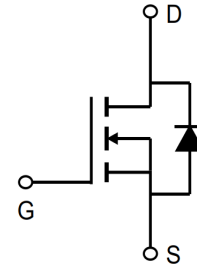


100V N-Channel Enhancement Mode MOSFET

Description

The AP15N10S 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.



General Features

$V_{DS} = 100V$ $I_D = 15A$

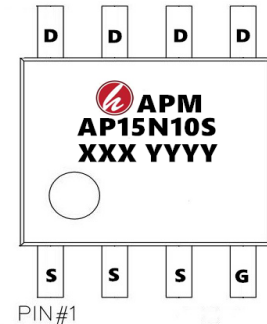
$R_{DS(ON)} < 120m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP15N10S	SOP-8	AP15N10S XXX YYYY	3000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	15	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	7	A
I_{DM}	Pulsed Drain Current ²	30	A
EAS	Single Pulse Avalanche Energy ³	6.1	mJ
I_{AS}	Avalanche Current	11	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	1.5	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	85	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	36	$^\circ\text{C/W}$

100V N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	100	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.098	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =2A	---	90	112	mΩ
		V _{GS} =4.5V, I _D =1A	---	95	120	mΩ
V _{GS(th)}	Gate Threshold Voltage		1.0	1.5	2.5	V
		V _{GS} =V _{DS} , I _D =250uA				
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4.57	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =80V, V _{GS} =0V, T _J =25°C	---	---	10	uA
		V _{DS} =80V, V _{GS} =0V, T _J =55°C	---	---	100	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =2A	---	12	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	2	4	
Q _g	Total Gate Charge (10V)		---	19.5	---	nC
Q _{gs}	Gate-Source Charge	V _{DS} =60V, V _{GS} =10V, I _D =2A	---	3.2	---	
Q _{gd}	Gate-Drain Charge		---	3.6	---	
T _{d(on)}	Turn-On Delay Time		---	16.2	---	ns
T _r	Rise Time	V _{DD} =50V, V _{GS} =10V, R _G =3.3	---	3	---	
T _{d(off)}	Turn-Off Delay Time	I _D =1A	---	44	---	
T _f	Fall Time		---	2.6	---	
C _{iss}	Input Capacitance		---	1535	---	pF
C _{oss}	Output Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	60	---	
C _{rss}	Reverse Transfer Capacitance		---	37.4	---	
I _S	Continuous Source Current ^{1,5}		---	---	4	A
I _{SM}	Pulsed Source Current ^{2,5}	V _G =V _D =0V, Force Current	---	---	8	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch² 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 V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=11A
- 4.The power dissipation is limited by 175°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

