

150V N-Channel Enhancement Mode MOSFET

Description

The AP30N15D uses advanced **APM-SGT II** 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

$V_{DS} = 150V$ $I_D = 30A$

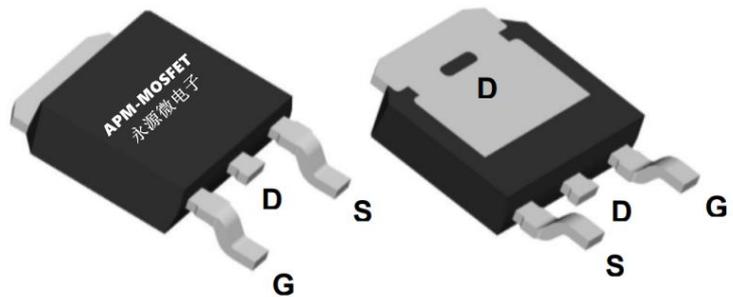
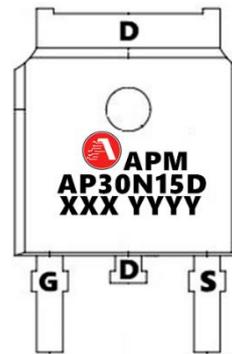
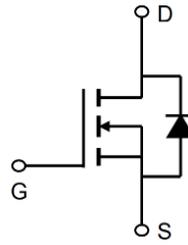
$R_{DS(ON)} < 45m\Omega @ V_{GS}=10V$ (Type: 30m Ω)

Application

Automotive lighting

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP30N15D	TO-252-3L	AP30N15D XXX YYYY	2500

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Drain Current, $V_{GS} @ 10V$	30	A
$I_D @ T_C=100^\circ C$	Drain Current, $V_{GS} @ 10V$	21	A
IDM	Pulsed Drain Current ¹	90	A
IAS	Avalanche Current	15	A
EAS	Single Pulse Avalanche Energy ³	61	mJ
$P_D @ T_C=25^\circ C$	Total Power Dissipation	60	W
TSTG	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Maximum Thermal Resistance, Junctionambient	62.5	°C/W
$R_{\theta JC}$	Maximum Thermal Resistance, Junction-case	2.5	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	150	160	---	V
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =10A	---	30	45	mΩ
	Static Drain-Source On-Resistance ²	V _{GS} =4.5V , I _D =10A	---	53	70	mΩ
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.7	2.5	V
IDSS	Drain-Source Leakage Current	V _{DS} =120V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =120V , 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} =5V , I _D =10A	---	25	---	S
Qg	Total Gate Charge	V _{DS} =75V , V _{GS} =10V , I _D =10A	---	19	---	nC
Qgs	Gate-Source Charge		---	4.5	---	
Qgd	Gate-Drain Charge		---	2.6	---	
Td(on)	Turn-On Delay Time	V _{DD} =75V , V _{GS} =10V , R _G =3.3 I _D =10A	---	18	---	ns
Tr	Rise Time		---	5.8	---	
Td(off)	Turn-Off Delay Time		---	26.5	---	
Tf	Fall Time		---	4.5	---	
Ciss	Input Capacitance	V _{DS} =25V , V _{GS} =0V , f=1MHz	---	1050	---	pF
Coss	Output Capacitance		---	119	---	
Crss	Reverse Transfer Capacitance		---	4	---	
IS	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	30	A
VSD	Diode Forward Voltage ²	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1.2	V
trr	Reverse Recovery Time	I _F =10A , di/dt=100A/μs , T _J =25°C	---	45	---	nS
Q _{rr}	Reverse Recovery Charge		---	138	---	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}=100V,V_{GS}=10V,L=0.5mH,I_{AS}=16A
- 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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Typical Characteristics

