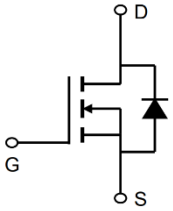
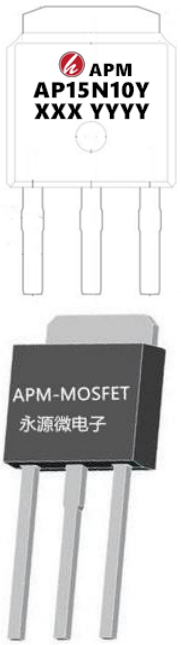
AP15N10Y

100V N-Channel Enhancement Mode MOSFET

Description

The AP15N10Y 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 =14.1A

$R_{DS(ON)}$ < 105mΩ @ V_{GS}=10V

Application

Load Switch

PWM Application

Power management

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP15N10Y	TO-251-3L	AP15N10Y XXX YYYY	4200

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	14.1	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	8.1	A
I_{DM}	Pulsed Drain Current[1]	28	A
P_D@T_C=25℃	Total Power Dissipation	20.8	W
P_D@T_A=25℃	Total Power Dissipation[3]	2	W
E_{AS}	Single Pulse Avalanche Energy[4]	8	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
Rthj-c	Maximum Thermal Resistance, Junction-case	6	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62.5	℃/W

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Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	107	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=100V, V_{GS}=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	1.5	2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=10A	-	88	105	mΩ
		V_{GS}=4.5V, I_D=8A	-	93	125	mΩ
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	610	-	pF
Coss	Output Capacitance		-	40	-	pF
Crss	Reverse Transfer Capacitance		-	25	-	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=10A, V_{GS}=10V	-	12	-	nC
Q_{gs}	Gate-Source Charge		-	2.2	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	2.5	-	nC
td(on)	Turn-on Delay Time	V_{DS}=30V, I_D=5A, R_G=1.8Ω, V_{GS}=10V	-	7	-	ns
t_r	Turn-on Rise Time		-	5	-	ns
td(off)	Turn-off Delay Time		-	16	-	ns
t_f	Turn-off Fall Time		-	6	-	ns
IS	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	-	-	10	A
ISM	Pulsed Source Current[2,5]		-	-	40	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V, I_S=10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=10A, dI/dt=100A/μs	-	21	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	21	-	nC

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 V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=11A

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.

