg Gate Charge（nC）

-30V/-10.5A P-Channel Advanced Power MOSFET
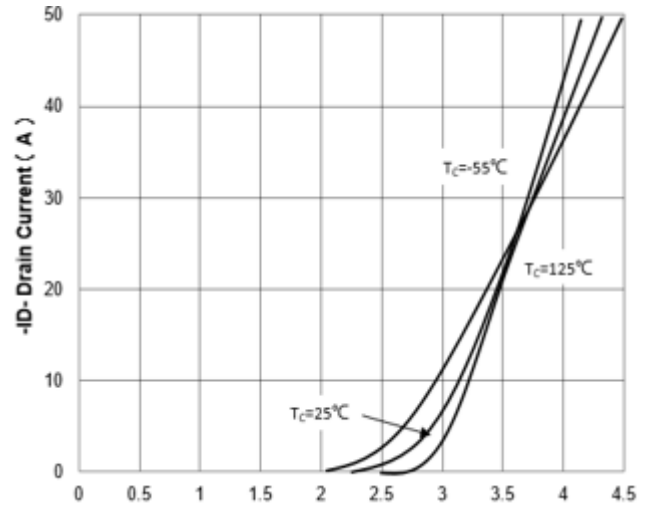

Figure7：Vds Source-Drain Voltage（V）

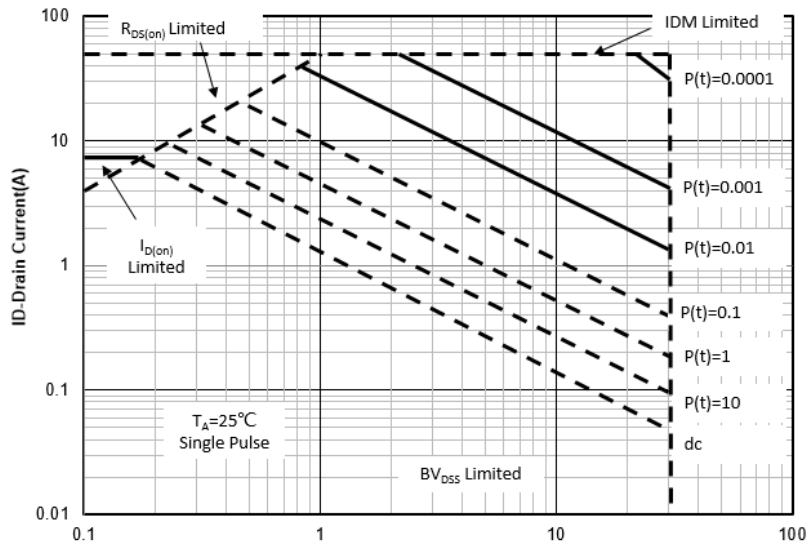Figure8：-Vgs Gate-Source Voltage（V）

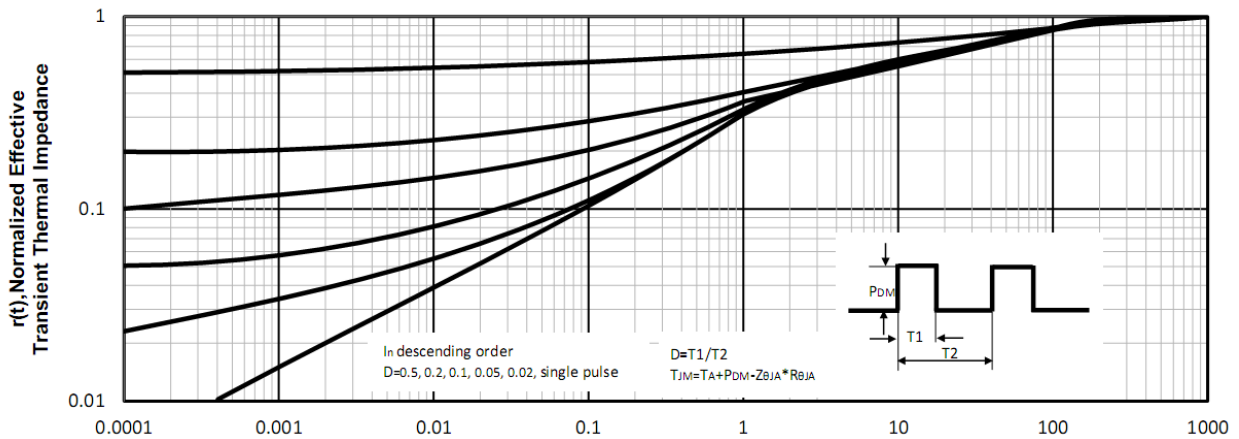Figure9：Vds Drain -Source　Voltage（V）

