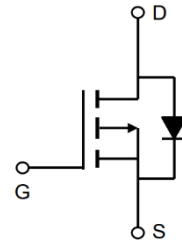




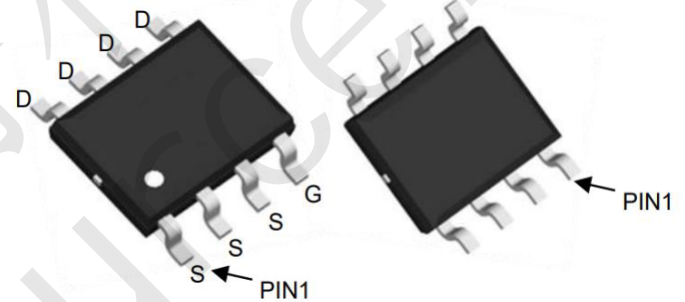
-60V P-Channel Enhancement Mode MOSFET AP15P06S

AP15P06S Description

The AP15P06S uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



PIN#1



AP15P06S General Features

$V_{DS} = -60V$ $I_D = -15A$

$R_{DS(ON)} < 28m\Omega$ @ $V_{GS} = -10V$ (Type: 20m Ω)

AP15P06S Application

BMS

Low voltage switch

Electric tool

AP15P06S Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP15P06S	SOP-8L	AP15P06S XXX YYY	3000

AP15P06S Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $-V_{GS} @ -10V^1$	-15	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $-V_{GS} @ -10V^1$	-8.5	A
IDM	Pulsed Drain Current ²	-45	A
EAS	Single Pulse Avalanche Energy ³	113	mJ
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	52.1	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	85	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.4	$^\circ C/W$



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AP15P06S Electrical Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-60	-68	---	V
ΔBVDSS/ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.035	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-12A	---	20	28	mΩ
		V _{GS} =-4.5V, I _D =-8A	---	26	33	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.0	-1.6	-2.5	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	4.28	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =-48V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =-48V, V _{GS} =0V, T _J =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =-10V, I _D =-18A	---	23	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	7	---	Ω
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-20V, V _{GS} =-4.5V, I _D =-12A	---	25	---	nC
Q _{gs}	Gate-Source Charge		---	6.7	---	
Q _{gd}	Gate-Drain Charge		---	5.5	---	
Td(on)	Turn-On Delay Time		---	38	---	
T _r	Rise Time	V _{DD} =-15V, V _{GS} =-10V, R _G =3.3Ω, I _D =-1A	---	23.6	---	ns
Td(off)	Turn-Off Delay Time		---	100	---	
T _f	Fall Time		---	6.8	---	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	3635	---	pF
C _{oss}	Output Capacitance		---	224	---	
Crss	Reverse Transfer Capacitance		---	141	---	
I _s	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	-35	A
ISM	Pulsed Source Current ^{2,5}		---	---	-70	A
VSD	Diode Forward Voltage ²	V _{GS} =0V, I _s =-1A, T _J =25°C	---	---	-1	V

