

V_{DSS}	30V
$R_{DS(on)}(Max.)$	3.8m Ω
I_D	80A
P_D	66W

Features

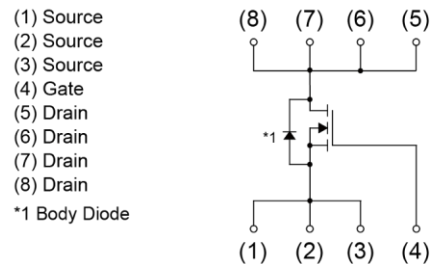
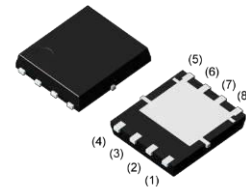
- 30V, 80A, $R_{DS(ON)} = 3.8m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

Outline

P PAK 3X3



Type	Packing	
	Reel size (mm)	330
	Tape width (mm)	12
	Basic ordering unit (pcs)	5000
	Taping code	D3
	Marking	AD30N80D3

Absolute Maximum Ratings $T_C=25^\circ C$ 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 ($T_C=25^\circ$)	80	A
	Drain Current – Continuous ($T_C=100^\circ$)	51	A
I_{DM}	Drain Current – Pulsed ¹	320	A
EAS	Single Pulse Avalanche Energy ²	125	mJ
IAS	Single Pulse Avalanche Current ²	50	A
P_D	Power Dissipation ($T_C=25^\circ$)	66	W
	Power Dissipation – Derate above 25 $^\circ$	0.53	W/ $^\circ$
T_{STG}	Storage Temperature Range	-55 to 175	
T_J	Operating Junction Temperature Range	-55 to 175	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	2	$^\circ W$

Electrical Characteristics (T_J=25 , unless otherwise noted)

Static State Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	30	---	---	V
BV _{DSS} T _J	BV _{DSS} Temperature Coefficient	Reference to 25 , I _D =1mA	---	0.03	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V , V _{GS} =0V , T _J =25.	---	---	1	uA
		V _{DS} =24V , V _{GS} =0V , T _J =125.	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =20V , V _{DS} =0V	---	---	100	nA
R _{DS(ON)}	Static Drain-Source On-Resistance ³	V _{GS} =10V , I _D =24A	---	2.9	3.8	mΩ
		V _{GS} =4.5V , I _D =12A	---	4.3	5.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.6	2.5	V
V _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =10A	---	28	---	S

Dynamic Characteristics

Q _g	Total Gate Charge ^{3, 4}	V _{DS} =15V , V _{GS} =4.5V , I _D =24A	---	24	34	nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	4.2	6	
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	13	18	
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =15V , V _{GS} =10V , R _G =3.3Ω I _D =15A	---	12.6	24	ns
T _r	Rise Time ^{3, 4}		---	19.5	37	
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	42.8	81	
T _f	Fall Time ^{3, 4}		---	13.2	25	
C _{iss}	Input Capacitance	V _{DS} =25V , V _{GS} =0V , F=1MHz	---	2200	3190	pF
C _{oss}	Output Capacitance		---	280	405	
C _{rss}	Reverse Transfer Capacitance		---	177	255	
R _g	Gate resistance	V _{GS} =0V , V _{DS} =0V , F=1MHz	---	2	4	Ω

Guaranteed Avalanche Energy

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy	V _{DD} =25V , L=0.1mH , I _{AS} =24A	31	---	---	mJ

Drain-Source Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	80	A
I _{SM}	Pulsed Source Current ³		---	---	320	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V , I _S =1A , T _J =25.	---	---	1	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V , I _S =1A , di/dt=100A/μs	---	---	---	ns
Q _{rr}	Reverse Recovery Charge	T _J =25.	---	---	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V , V_{GS}=10V , L=0.1mH , I_{AS}=50A , R_G=25Ω Starting T_J=25.
3. The data tested by pulsed , pulse width . 300us , duty cycle . 2%.
4. Essentially independent of operating temperature.