Figure10：Square Wave Pulse Duration（sec）

-30V/-10.5A P-Channel Advanced Power MOSFET

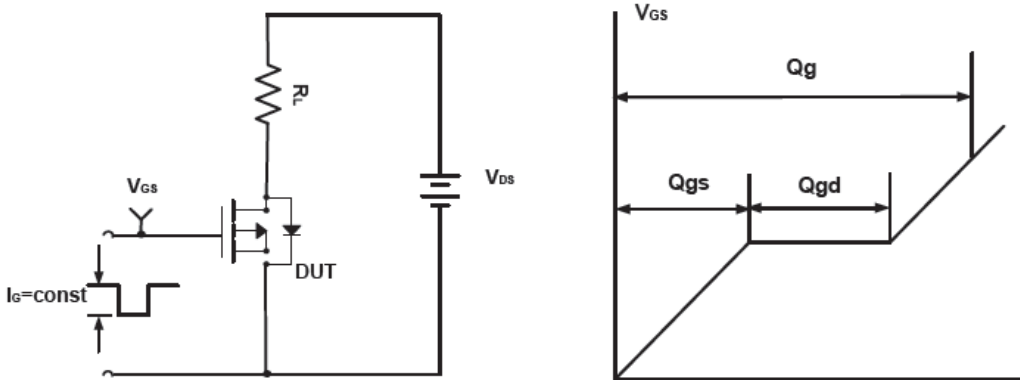## Test Circuit and Waveform:

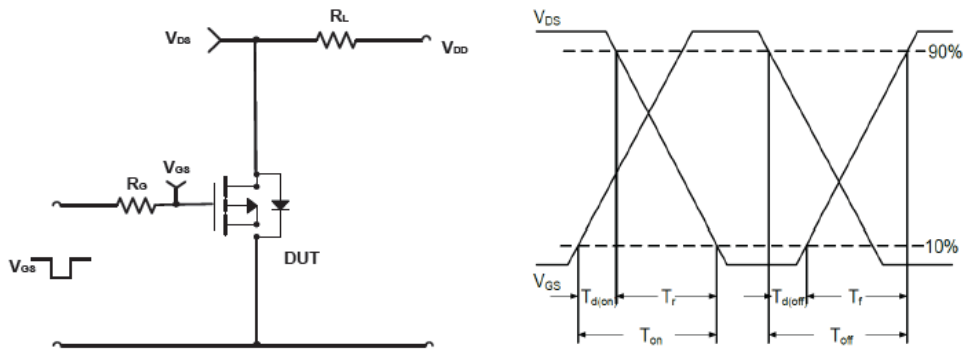
Figure A   Gate Charge Test Circuit &Waveforms

