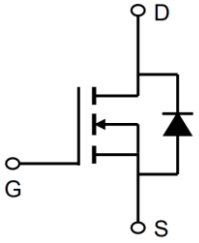
AP80N03D

30V N-Channel Enhancement Mode MOSFET



Description

The AP80N03D 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} = 30V I_D =80 A

$R_{DS(ON)}$ < 6mΩ @ V_{GS}=10V

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP80N03D	TO-252-3L	AP80N03D XXX YYYY	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25°C)	80	A
	Drain Current – Continuous (T_C=100°C)	51	A
I_{DM}	Drain Current – Pulsed[1]	320	A
EAS	Single Pulse Avalanche Energy[2]	88	mJ
IAS	Single Pulse Avalanche Current[2]	42	A
P_D	Power Dissipation (T_C=25°C)	54	W
	Power Dissipation – Derate above 25°C	0.43	W/°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction to ambient	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	2.3	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25°C , I_D=1mA	---	0.04	---	V/°C
IDSS	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=125°C	---	---	10	uA
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
RDS(ON)	Static Drain-Source On-Resistance[3]	V_{GS}=10V , I_D=20A	---	4.8	6	mΩ
		V_{GS}=4.5V , I_D=10A	---	6.5	9	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1	1.6	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	mV/°C
gfs	Forward Transconductance	V_{DS}=10V , I_D=10A	---	18	---	S
Q_g	Total Gate Charge[3,4]	V_{DS}=15V , V_{GS}=4.5V , I_D=20A	---	11.1	---	nC
Qgs	Gate-Source Charge[3,4]		---	1.85	---	
Qgd	Gate-Drain Charge[3,4]		---	6.8	---	
Td(on)	Turn-On Delay Time[3,4]	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	7.5	---	ns
T_r	Rise Time[3,4]		---	14.5	---	
Td(off)	Turn-Off Delay Time[3,4]		---	35.2	---	
T_f	Fall Time[3,4]		---	9.6	---	
Ciss	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	1160	---	pF
Coss	Output Capacitance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	200	---	Ω
Crss	Reverse Transfer Capacitance		---	180	---	
R_g	Gate resistance		---	2.5	---	
EAS	Single Pulse Avalanche Energy	V_{DD}=25V, L=0.1mH, IAS=20A	20	---	---	mJ
IS	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	80	A
ISM	Pulsed Source Current[3]		---	---	320	A
VSD	Diode Forward Voltage[3]	V_{GS}=0V , I_S=1A , T_J=25°C	---	---	1	V
trr	Reverse Recovery Time	VGS=0V,IS=1A , di/dt=100A/μs T_J=25°C	---	---	---	ns
Q_{rr}	Reverse Recovery Charge		---	---	---	nC

