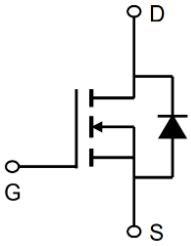
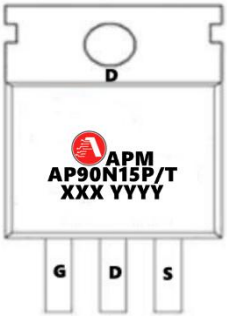
AP90N15P/T

150V N-Channel Enhancement Mode MOSFET

Description

The AP90N15P/T uses advanced **APM-SGT II** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = 150V I_D =90A

$R_{DS(ON)}$ <18mΩ@ V_{GS}=10V **（Type：15mΩ）**

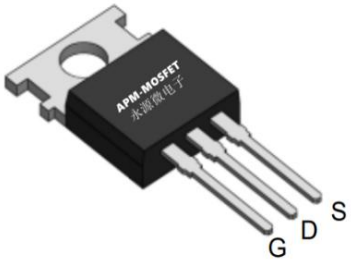
Application

Automative lighting

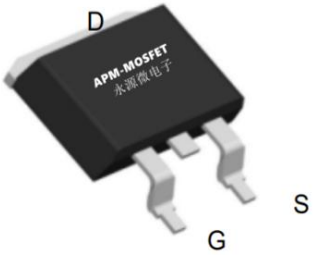
Load switch

Uninterruptible power supply

TO220-3L



TO263-3L



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP90N15P	TO220-3L	AP90N15P XXX YYYY	1000
AP90N15T	TO263-3L	AP90N15T XXX YYYY	800

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage	150	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	90	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	56	A
IDM	Pulsed Drain Current[1]	240	A
EAS	Single pulsed avalanche energy	280	mJ
P_D@T_C=25℃	Total Power Dissipation	214	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Maximum Thermal Resistance, Junctionambient	0.7	℃/W
RθJC	Maximum Thermal Resistance, Junction-case	62.5	℃/W

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

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	VGS=0 V, ID=250 μA	150	167		V
VGS(th)	Gate threshold voltage	VDS=VGS, ID=250 μA	2.0	3.0	4.0	V
RDS(ON)	Drain-source on-state resistance	VGS=10 V, ID=30 A		16	18	mΩ
IGSS	Gate-source leakage current	VGS=20 V			100	nA
		VGS=-20 V			-100	
IDSS	Drain-source leakage current	VDS=150 V, VGS=0 V			1	μA
RG	Gate resistance	f=1 MHz, Open drain		4		Ω
Ciss	Input capacitance	VGS=0V, VDS=75V, f=1MHz		2275		pF
Coss	Output capacitance			165		pF
Crss	Reverse transfer capacitance			5.5		pF
td(on)	Turn-on delay time	VGS=10V, VDS=75 V, RG=2 Ω, ID=30 A		10		ns
tr	Rise time			29		ns
td(off)	Turn-off delay time			16		ns
tf	Fall time			15		ns
Qg	Total gate charge	VGS=10V, VDS=75V, ID=30A		27		nC
Qgs	Gate-source charge			9		nC
Qgd	Gate-drain charge			2		nC
trr	Reverse recovery time	VR=75V, IS=20A, di/dt=100A/μs		90		ns
Qrr	Reverse recovery charge			234		nC
Irrm	Peak reverse recovery current			210		A
VSD	Diode forward voltage	IS=30A, VGS=0 V			1.2	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=72V,VGS=10V,L=0.1mH,IAS=40A

4、The power dissipation is limited by 150℃ 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