Typical Characteristics

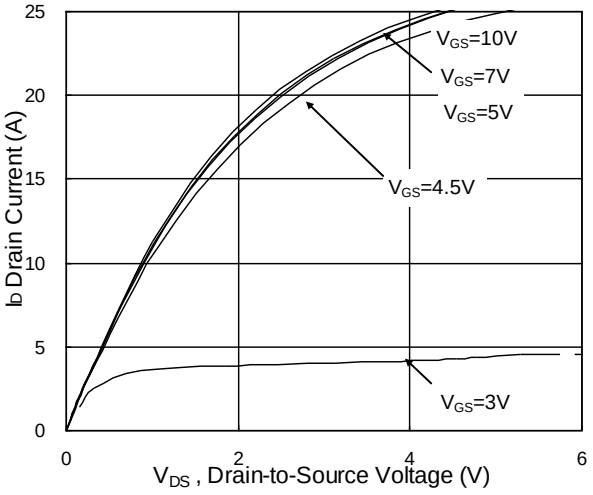

Fig.1 Typical Output Characteristics

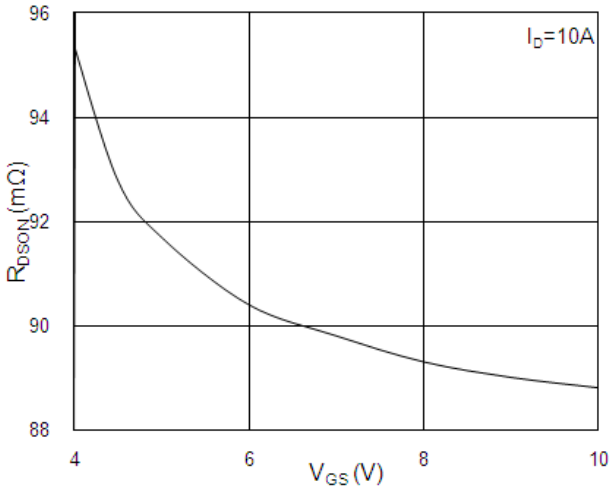

Fig.2 On-Resistance vs. Gate-Source

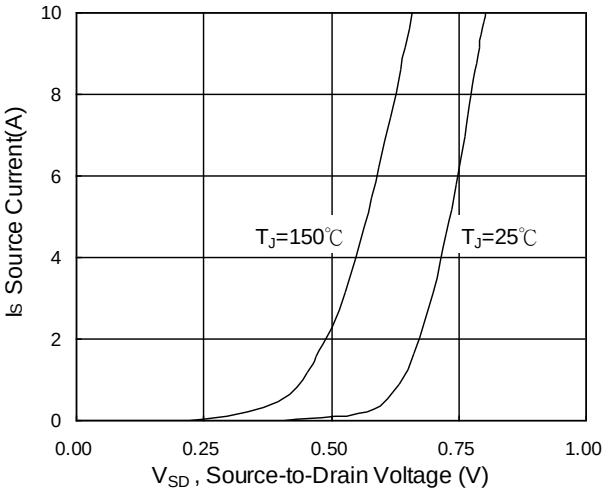

Fig.3 Forward Characteristics Of Reverse

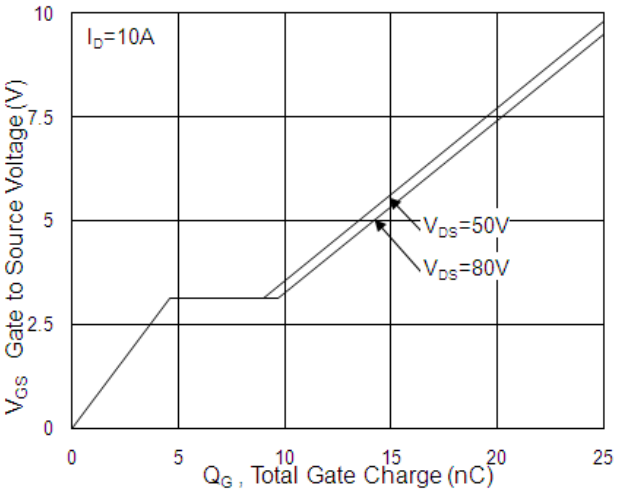

