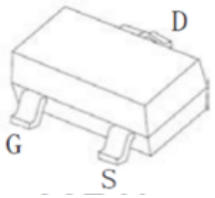
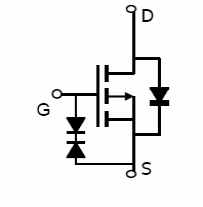
-20V/-4A P-Channel Enhancement Mode MOSFET

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

SOT-23





Features

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

Applications

- PWM application
- Load switch

Order Information

Product	Package	Marking	Reel Size	Reel
M3415E	SOT-23	AF9T	7inch	3000PCS

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		±10	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 (Sillicon 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
$R_{\theta JA}$	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=±10V,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 @ T_J = 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

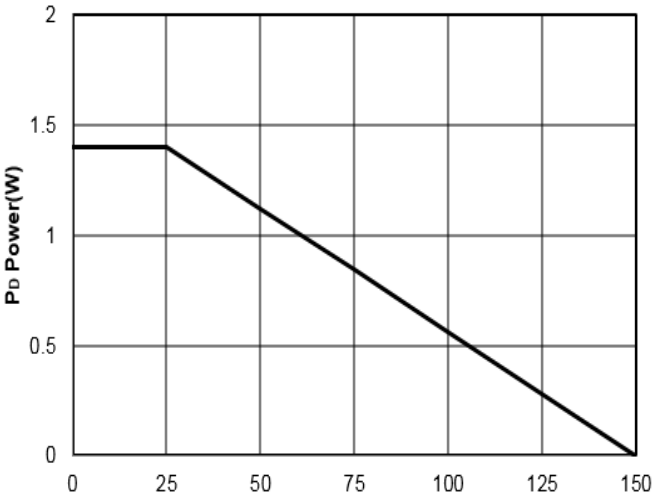


Figure1：T_J Junction Temperature（°C）

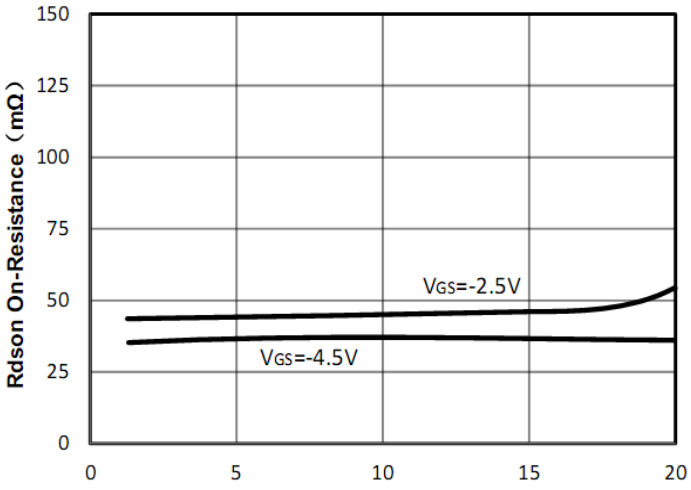


Figure2：$-I_D$ Drain Current（A）

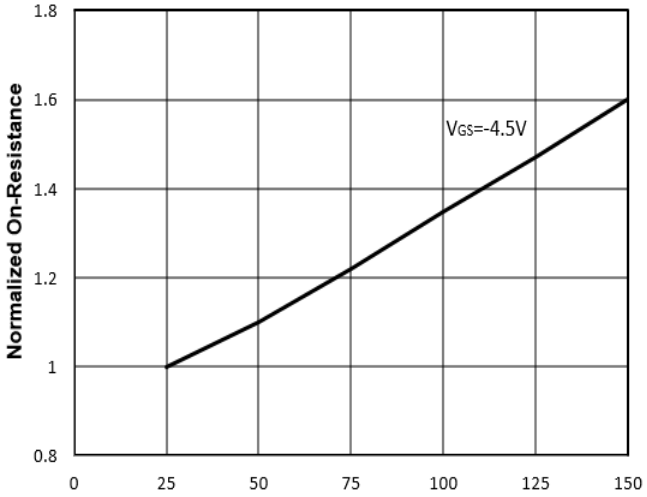


Figure3：T_J Junction Temperature（°C）

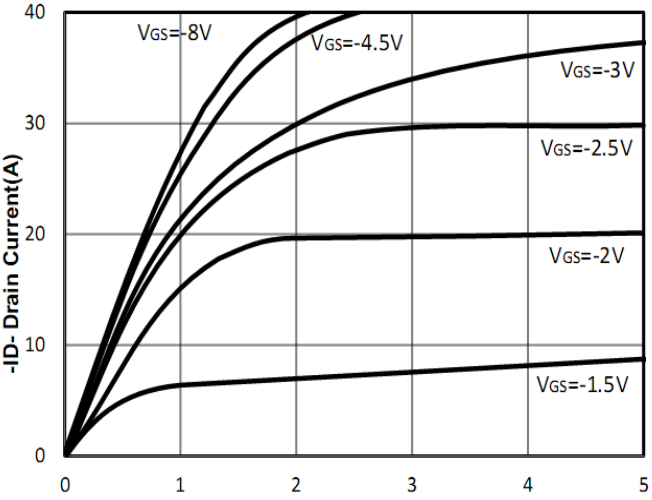


Figure4：$-V_{DS}$ DrainSource Voltage（V）

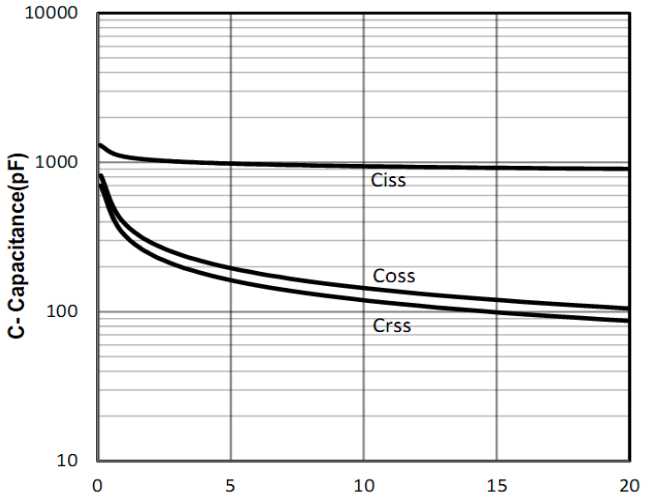