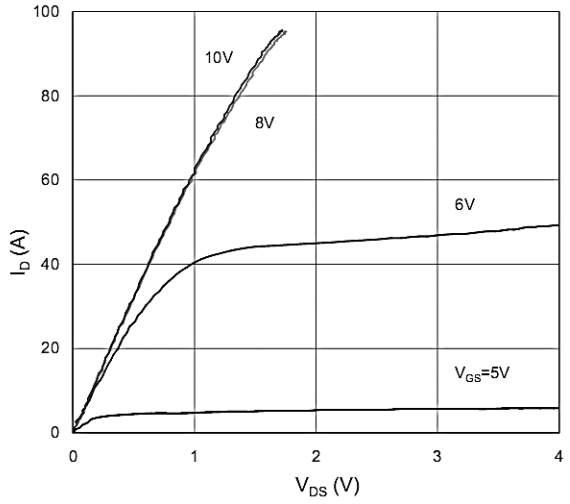


Figure 1. Typical Output Characteristics

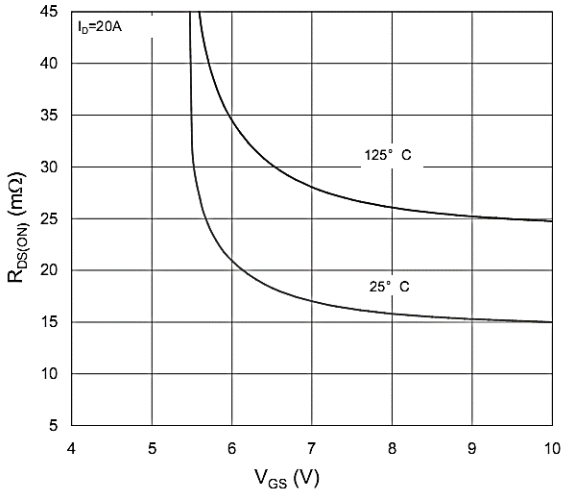


Figure 2. On-Resistance vs. Gate-Source Voltage

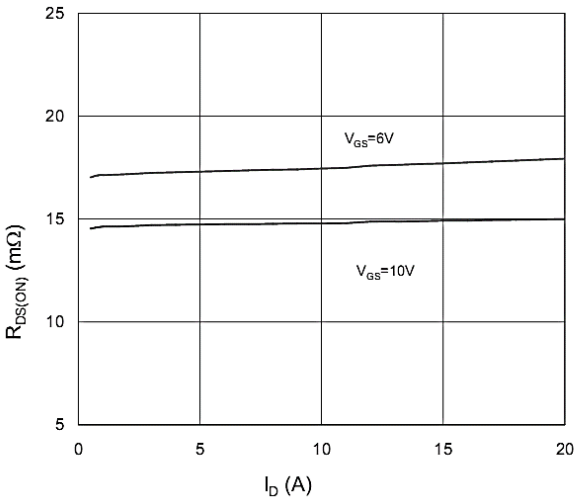


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

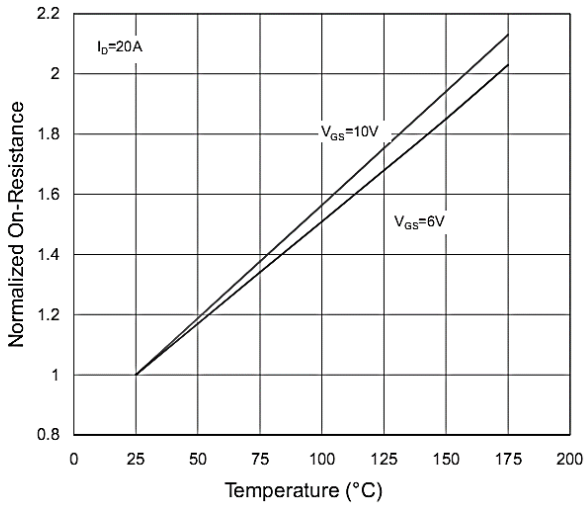