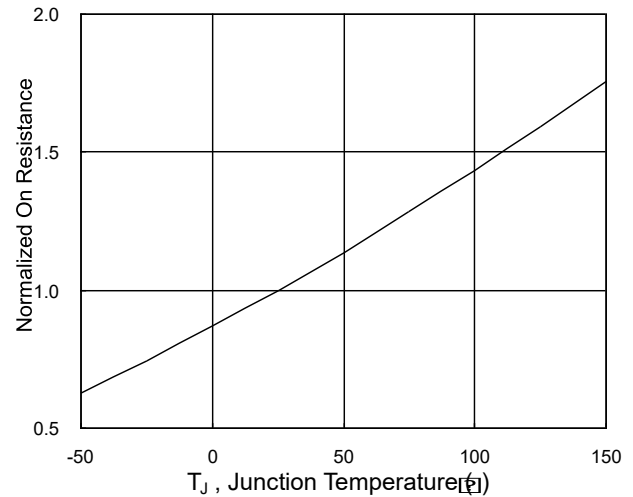
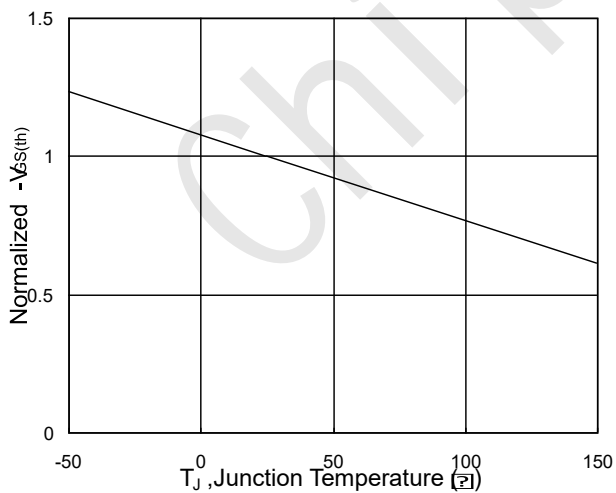
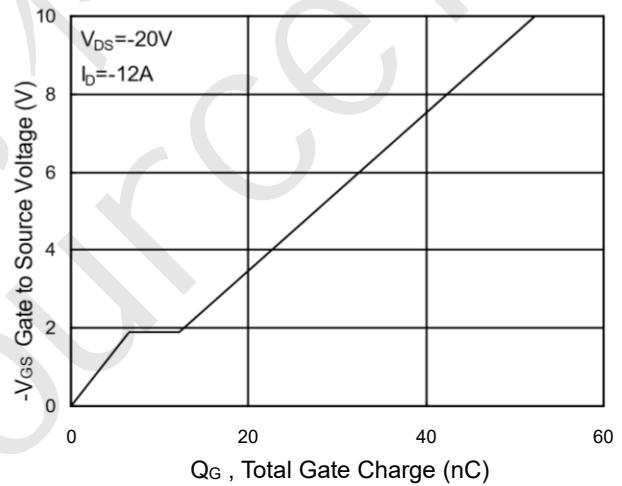
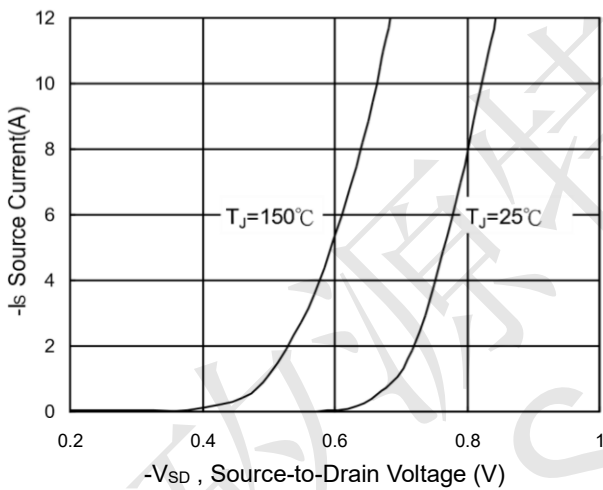
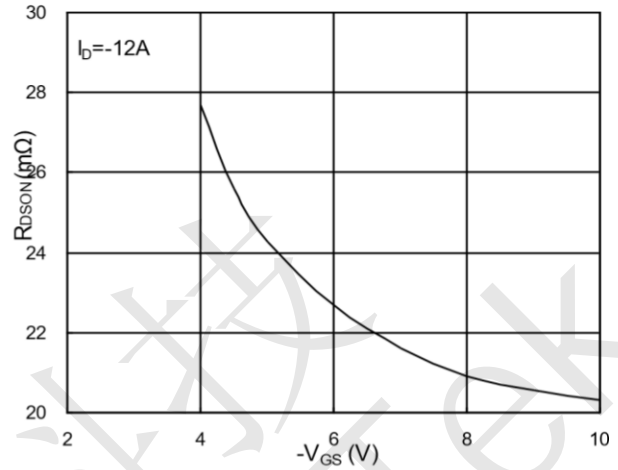
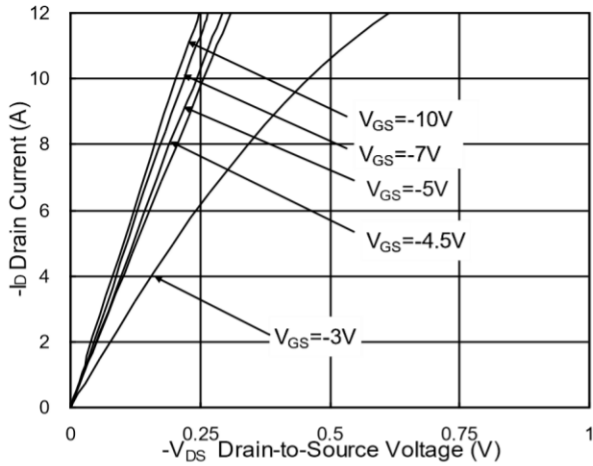
Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、 The EAS data shows Max. rating . The test condition is VDD=-48V,VGS =-10V,L=0.1mH,IAS =-47.6A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.



