

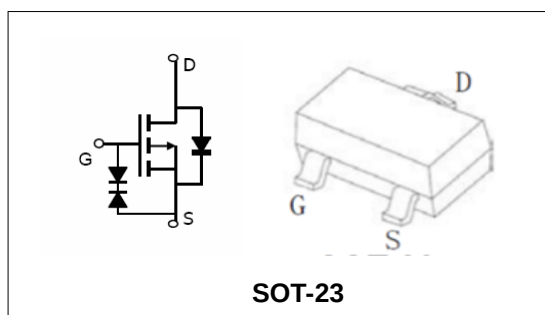
**-20V/-4A P-Channel Enhancement Mode MOSFET****Features**

- High Power and current handing capability
- Lead free product is acquired
- Surface mount package

Applications

- PWM application
- Load switch

BVDSS	-20	V
ID	-4	A
RDSON@VGS=-4.5V	33	mΩ
RDSON@VGS=-2.5V	40	mΩ

**Order Information**

Product	Package	Marking	Reel Size	Reel	Carton
PT3415	SOT-23	AF9T	7inch	3000PCS	180000PCS

Absolute Maximum Ratings

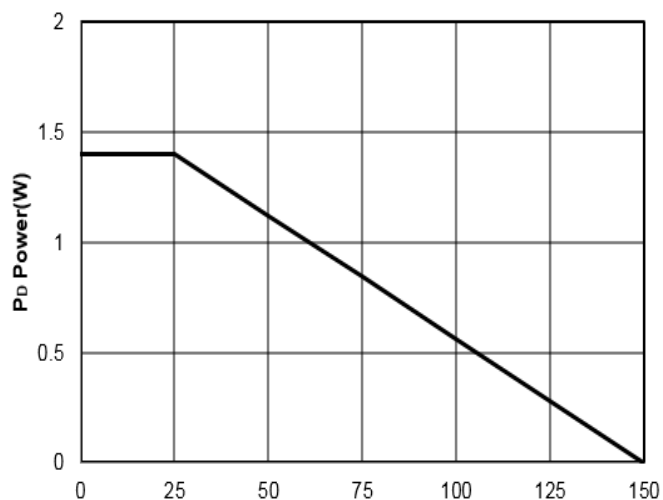
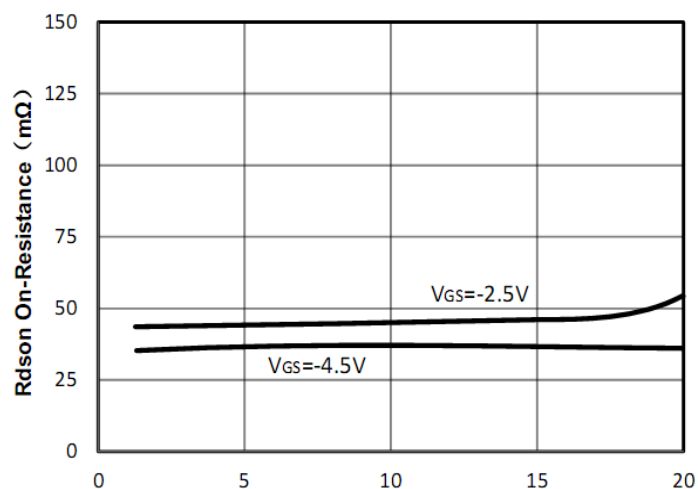
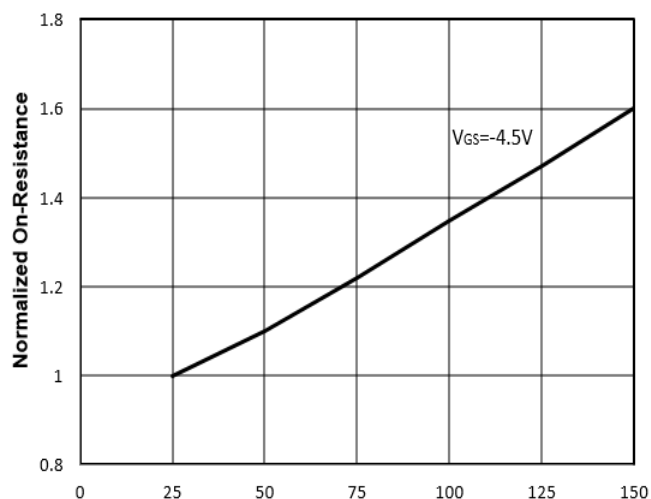
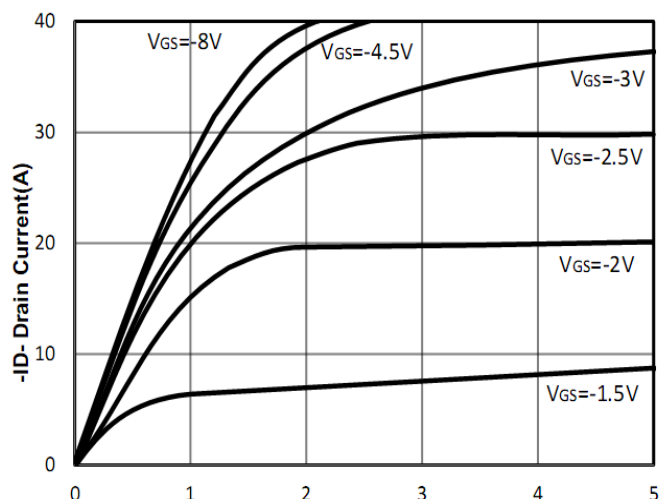
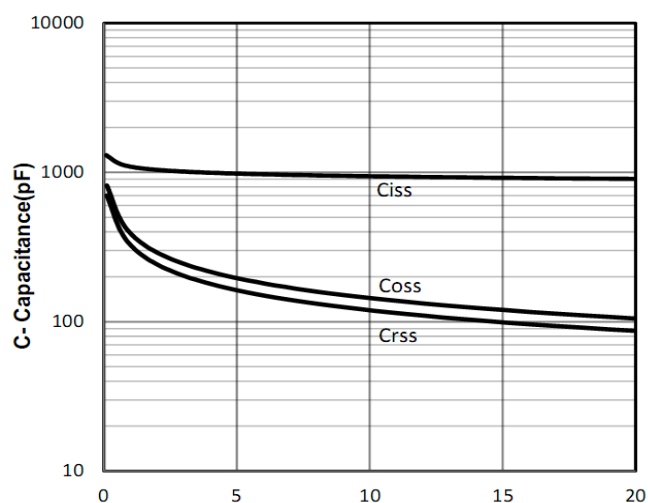
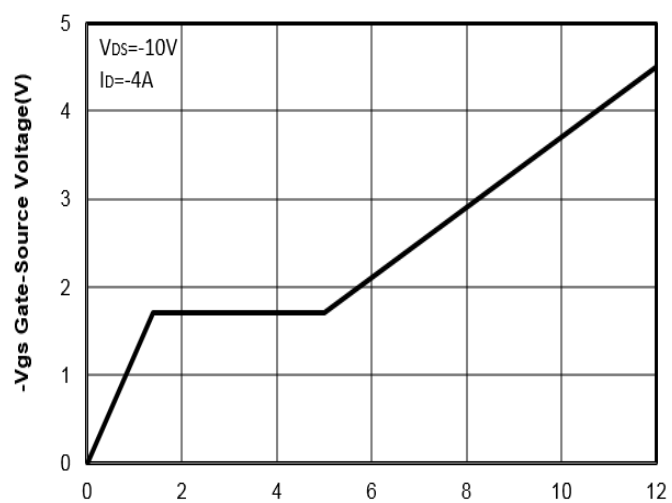
Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V _{(BR)DSS}	Drain-Source Breakdown Voltage		-20	V
V _{GS}	Gate-Source Voltage		±8	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	TA =25°C	-4	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested (Silicon Limit)	(Note1) TA =25°C	-30	A
I _D	Continuous Drain current	TA =25°C	-4	A
P _D	Maximum Power Dissipation	TA =25°C	1.4	W
R _{θJA}	Thermal Resistance Junction-to-Ambient		(Note2) 89.3	°C/W

**-20V/-4A P-Channel Enhancement Mode 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	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=-20V,VGS=0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±8V,VDS=0V	--	--	±10	uA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.4	--	-1	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note3)	VGS=-4.5V, ID=-4A	--	33	40	mΩ
		VGS=-2.5V, ID=-4A	--	40	52	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) (Note4)						
C _{iss}	Input Capacitance	VDS= -10V, VGS=0V, F=1MHz	--	950	--	pF
C _{oss}	Output Capacitance		--	165	--	pF
C _{rss}	Reverse Transfer Capacitance		--	120	--	pF
Q _g	Total Gate Charge	VDS= -10V, ID= -4A, VGS= -4.5V	--	12	--	nC
Q _{gs}	Gate-Source Charge		--	1.4	--	nC
Q _{gd}	Gate-Drain Charge		--	3.6	--	nC
Switching Characteristics (Note4)						
t _{d(on)}	Turn-on Delay Time	VDD=-10V, RL=2.5Ω, RG=3Ω, VGS=-4.5V	--	12	--	nS
t _r	Turn-on Rise Time		--	10	--	nS
t _{d(off)}	Turn-off Delay Time		--	19	--	nS
t _f	Turn-off Fall Time		--	25	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage (Note3)	IS=-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.