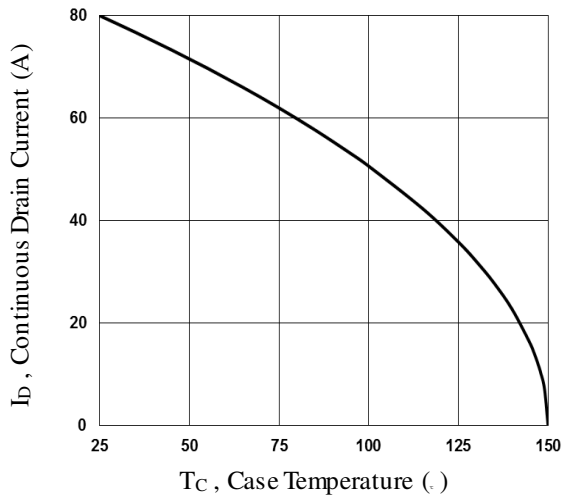


Fig.1 Continuous Drain Current vs. T_C

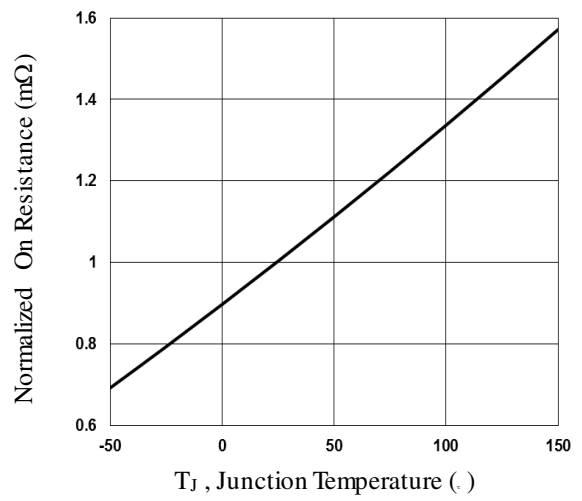


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

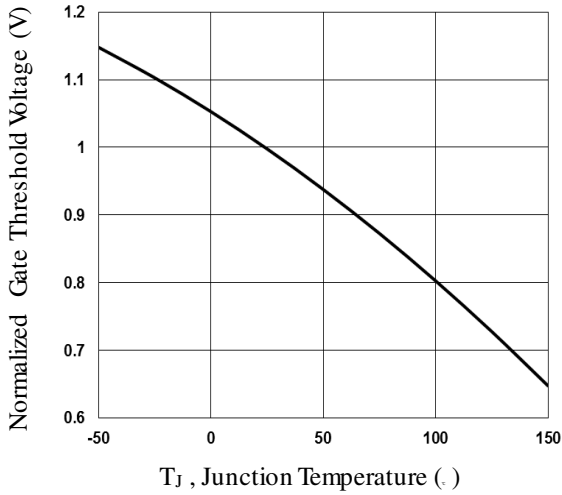


Fig.3 Normalized V_{th} vs. T_J

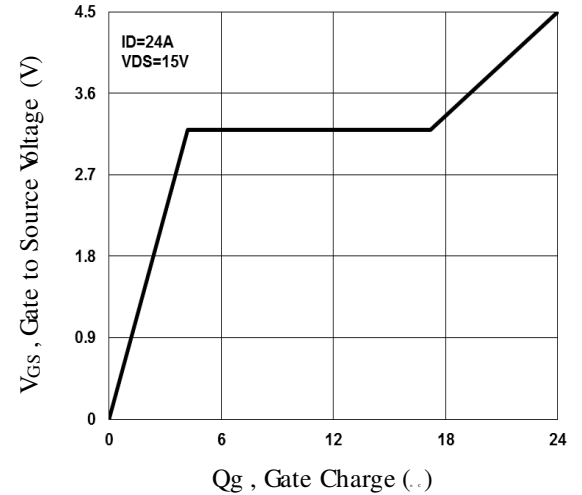


Fig.4 Gate Charge Waveform

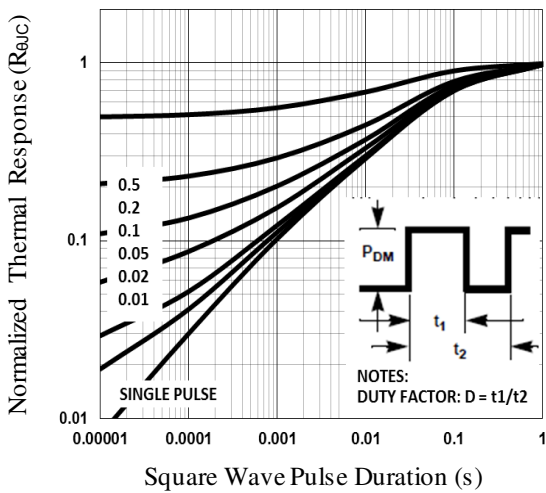


