

800V N-Channel Enhancement Mode MOSFET

Description

The AP4N80D/Y is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

General Features

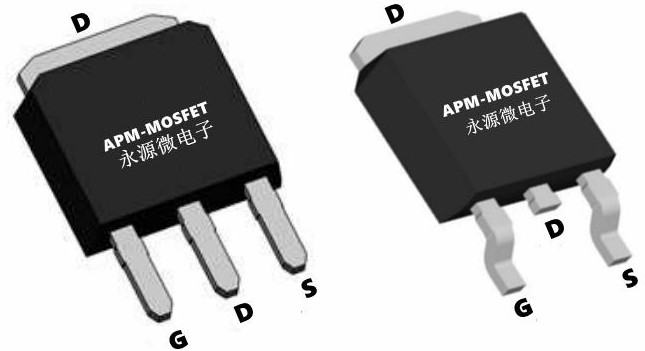
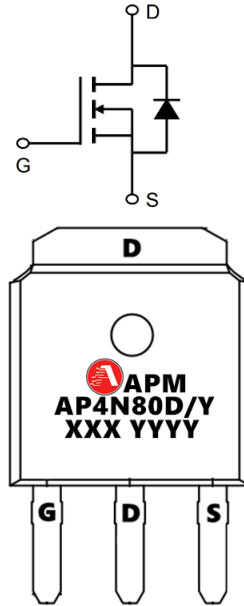
$V_{DS} = 800V$ $I_D = 4A$

$R_{DS(ON)} < 2.8\Omega$ @ $V_{GS}=10V$ (Type: 2.5 Ω)

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP4N80D	TO-252-3L	AP4N80D XXX YYYY	2500
AP4N80Y	TO-251S-3L	AP4N80Y XXX YYYY	4000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	800	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_c=25^\circ C$	Drain Current, V_{GS} @ 10V	4	A
I_{DM}	Pulsed Drain Current ¹	16	A
$P_D@T_c=25^\circ C$	Total Power Dissipation	106	W
E_{AS}	Single Pulse Avalanche Energy ⁴	240	mJ
TSTG	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
R_{thj-c}	Maximum Thermal Resistance, Junction-case	1.18	$^\circ C/W$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient	62.5	$^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
BVDSS	Drain-source Breakdown Voltage	VGS=0V, ID=250UA	800	870		V
VGS(TH)	Gate Threshold Voltage	VGS=VDS, ID=250uA	3.0	4.0	5.0	V
IDSS	Drain-source Leakage Current	VDS=800V, VGS=0V, Tj=25°C			1	uA
		VDS=640V, VGS=0V, Tj=125°C			10	uA
gfs	Forward Transconductance	VDS=15V, ID=2.0A		2.5		S
IGSS	Gate-body Leakage Current	VGS =±30V			±100	nA
RDS(ON)	Static Drain-source On Resistance	VGS=10V, ID=2.0A		2.5	2.8	Ω
Ciss	Input Capacitance	VGS=0V, VDS=25V F=1.0MHZ		700		pF
Coss	Output Capacitance			58		pF
Crss	Reverse transfer Capacitance			5		pF
Td(on)	Turn-on Delay Time	VDD=400V, ID =4.0A RG=25Ω		16		ns
Tr	Rise Time			14		ns
Td(off)	Turn -Off Delay Time			40		ns
Tf	Fall Time			12		ns
Qg	Total Gate Charge	ID=4.0A, VDS=640V VGS=10V		17.4		nC
Qgs	Gate-to-Source Charge			4.8		nC
Qgd	Gate-to-Drain Charge			5.4		nC
IS	Continuous Diode Forward Current				4.0	A
VSD	Diode Forward Voltage	Tj=25°C, Is=4.0A VGS =0V			1.4	V
trr	Reverse Recovery Time	Tj=25°C, If=4.0A di/dt=100A/μs		250		ns
Qrr	Reverse Recovery Charge			1.5		uC

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The EAS data shows Max. rating . IAS = 4.5A, VDD = 50V, RG = 25 Ω, Starting TJ = 25 °C
- 3、The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