Figure 4. Normalized On-Resistance vs. Junction Temperature

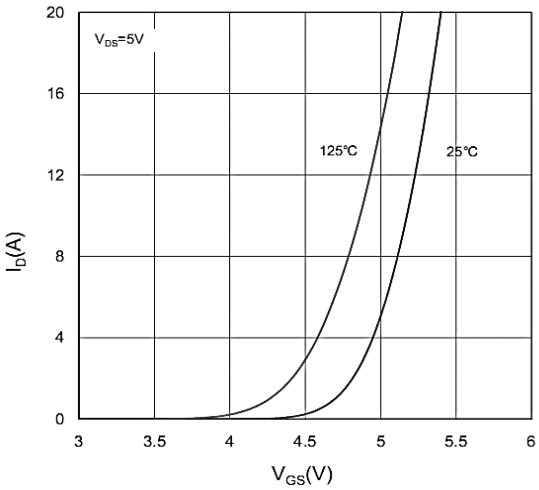


Figure 5. Typical Transfer Characteristics

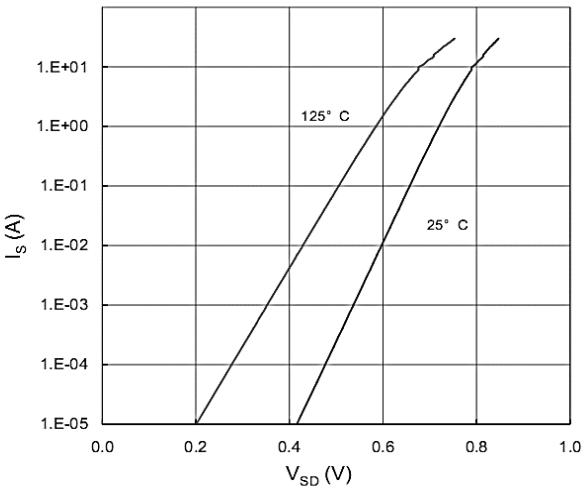


Figure 6. Typical Source-Drain Diode Forward Voltage

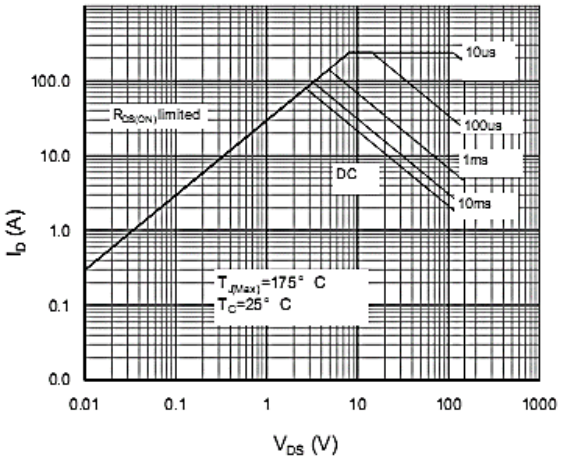


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