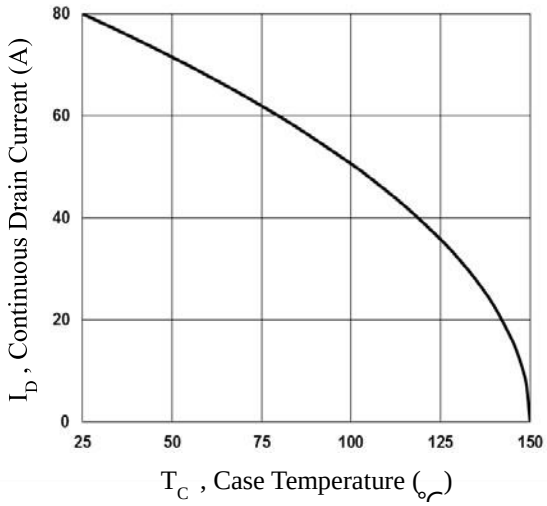


Fig.1 Continuous Drain Current vs. Tc

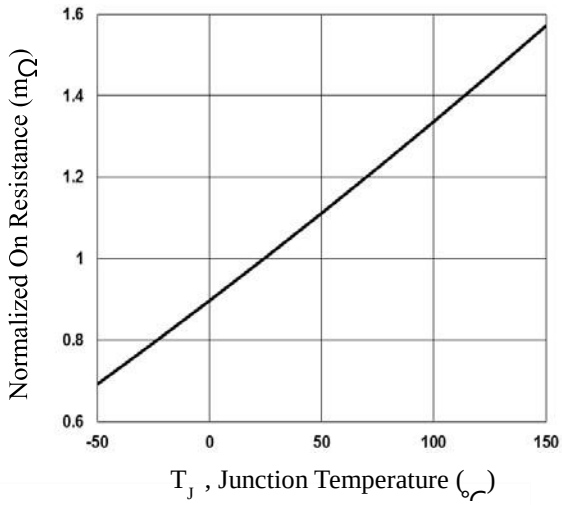


Fig.2 Normalized RDSON vs. Tj

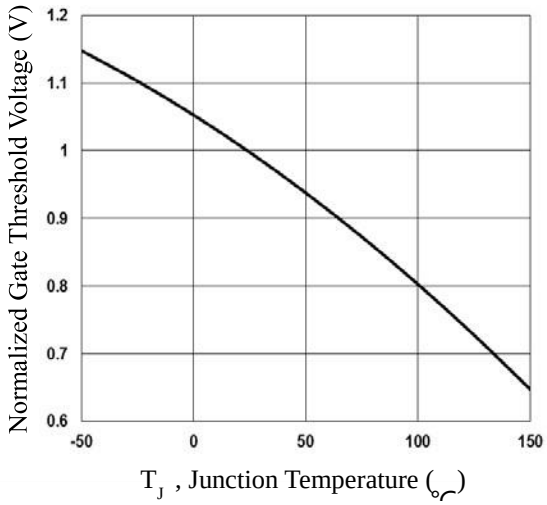


Fig. 3 Normalized Vth vs. Tj_J

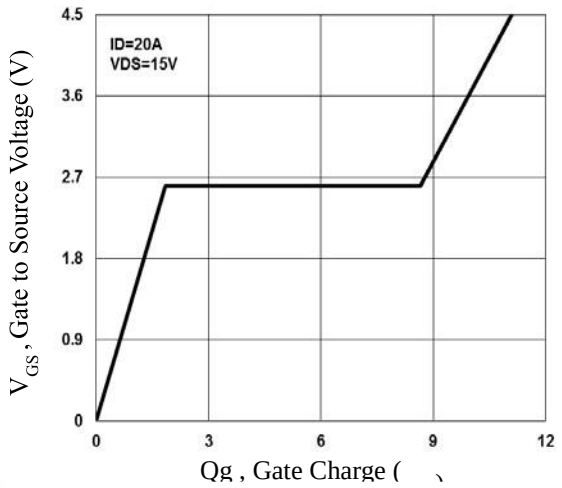


Fig. 4 Gate Charge Waveform

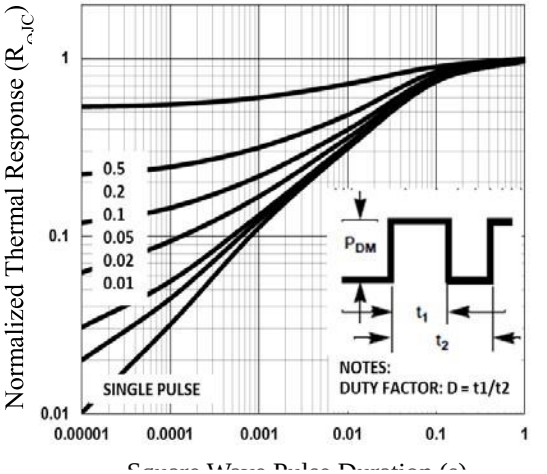


Fig.5 Normalized Transient Impedance

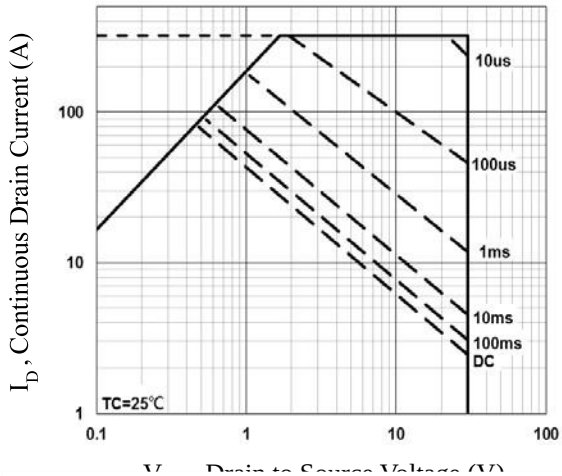