**-20V/-4A P-Channel Enhancement Mode MOSFET****Typical Characteristics**Figure1: T_J Junction Temperature (°C)Figure2: -I_D Drain Current (A)Figure3: T_J Junction Temperature (°C)Figure4: -V_{DS} DrainSource Voltage (V)Figure5: -V_{DS} Drain Source Voltage (V)Figure6: Q_g Gate Charge (nC)

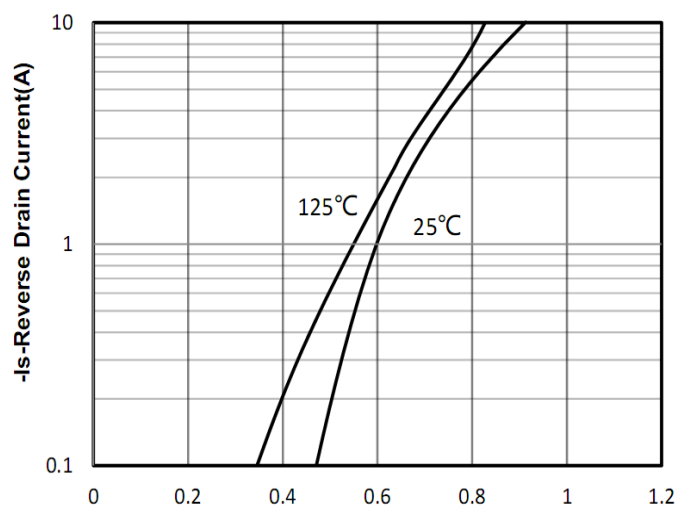
**-20V/-4A P-Channel Enhancement Mode MOSFET**

Figure7: -Vsd Source Drain Voltage (V)

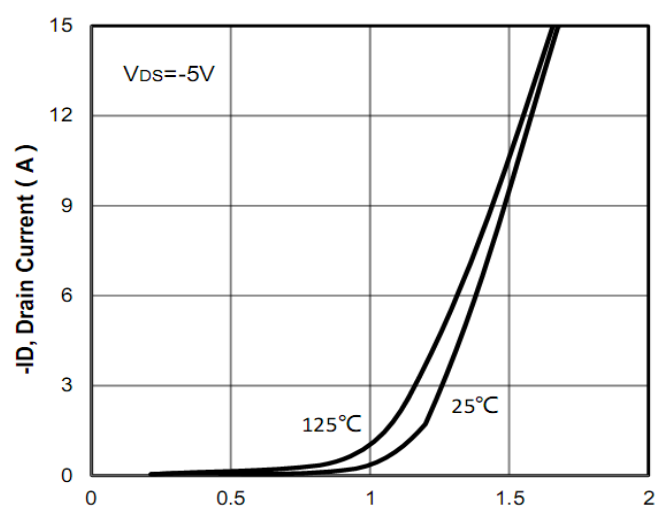


Figure8: -Vgs Gate Source Voltage (V)

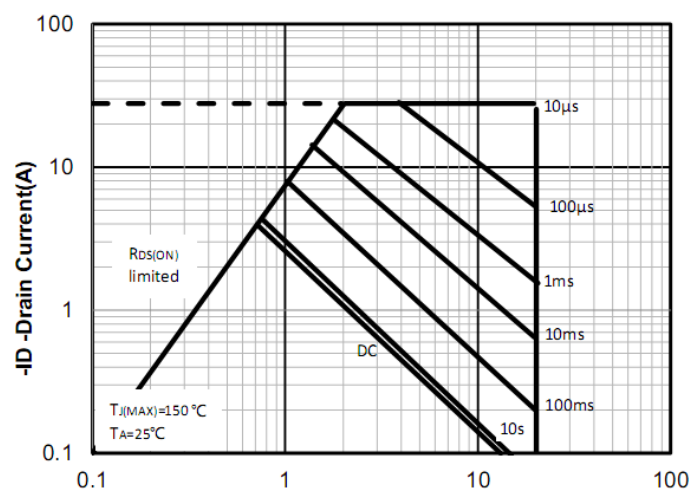


Figure9: -Vds Drain Source Voltage (V)