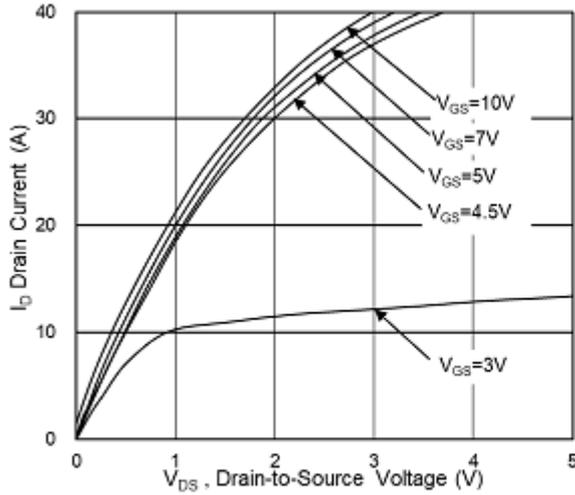


Fig.1 Typical Output Characteristics

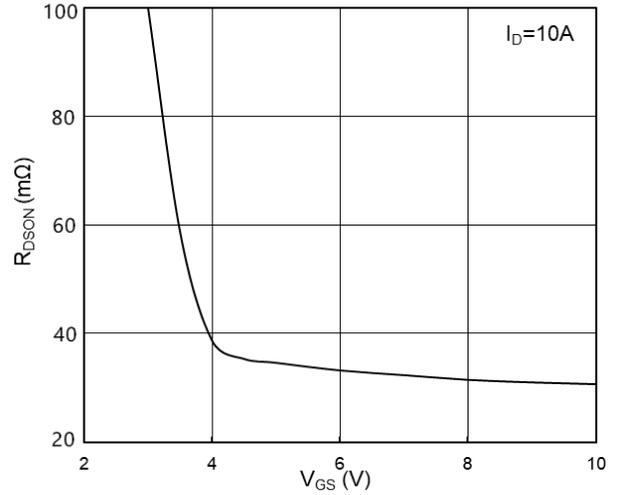


Fig.2 On-Resistance vs G-S Voltage

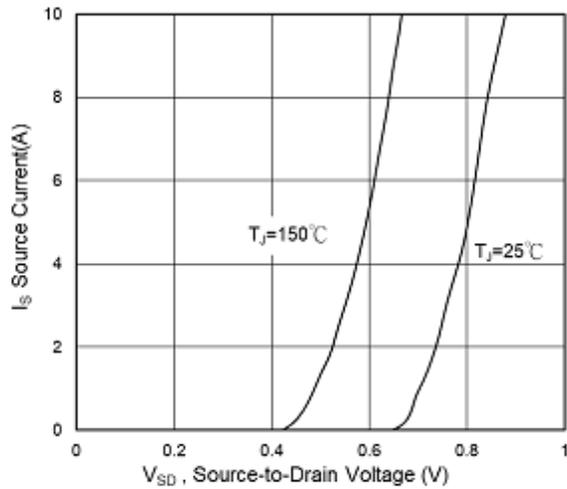


Fig.3 Source Drain Forward Characteristics

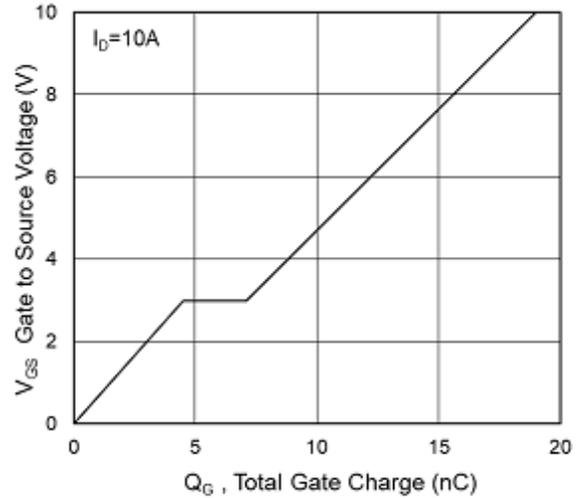