Figure5：$-V_{DS}$ Drain Source Voltage（V）

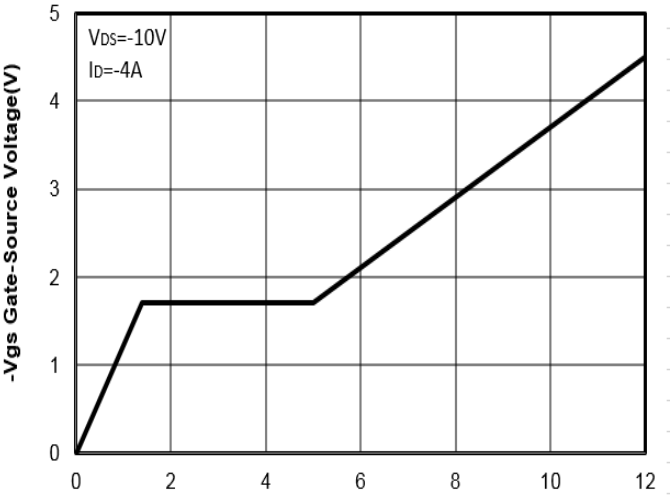


Figure6：Qg Gate Charge（nC）

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

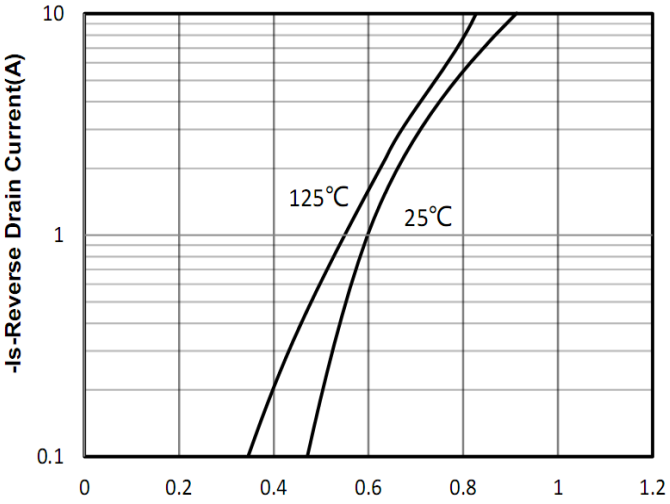


Figure7：-Vsd SourceDrain Voltage（V）

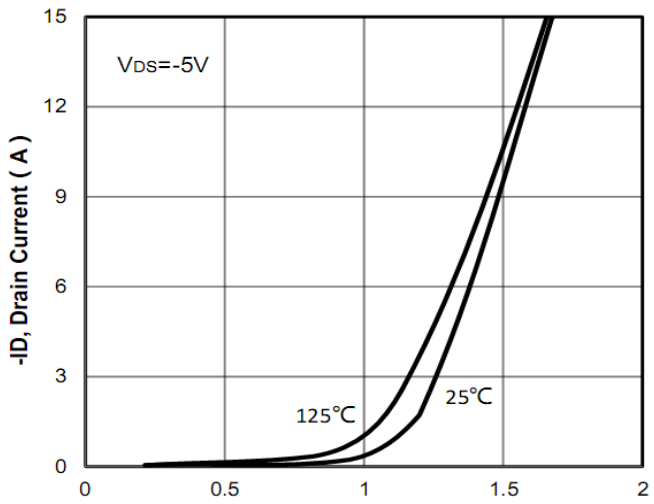


Figure8：-Vgs GateSource Voltage（V）

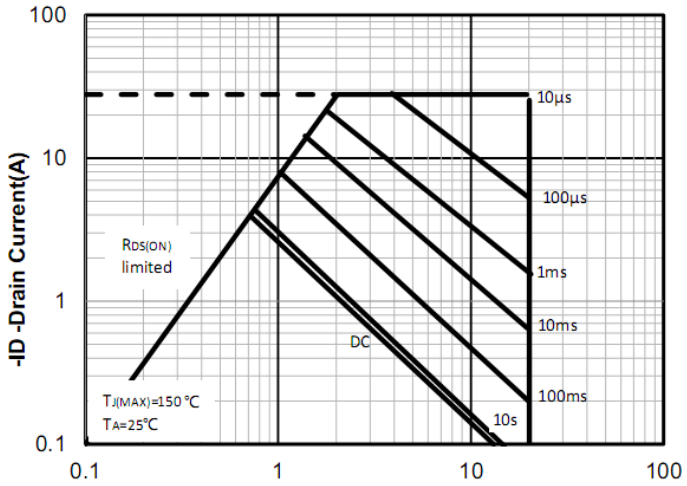


Figure9：-Vds Drain Source Voltage（V）

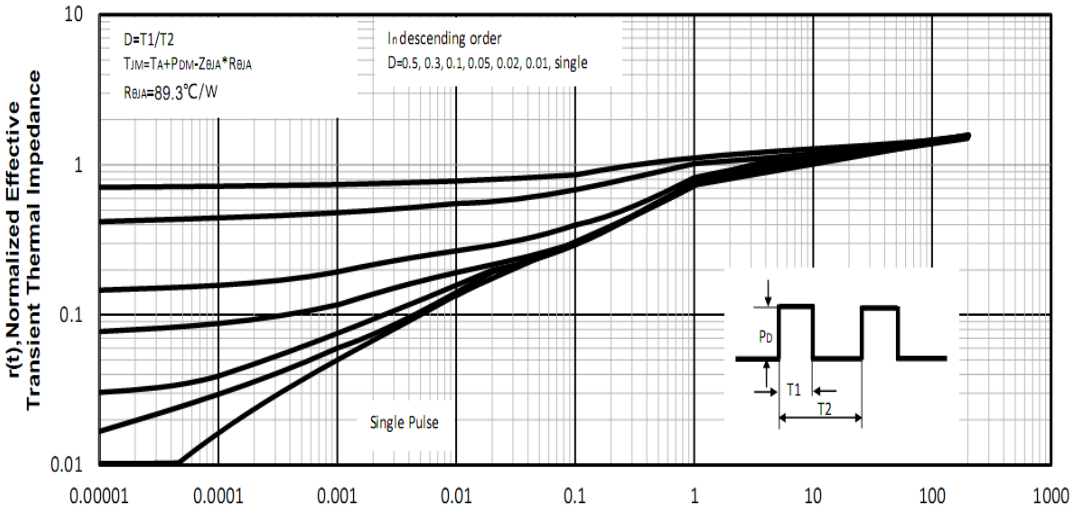


Figure10：Square Wave Pulse Duration（sec）

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

Test Circuit and Waveform:

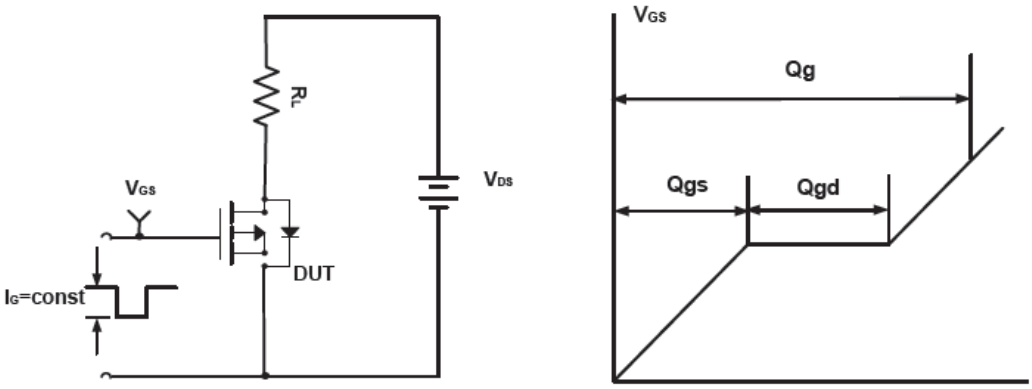


Figure A Gate Charge Test Circuit &Waveforms

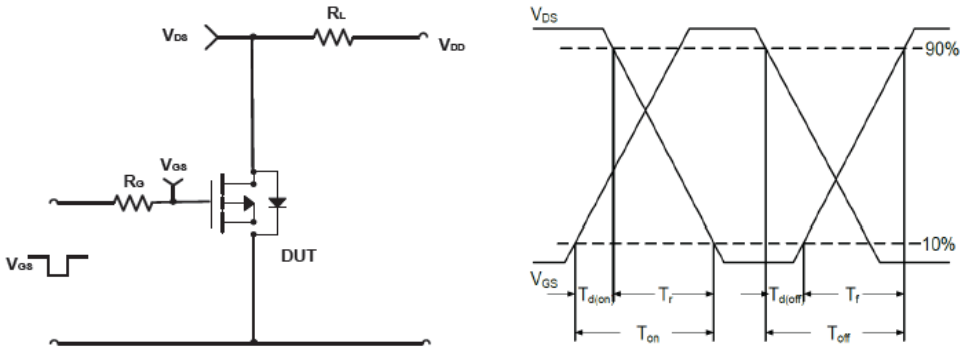


Figure B Switching Test Circuit & Waveforms