Fig.6 Maximum Safe Operation Area

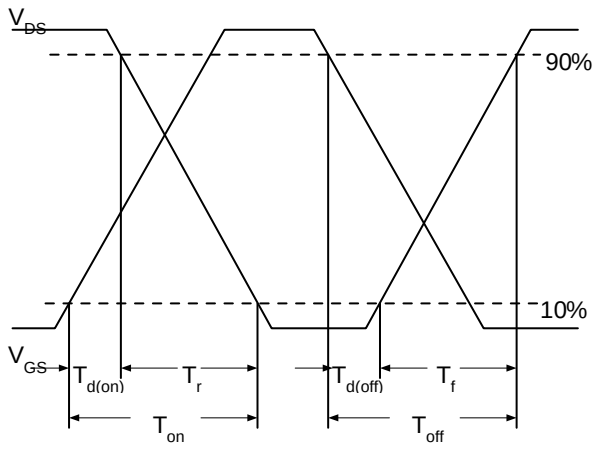


Fig. 7 Switching Time Waveform

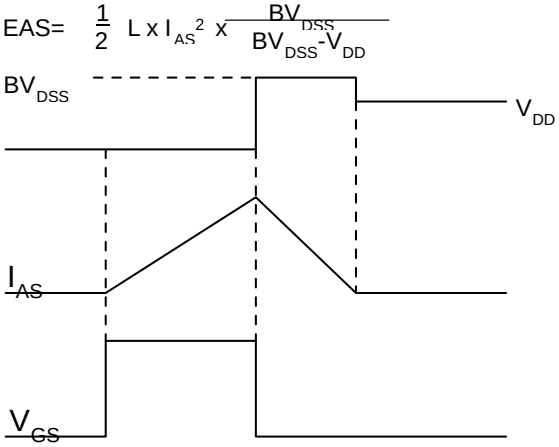
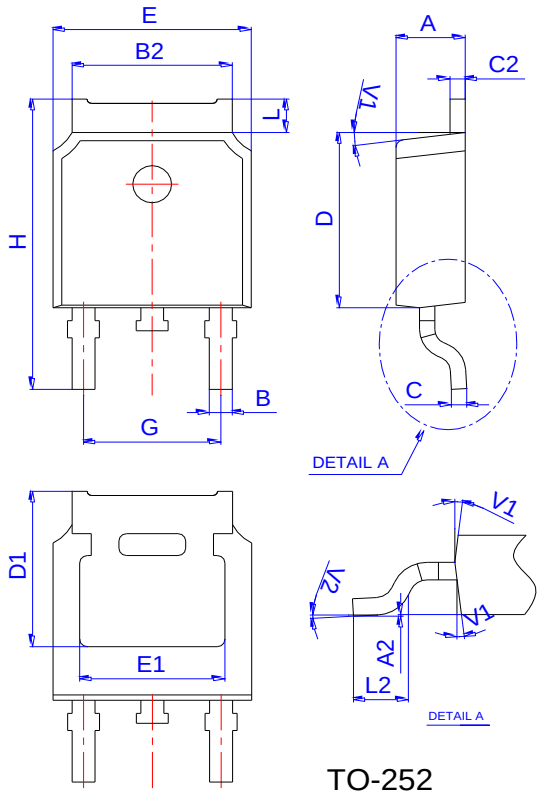


Fig. 8 EAS Wavefo rm

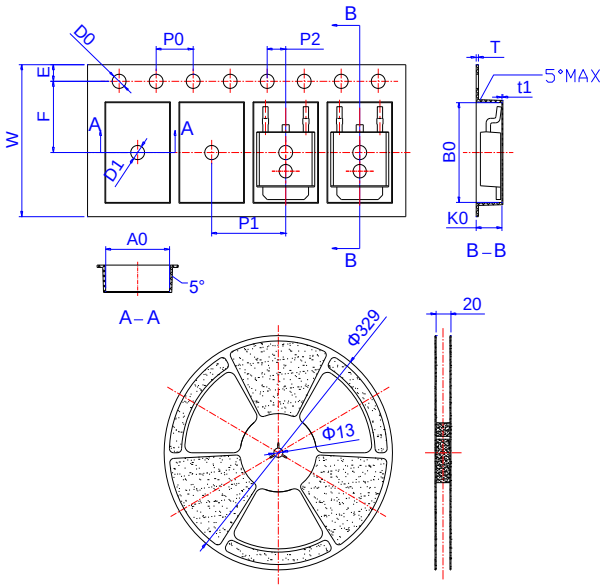
Package Mechanical Data



TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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