Typical Characteristics

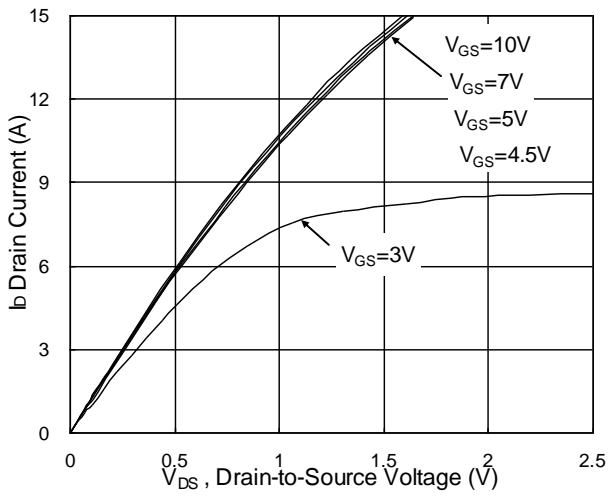


Fig.1 Typical Output Characteristics

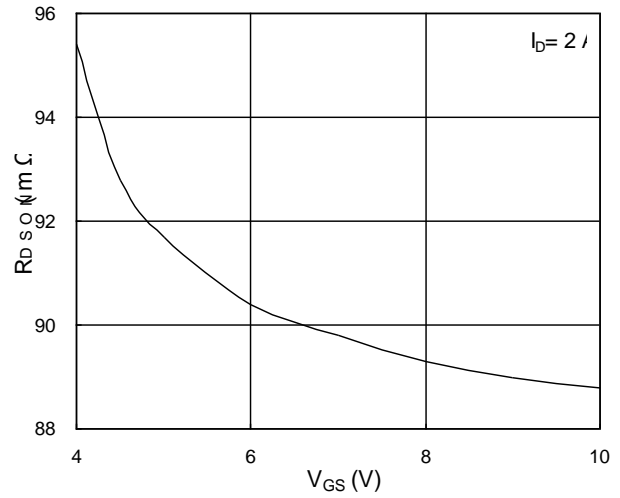


Fig.2 On-Resistance vs. Gate-Source

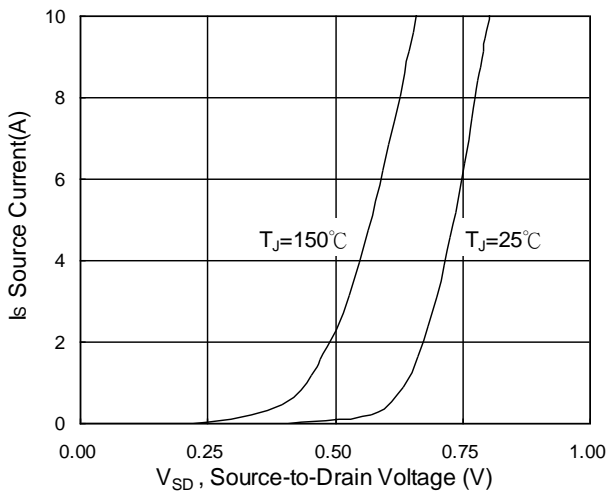


Fig.3 Forward Characteristics Of Reverse

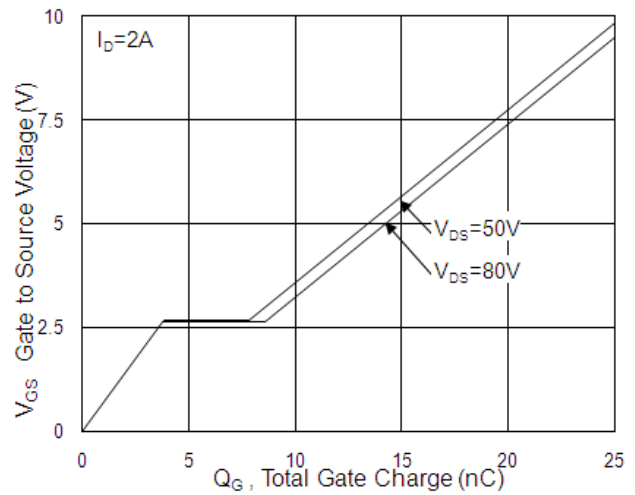


Fig.4 Gate-Charge Characteristics

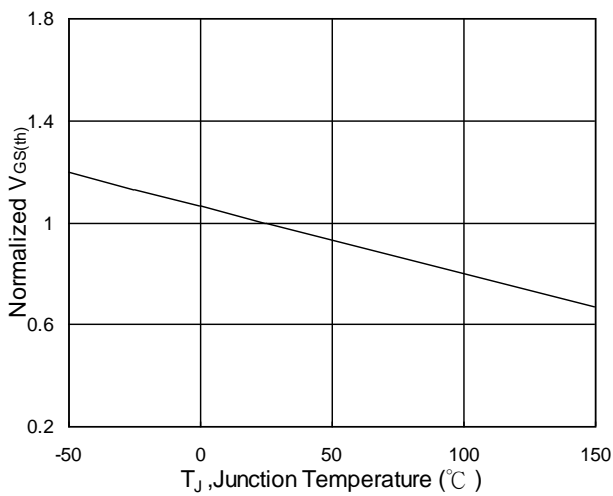


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

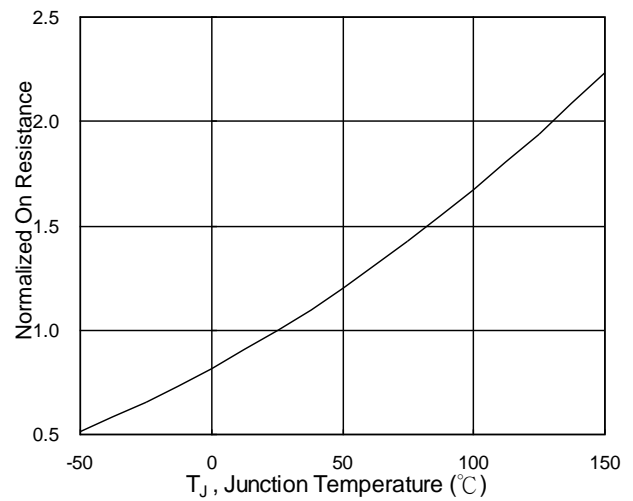