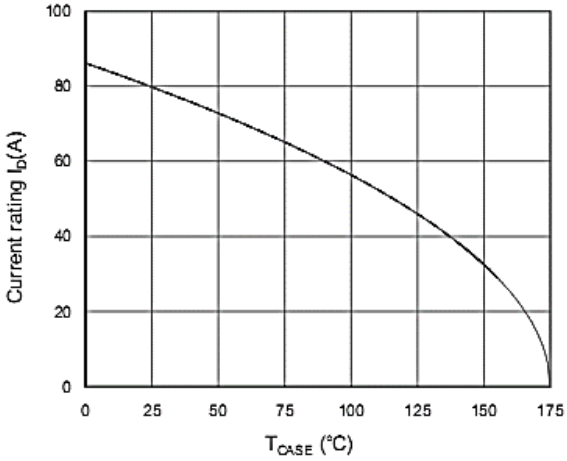


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

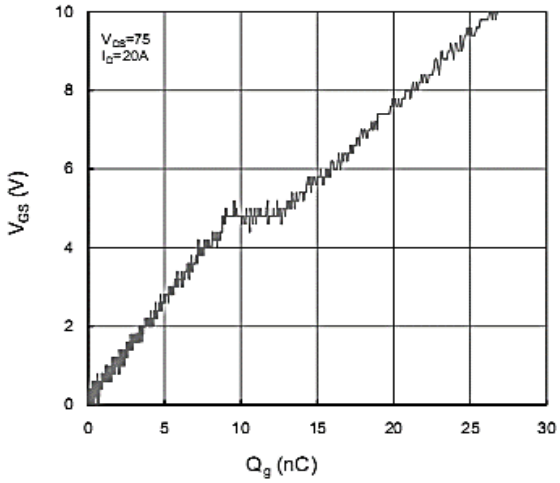


Figure 9. Maximum Safe Operating Area

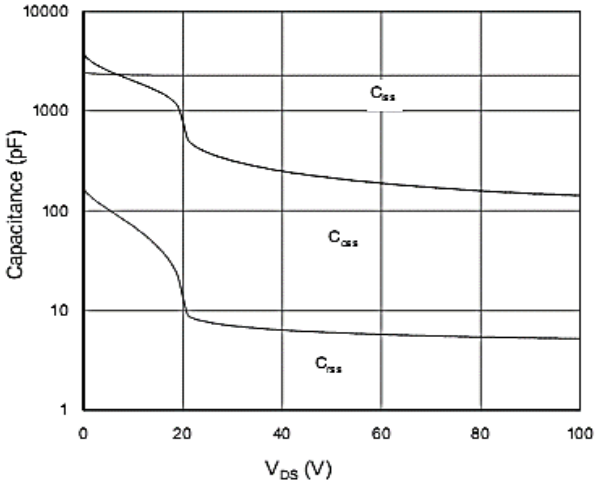


Figure 10. Maximun Drain Current vs. Case Temperature

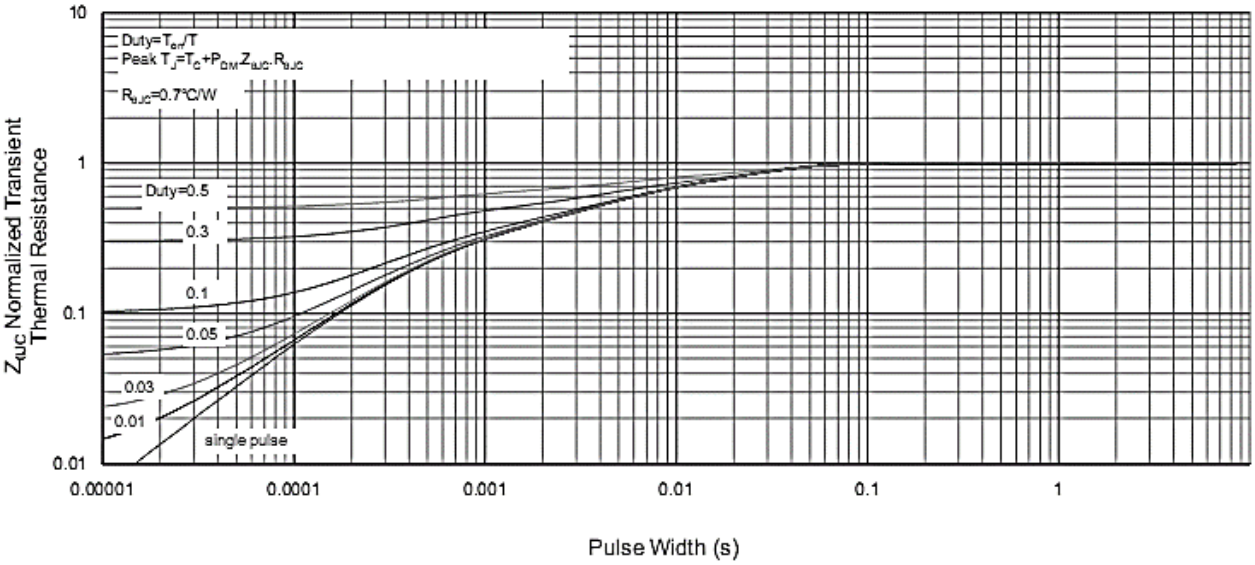
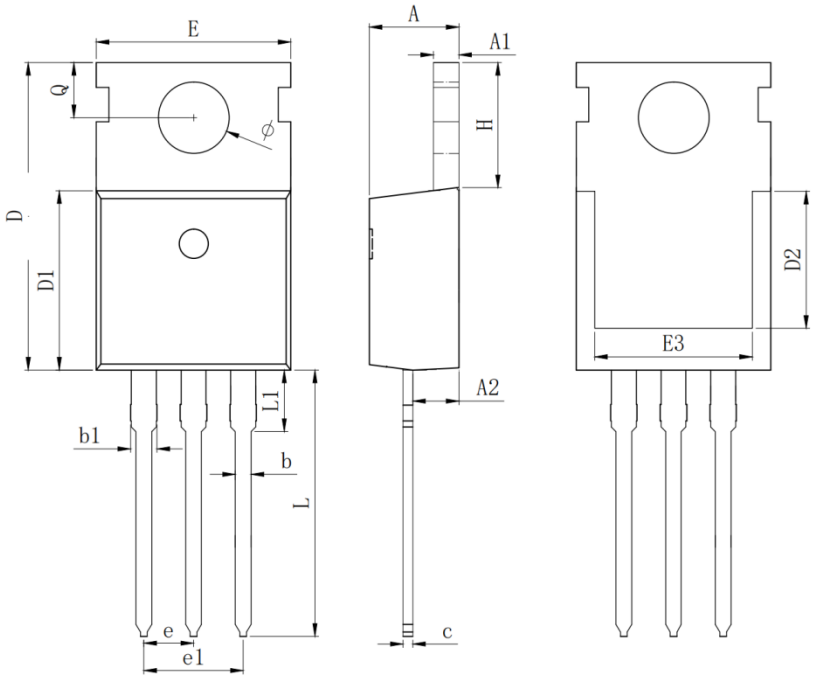