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AP15P06S Typical Characteristics





-60V P-Channel Enhancement Mode MOSFET AP15P06S

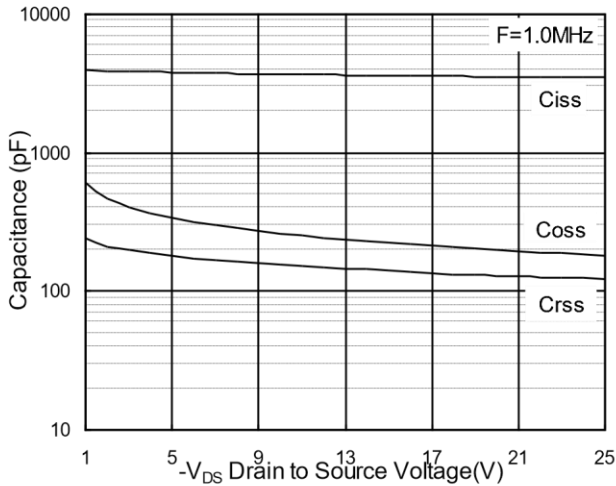


Fig.7 Capacitance

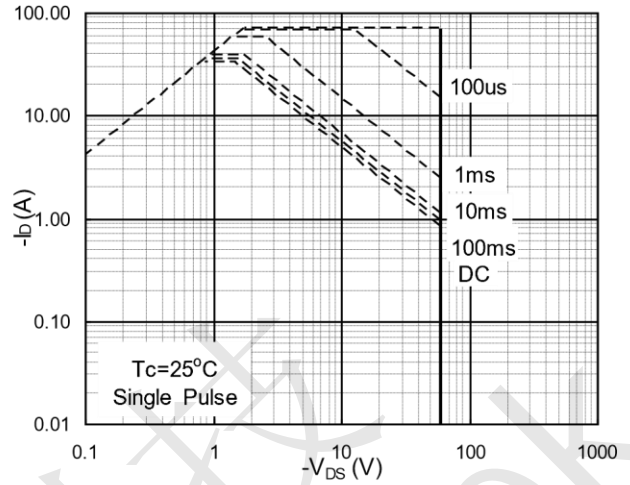


Fig.8 Safe Operating Area

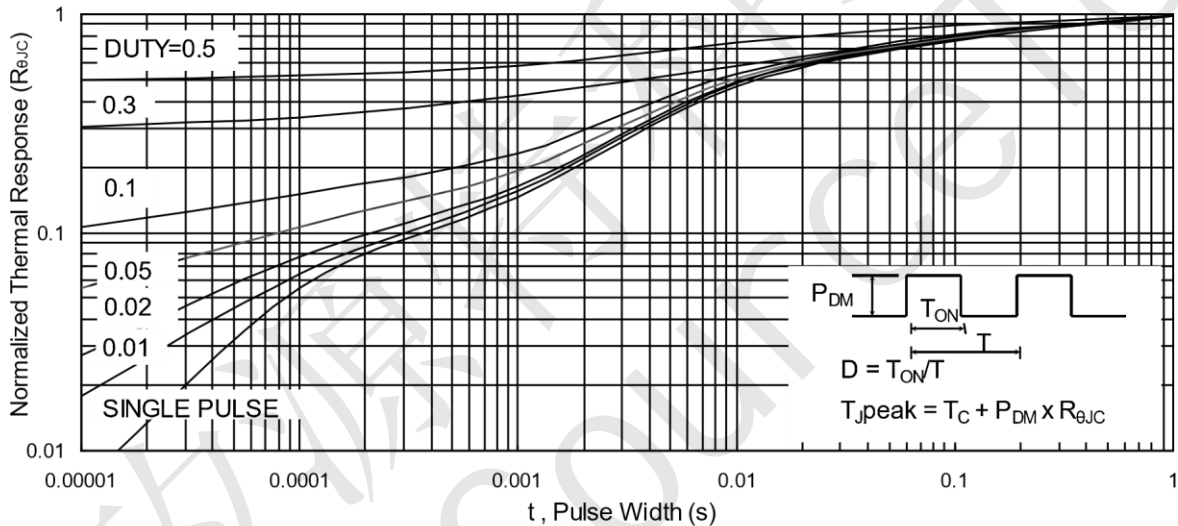


Fig.9 Normalized Maximum Transient Thermal Impedance

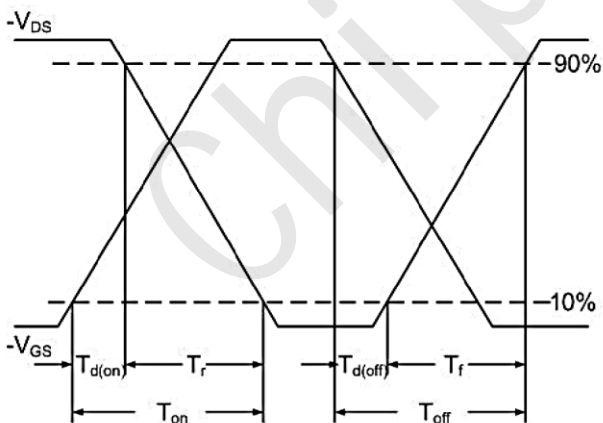


Fig.10 Switching Time Waveform

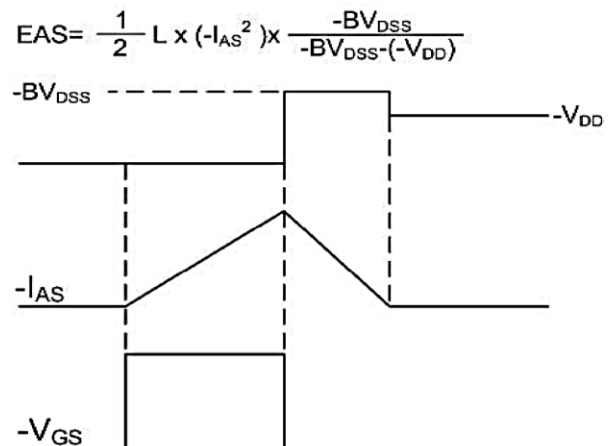


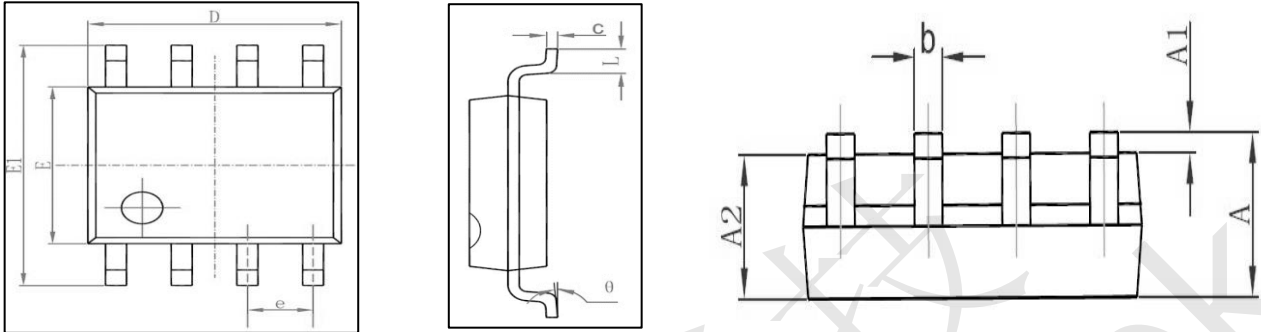
Fig.11 Unclamped Inductive Waveform