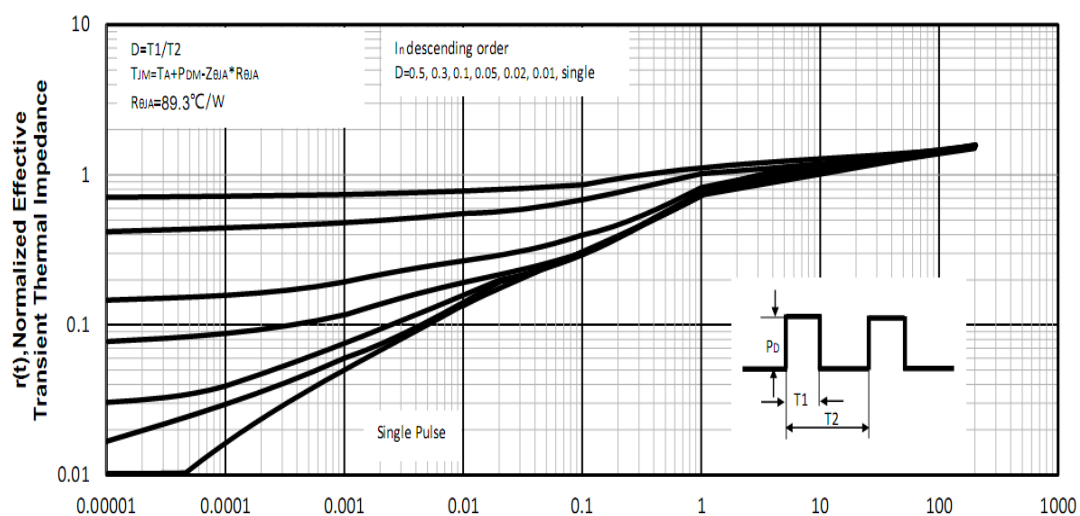
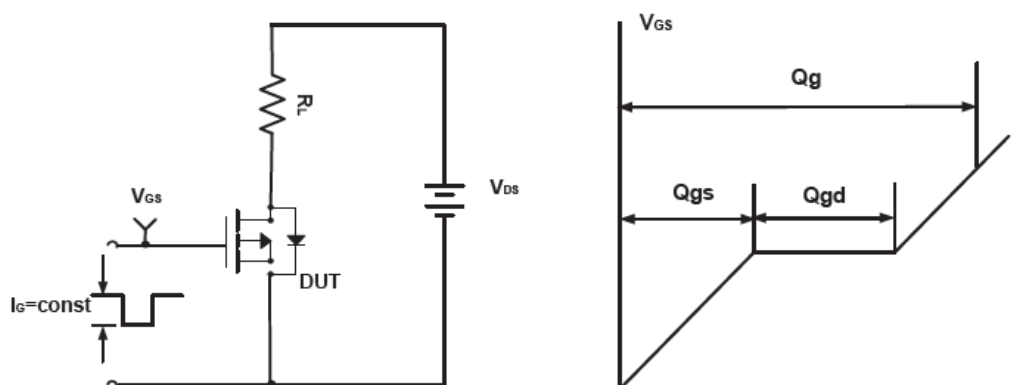
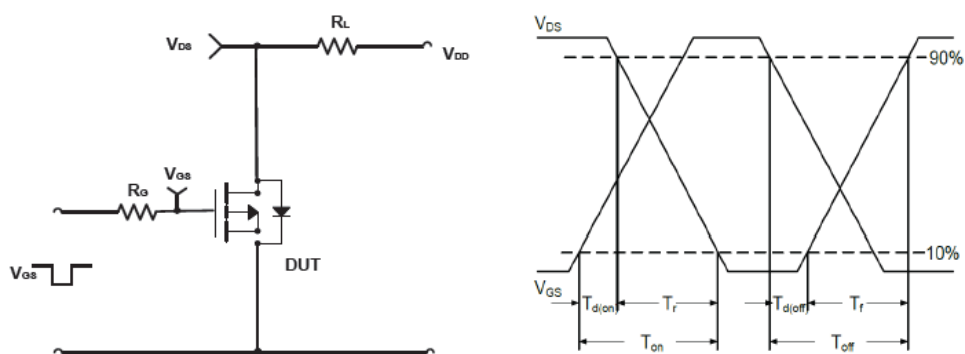
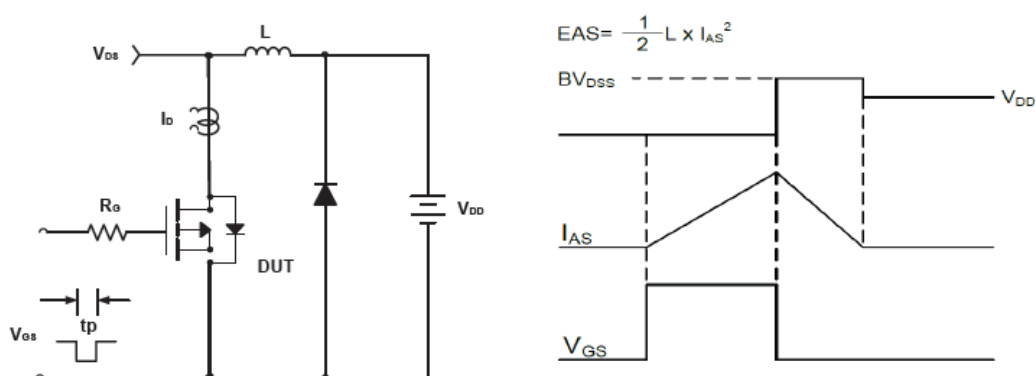
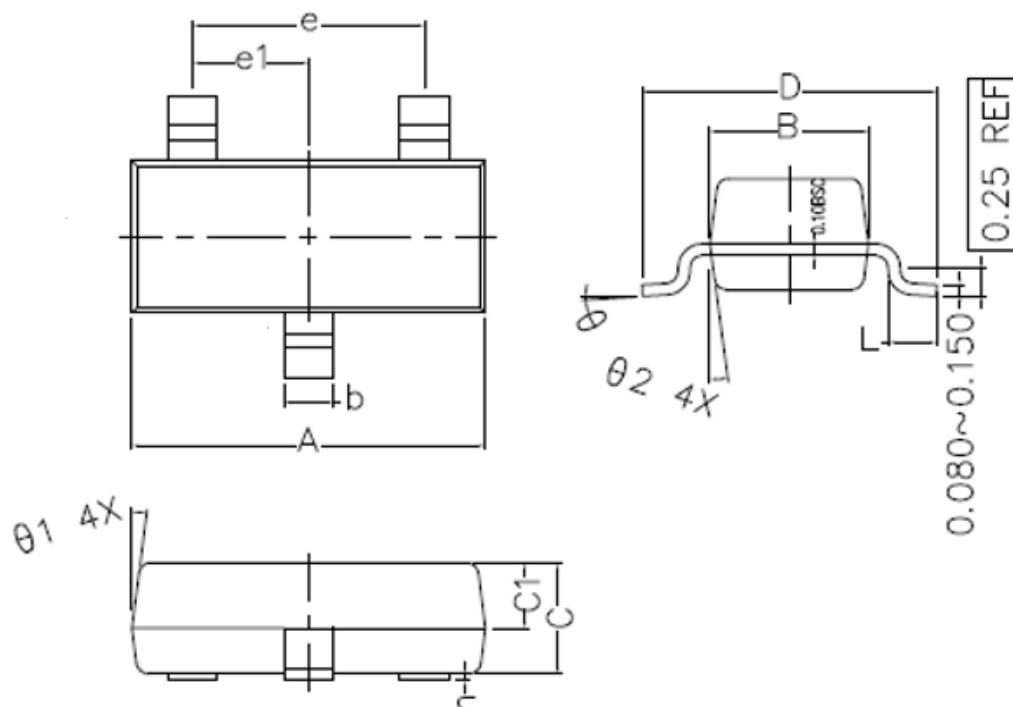


Figure10: Square Wave Pulse Duration (sec)

-20V/-4A P-Channel Enhancement Mode MOSFET
Test Circuit and Waveform:

Figure A Gate Charge Test Circuit & Waveforms

Figure B Switching Test Circuit & Waveforms

Figure C Unclamped Inductive Switching Circuit & Waveforms

**-20V/-4A P-Channel Enhancement Mode MOSFET****SOT-23 Package Outline Dimensions (Units: mm)**

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.800	2.900	3.000
B	1.200	1.300	1.400
C	0.900	1.000	1.100
C1	0.500	0.550	0.600
D	2.250	2.400	2.550
L	0.300	0.400	0.500
h	0.010	0.050	0.100
b	0.300	0.400	0.500
e	1.90 TYPE		
e1	0.95 TYPE		
θ ₁	7° TYPE		
θ ₂	7° TYPE		
θ	0° ~ 7°		