Fig.4 Gate-Charge Characteristics

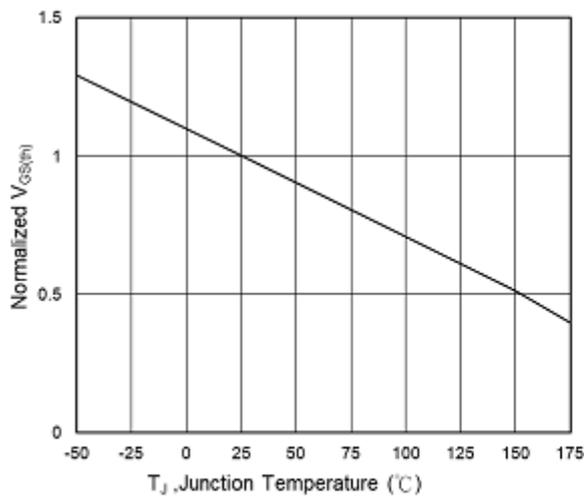


Fig.5 Normalized V_{GS(th)} vs T_J

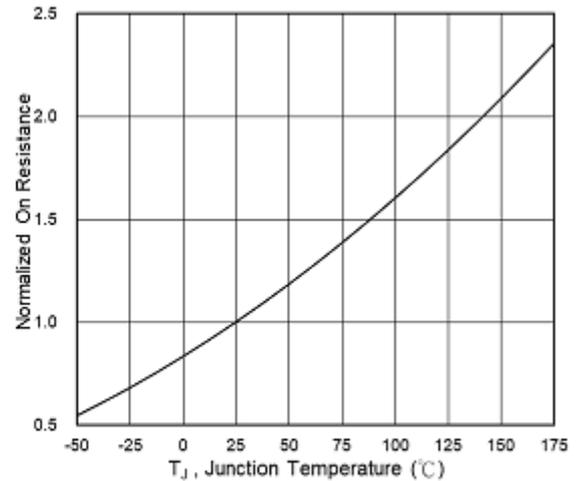


Fig.6 Normalized R_{DSON} vs T_J

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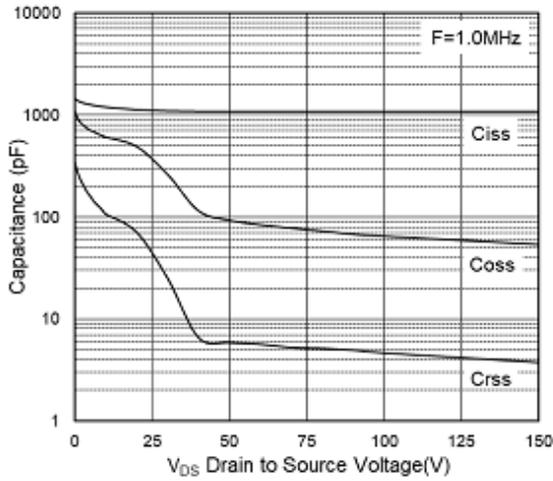