$$EAS = \frac{1}{2} L \times (-I_{AS}^2) \times \frac{-BV_{DSS}}{-BV_{DSS} - (-V_{DD})}$$

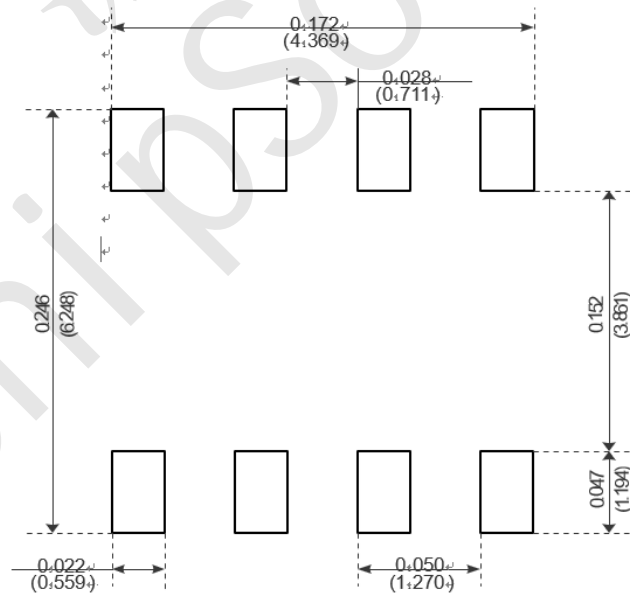


-60V P-Channel Enhancement Mode MOSFET AP15P06S

AP15P06S Package Mechanical Data-SOP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Recommended Minimum Pads



-60V P-Channel Enhancement Mode MOSFET AP15P06S

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-60V P-Channel Enhancement Mode MOSFET AP15P06S

Edition	Date	Change
Rve1.0	2022/1/31	Initial release

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