Figure B   Switching Test Circuit & Waveforms

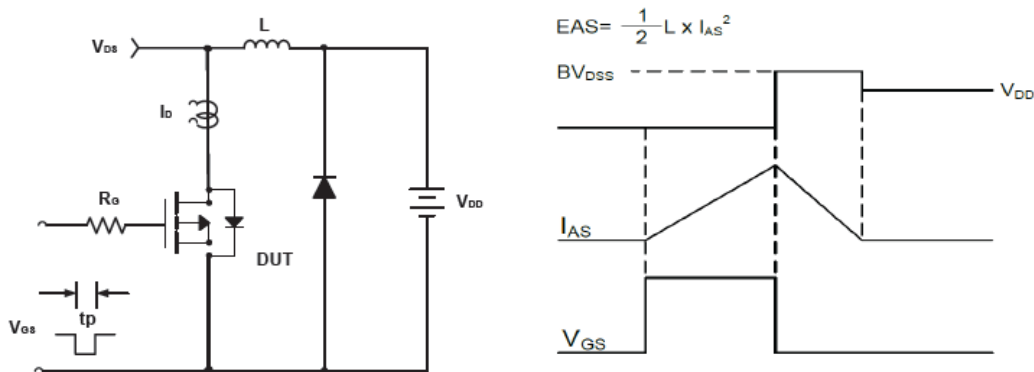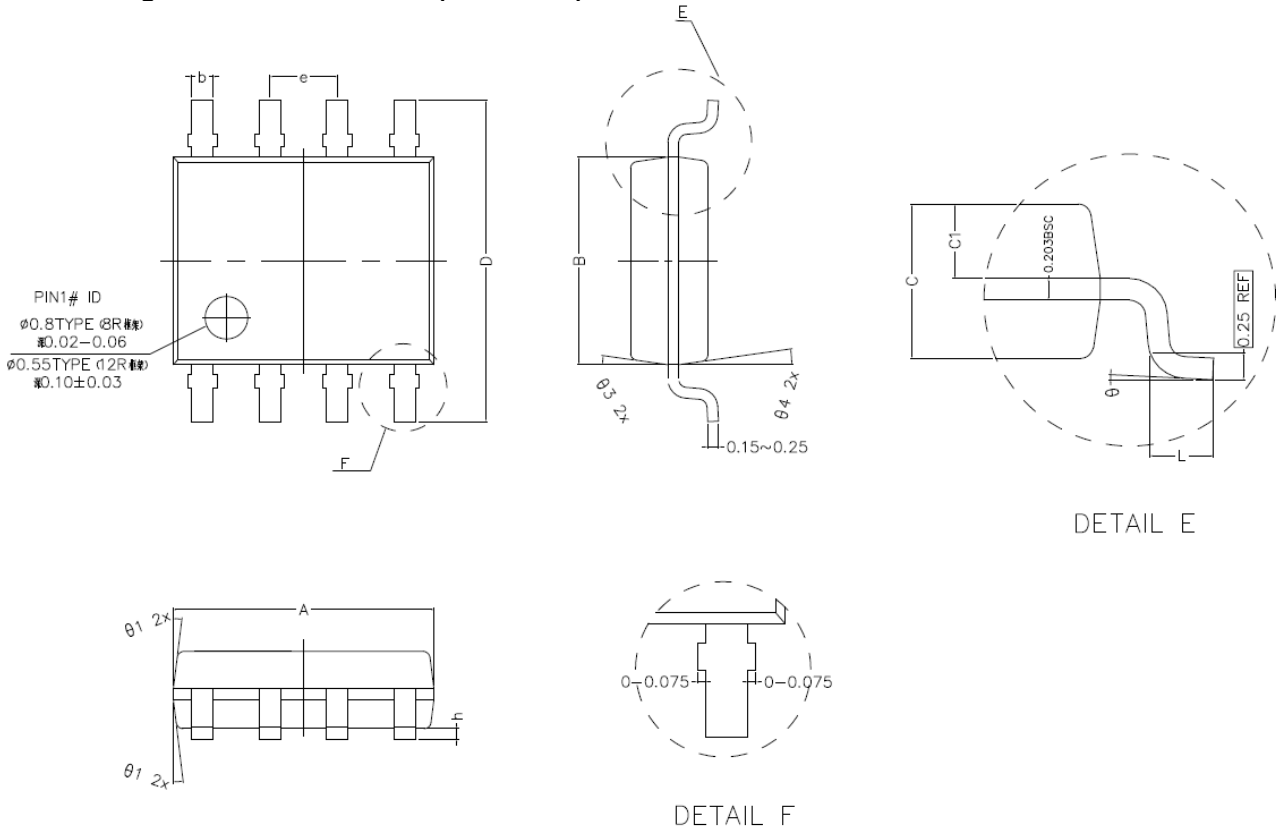$$EAS = \frac{1}{2} L \times I_{AS}^2$$

Figure C   Unclamped Inductive Switching Circuit & Waveforms

-30V/-10.5A P-Channel Advanced Power MOSFET

SOP-8 Package Outline Dimensions (Units: mm)

DETAIL E

DETAIL F

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	4.800	4.900	5.000
B	3.800	3.900	4.000
C	1.350	1.450	1.550
C1	0.650	0.700	0.750
D	5.900	6.100	6.300
L	0.500	0.600	0.700
b	0.350	0.400	0.450
h	0.050	0.150	0.250
e	1.270TYPE		
θ_1	7° TYPE(8R)	12° TYPE(12R)	
θ_2	7° TYPE(8R)	10° TYPE(12R)	
θ_3	8° TYPE(8R)	12° TYPE(12R)	
θ_4	8° TYPE(8R)	10° TYPE(12R)	
θ	0° ~ 8°		

6