Fig.7 Capacitance

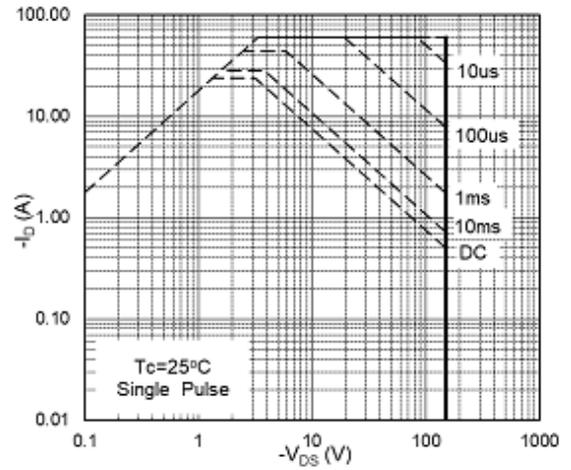


Fig.8 Safe Operating Area

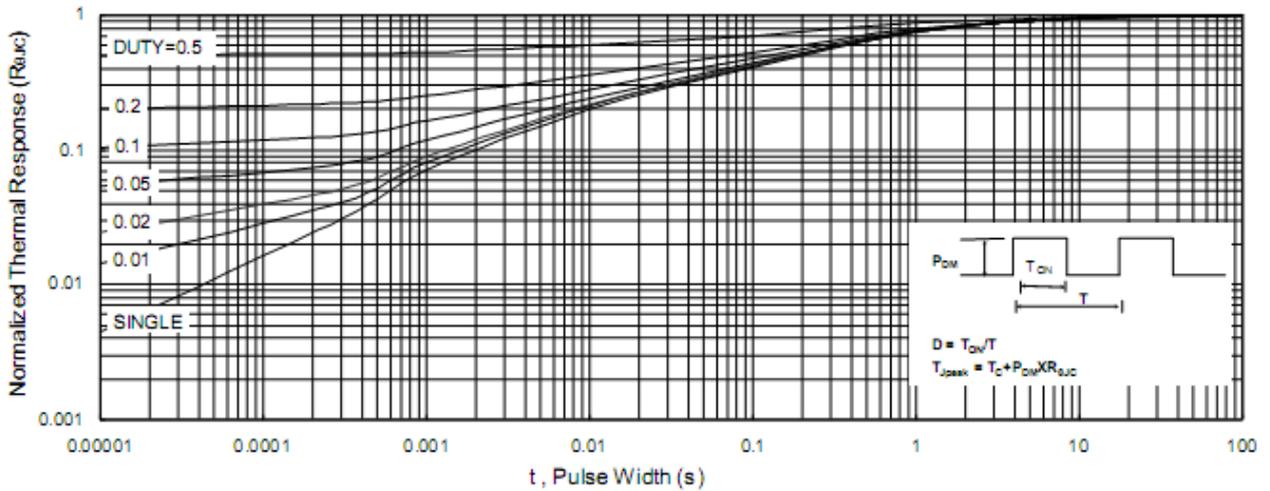


Fig.9 Normalized Maximum Transient Thermal Impedance

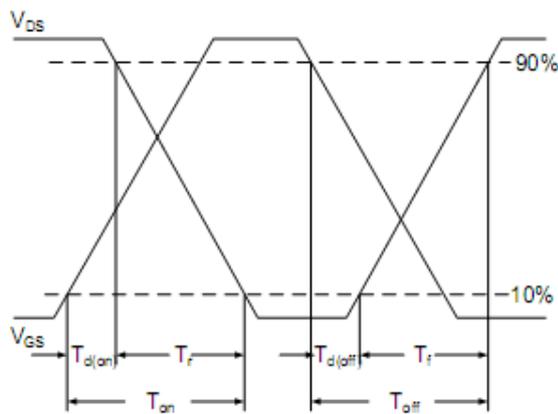


Fig.10 Switching Time Waveform

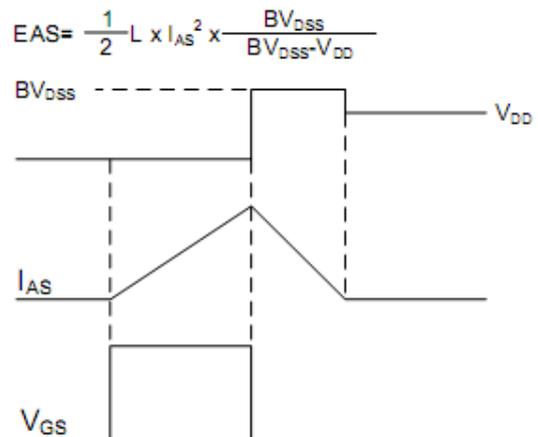
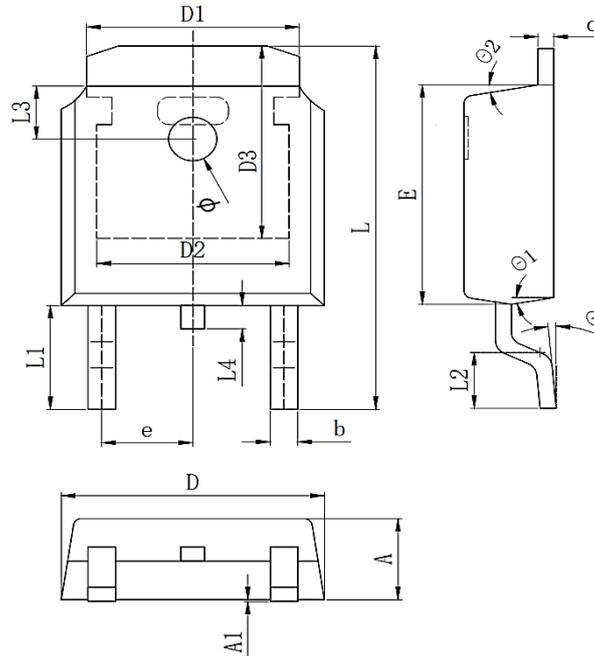


Fig.11 Unclamped Inductive Switching Waveform

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Package Mechanical Data-TO-252-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	2.1	2.3	2.5
A1	0	0.064	0.128
b	0.64	0.75	0.86
c	0.45	0.52	0.6
D	6.4	6.6	6.8
D1	5.33REF		
D2	4.83REF		
D3	5.25REF		
E	5.9	6.1	6.3
e	2.286TYP		
L	9.8	10.1	10.4
L1	2.888REF		
L2	1.4	1.5	1.7
L3	1.65REF		
L4	0.6	0.8	1
φ	1.1	1.2	1.3
θ	0°		10°
θ1	5°		10°
θ2	5°		10°

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Edition	Date	Change
REV1.0	2020/9/11	Initial release
REV1.1	2026/1/9	Reduce RDS

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