Fig.4 Gate-Charge Characteristics

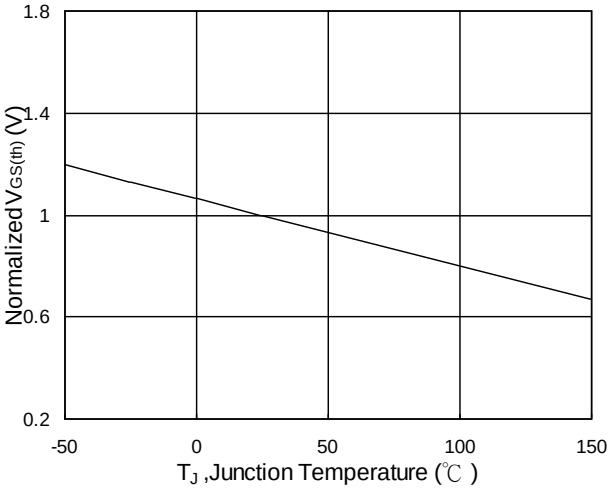

Fig.5 Normalized $V_{GS(th)}$ vs. T_J

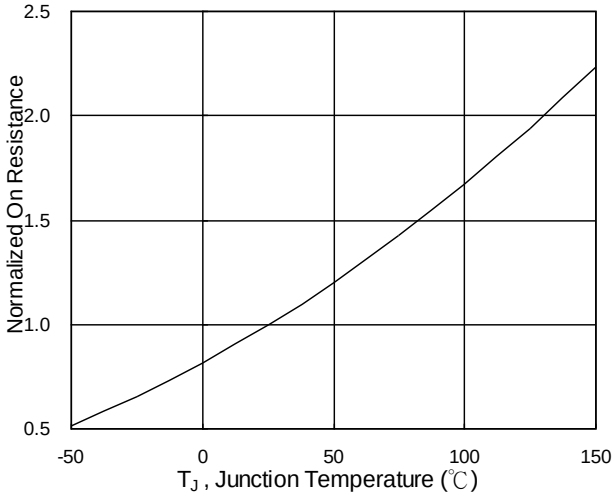

Fig.6 Normalized R_{DSON} vs. T_J

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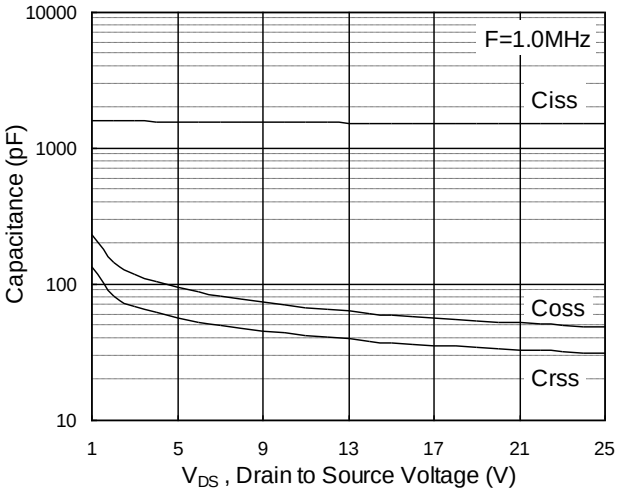