Fig.5 Normalized Transient Impedance

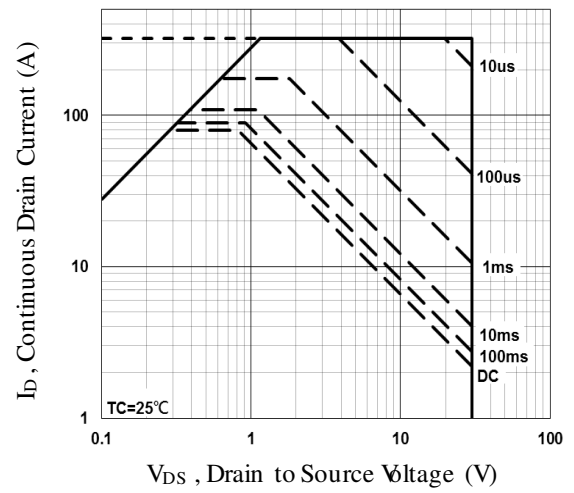


Fig.6 Maximum Safe Operation Area

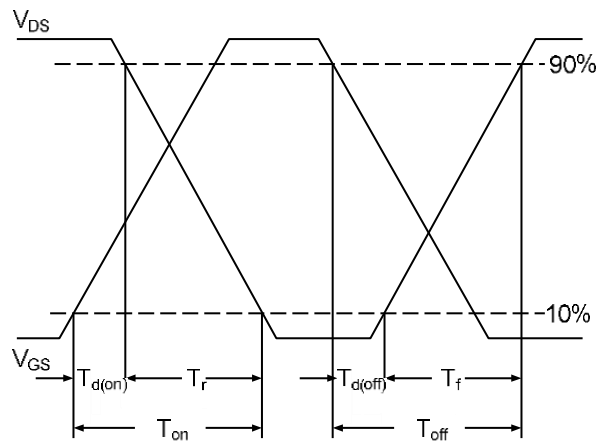


Fig.7 Switching Time Waveform

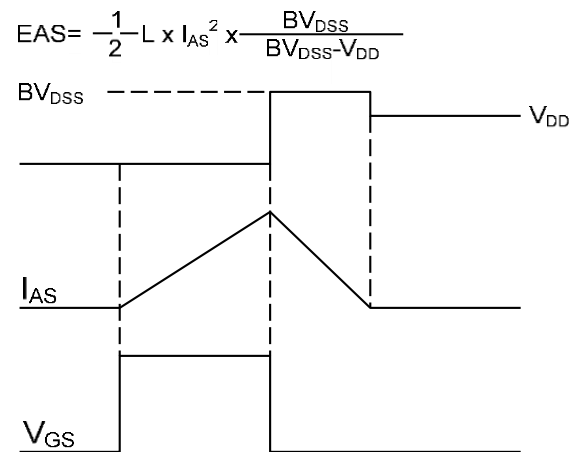
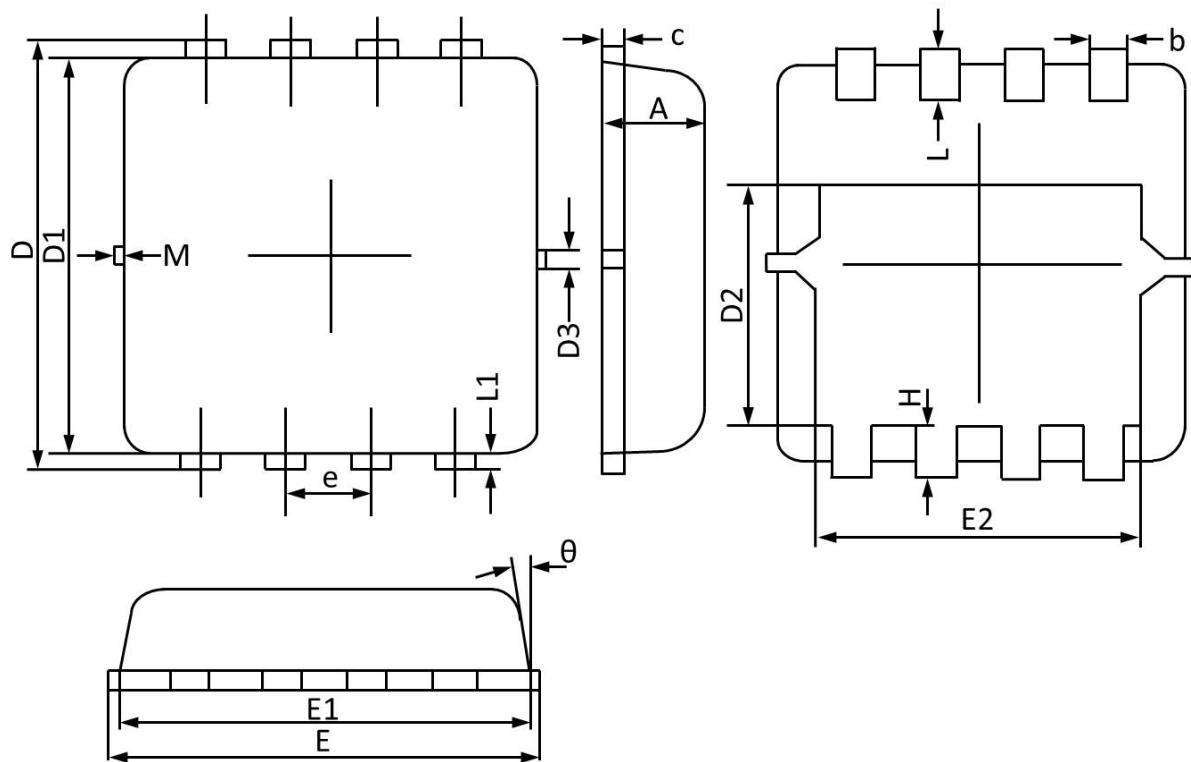


Fig.8 EAS Waveform

PPAK3x3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	