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

100V N-Channel Enhancement Mode MOSFET

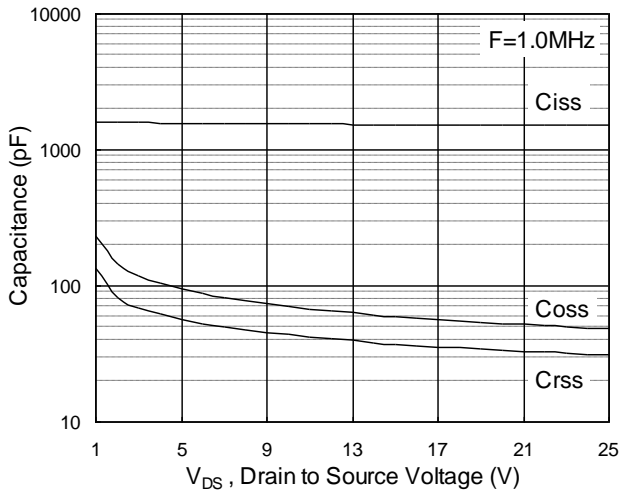


Fig.7 Capacitance

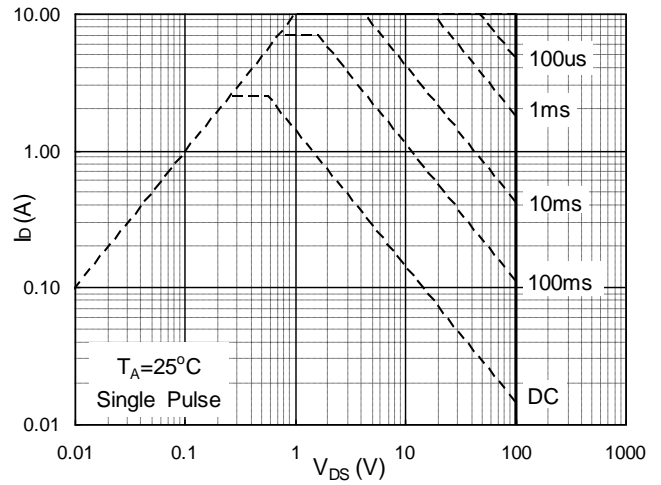


Fig.8 Safe Operating Area

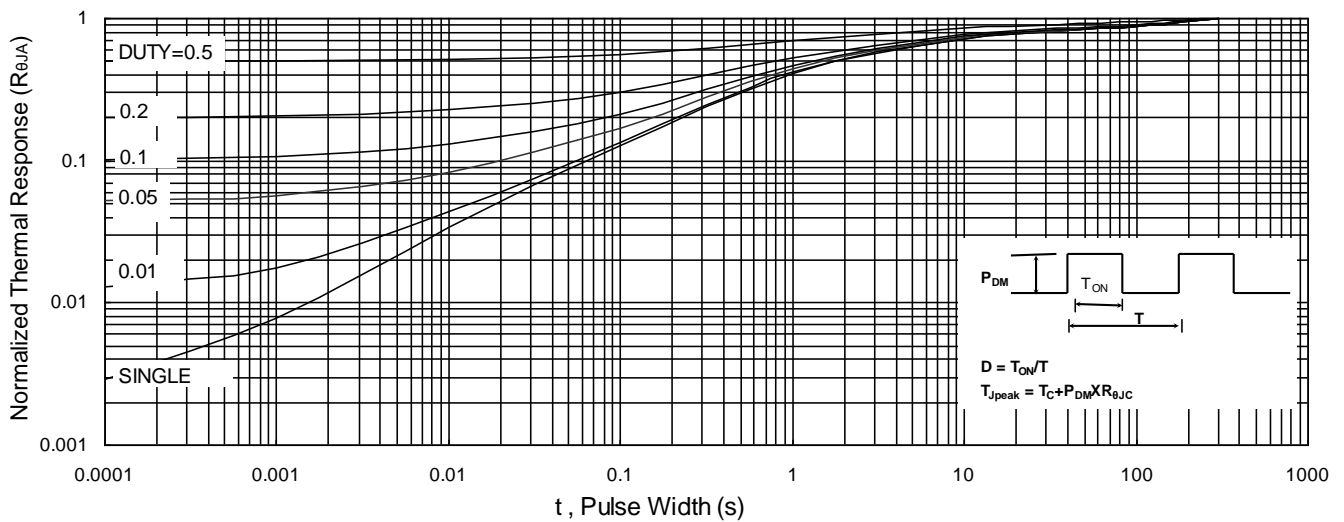


Fig.9 Normalized Maximum Transient Thermal Impedance

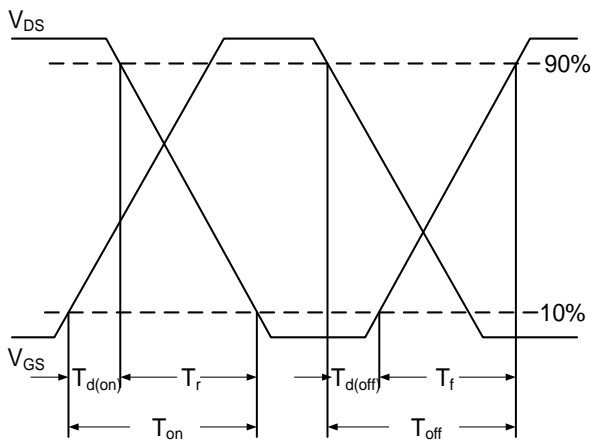


Fig.10 Switching Time Waveform

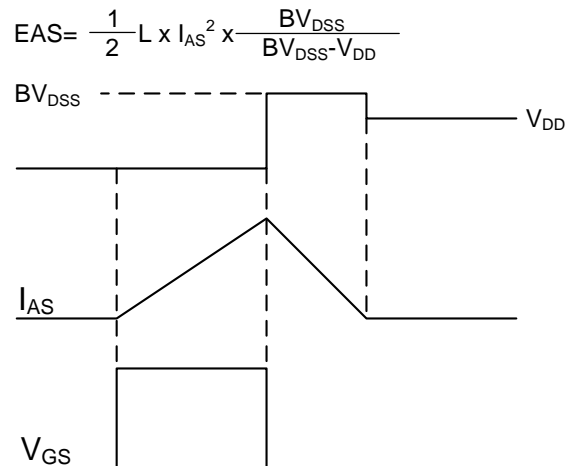