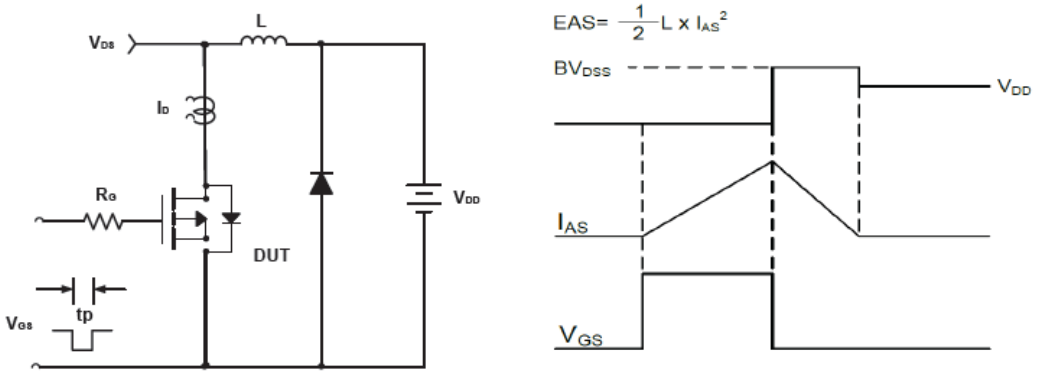
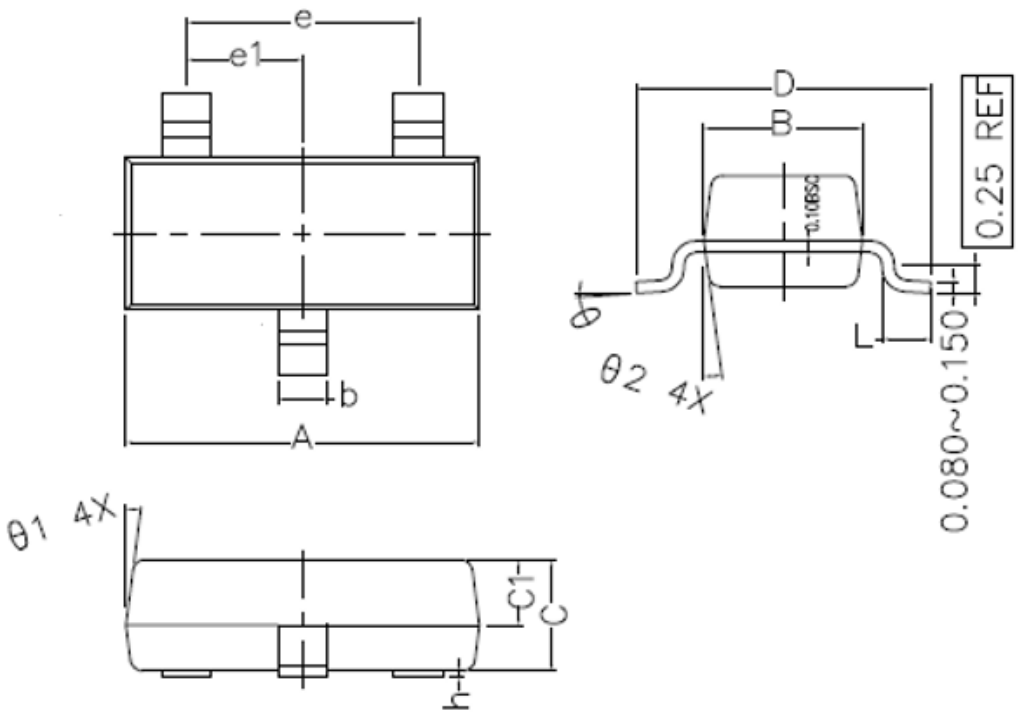


Figure C Unclamped Inductive Switching Circuit & Waveforms

-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°		