Fig.7 Capacitance

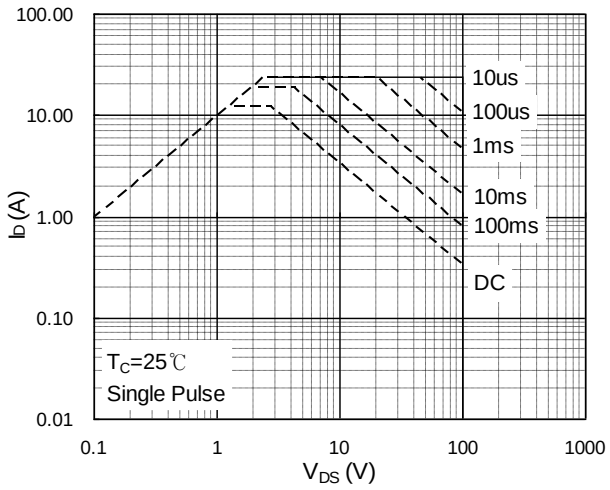


Fig.8 Safe Operating Area

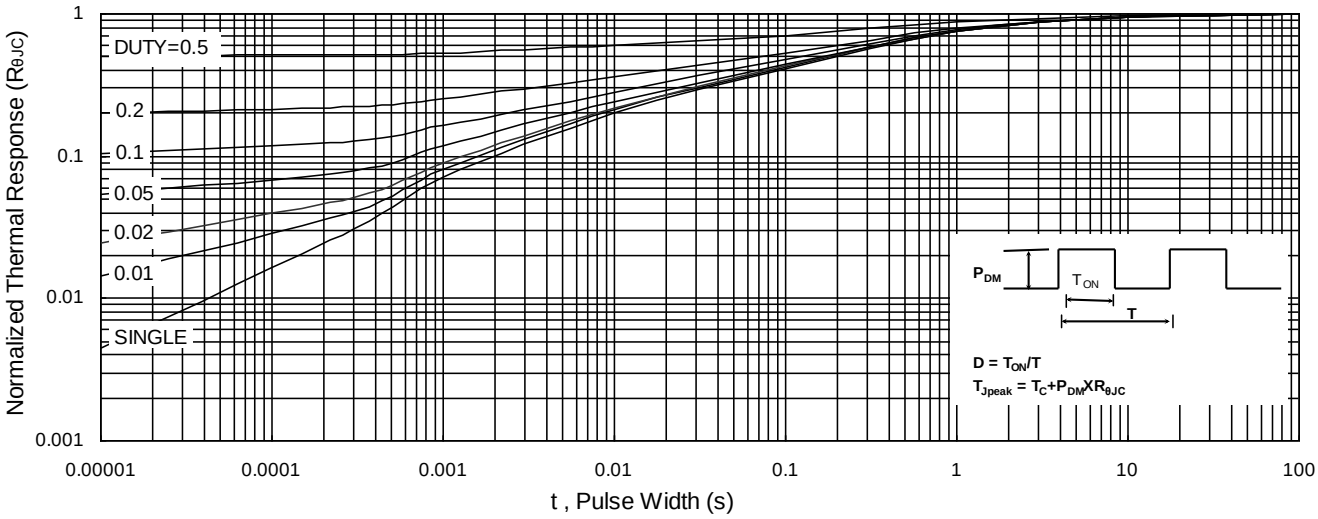


Fig.9 Normalized Maximum Transient Thermal Impedance

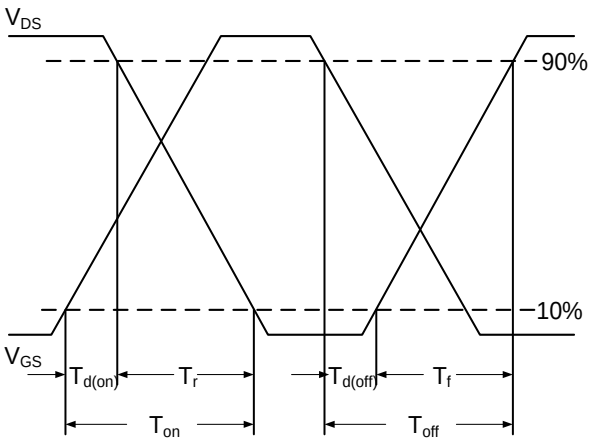


Fig.10 Switching Time Waveform

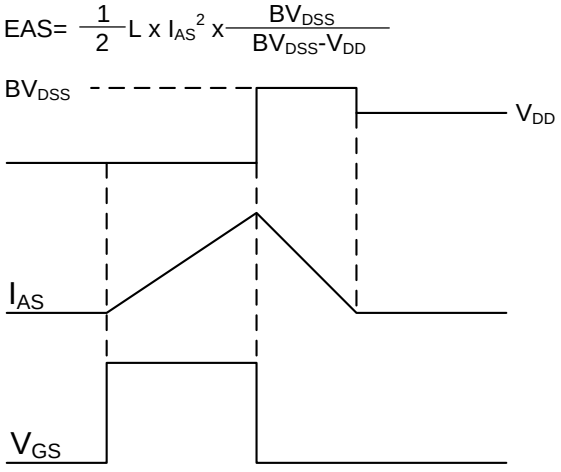
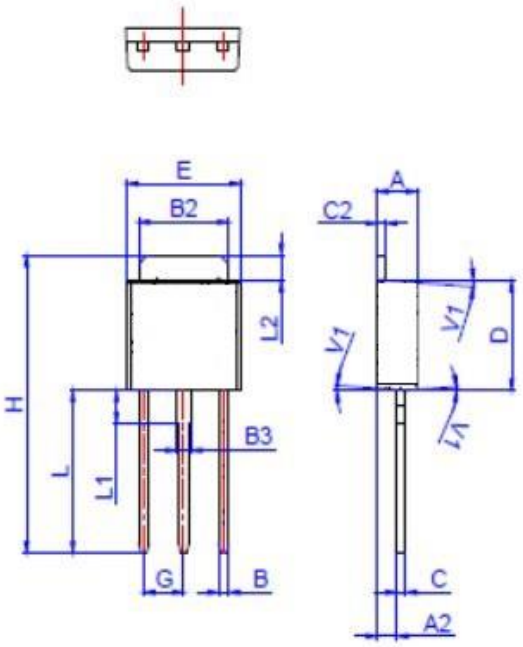


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data



TO-251

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.095
A2	0.90		1.20	0.035		0.047
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
B3	0.76		0.85	0.030		0.033
C	0.45		0.62	0.018		0.024
C2	0.48		0.62	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.70	0.252		0.264
G		2.30			0.091	
H	16.0		17.0	0.630		0.669
L	8.90		9.40	0.350		0.370
L1	1.80		1.90	0.071		0.075
L2	1.37		1.50	0.054		0.059
V1		4°			4°	

Package Information -TO-251

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	80		

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Edition	Date	Change
RVE1.0	2020/04/1	Initial release