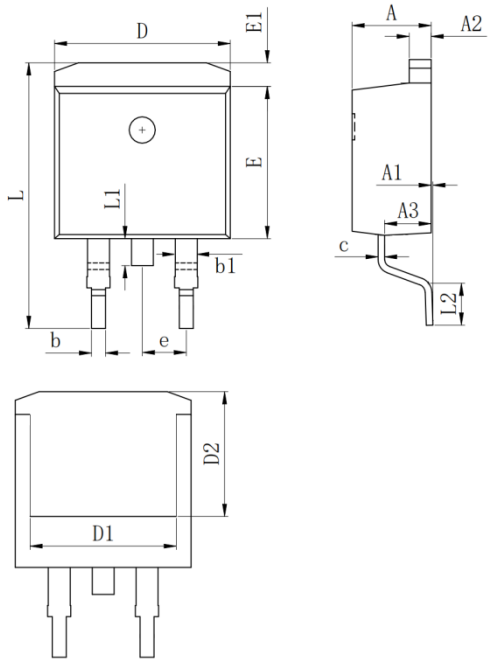
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data-TO220-3L



Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	4.25	4.50	4.70
A1	1.15	1.30	1.45
A2	2.15	2.35	2.55
b	0.65	0.80	0.95
b1	1.15	1.35	1.55
c	0.35	0.50	0.65
D	14.30	15.30	16.30
D1	8.80	9.10	9.40
D2	6.3REF		
E	9.70	10.00	10.30
E3	7.00	8.00	9.0
e	2.54BSC		
e1	5.08BSC		
L	12.70	13.50	13.90
L1	2.60	3.10	3.40
H	6.00	6.50	6.85
Q	2.60	2.80	3.00
ϕ	3.40	3.60	3.80

Package Mechanical Data-TO263-3L



Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	4.37	4.57	4.77
A1	0.00		0.25
A2	1.22	1.27	1.42
A3	2.49	2.69	2.89
b	0.70	0.81	0.96
b1	1.17	1.27	1.47
c	0.30	0.38	0.53
D	9.86	10.16	10.40
D1	8.4REF		
D2	7.073REF		
E	8.50	8.70	9.30
E1	0.87	1.17	1.47
e	2.54BSC		
L	14.70	15.10	15.50
L1	1.40	1.55	1.70
L2	2.00	2.30	2.60

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Edition	Date	Change
REV1.0	2022/10/29	Initial release
REV1.1	2025/01/21	Update LOGO And POD

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