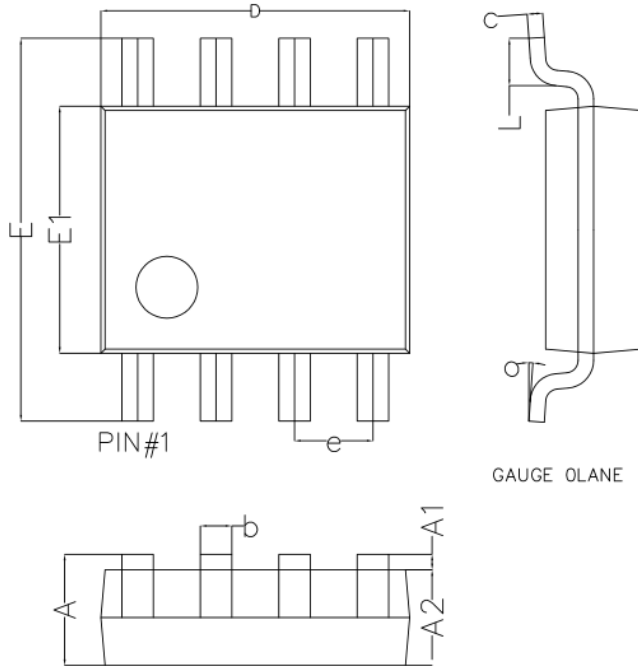


Fig.11 Unclamped Inductive Switching Waveform

PACK SOP-8

SOP8 Package outline



Symbol	Dim in mm		
	Min	Nor	Max
A	1.350	1.550	1.750
A1	0.100	0.175	0.250
A2	1.350	1.450	1.550
b	0.330	0.420	0.510
c	0.170	0.210	0.250
D	4.800	4.900	5.000
e	1.270 (BSC)		
E	5.800	6.000	6.200
E1	3.800	3.900	4.000
L	0.400	0.835	1.2700
o	0°	4°	8°

100V N-Channel Enhancement Mode MOSFET**Attention**

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