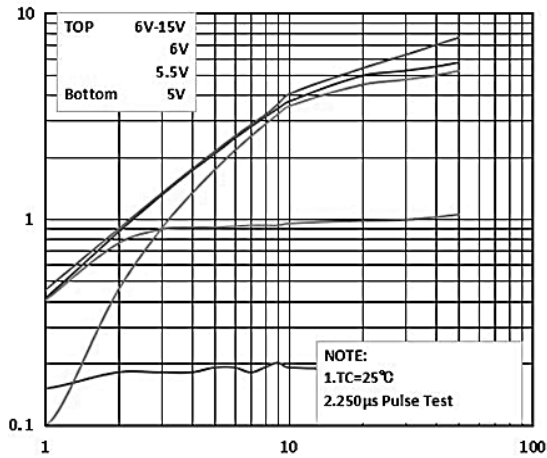


Figure 1. Output Characteristics

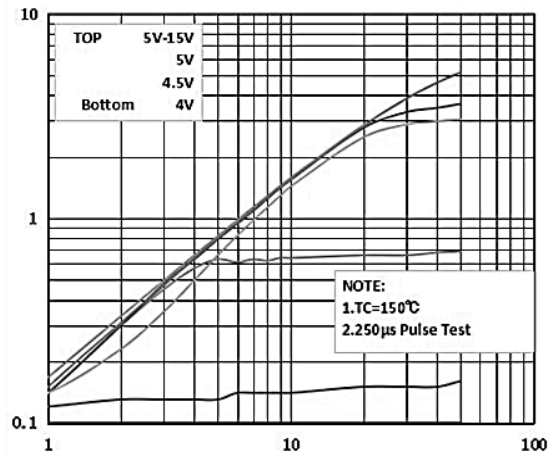


Figure 2. Body Diode Forward Voltage

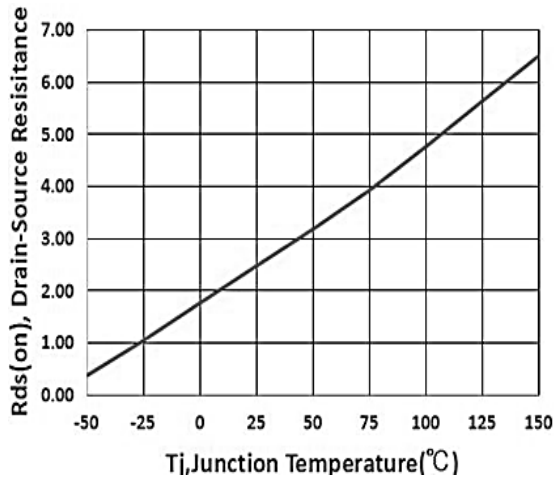


Figure3. Drain Current vs. Temperature

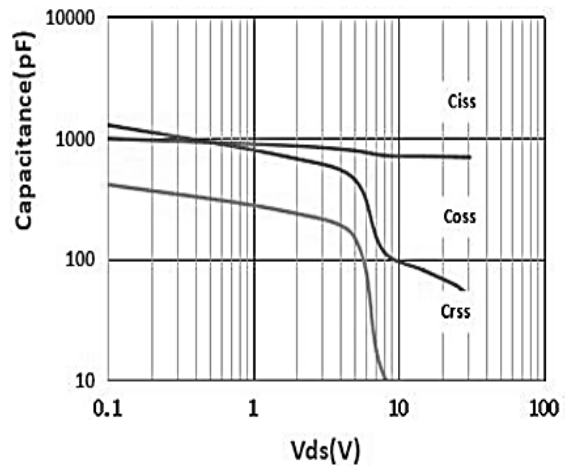


Figure4. BVDSS Variation vs. Temperature

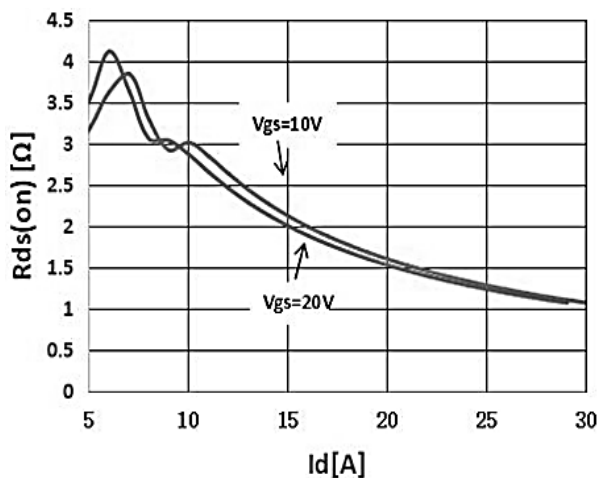


Figure 5. Transfer Characteristics

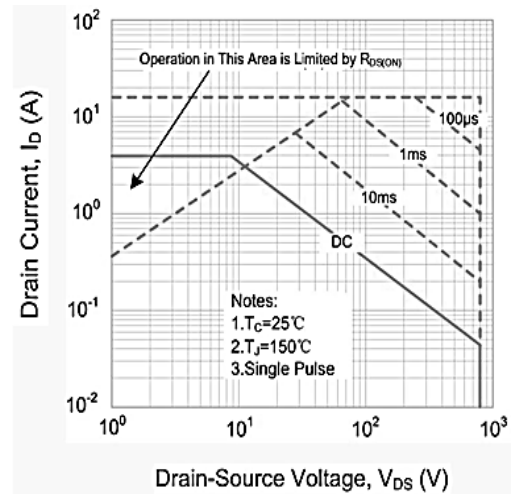
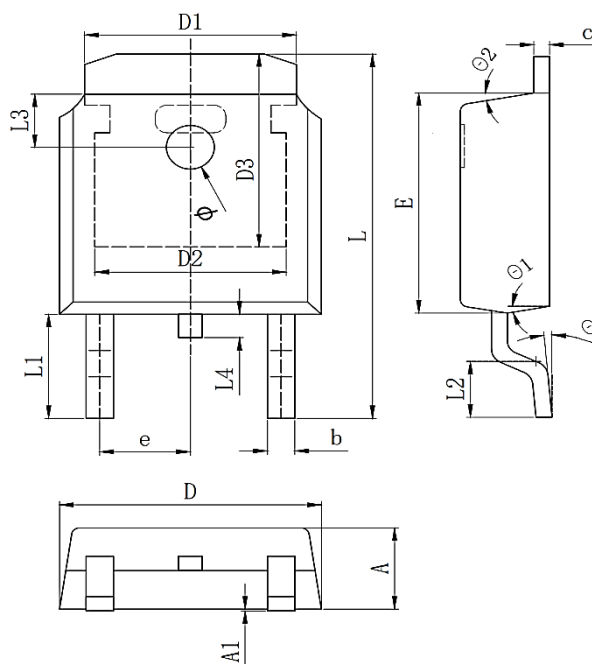


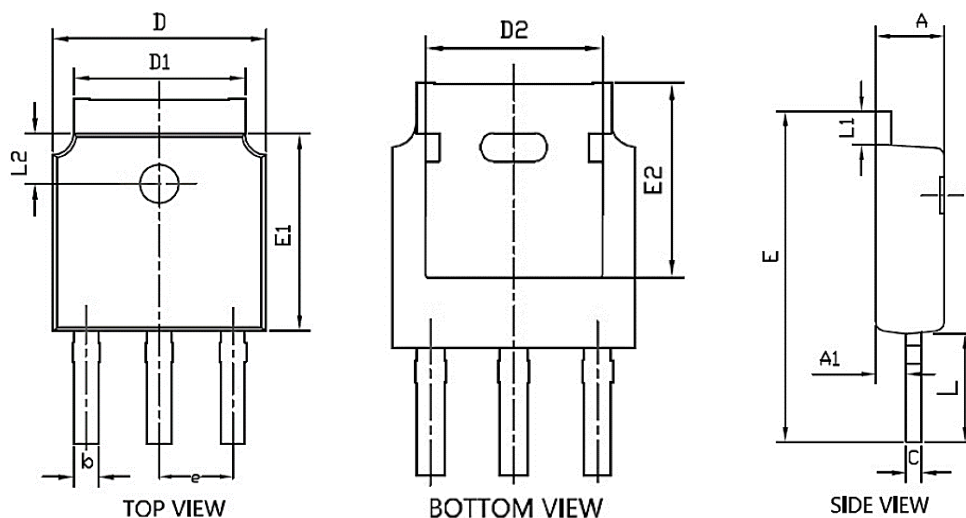
Figure 6. On-Resistance vs. Temperature

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°

Package Mechanical Data-TO-251S-3L



Symbol	Dim in mm		
	Mim	Nom	Max
A	2.2	2.3	2.4
A1	0.9	1.0	1.1
b	0.66	0.76	0.86
C	0.46	0.52	0.58
D	6.50	6.6	6.7
D1	5.15	5.3	5.45
D2	4.6	4.8	4.95
E	10.4	---	11.5
E1	6.0	6.1	6.2
E2	5.400REF		
e	2.286BSC		
L	3.5	4.0	4.3
L1	0.9	---	1.27
L2	1.4	---	1.9

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Edition	Date	Change
REV1.0	2023/6/31	Initial release

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