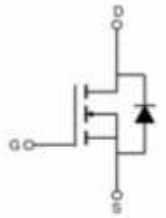
AP20N100Q

N-Channel Enhancement Mosfet

ALLPOWER
DATA SHEET

Feature

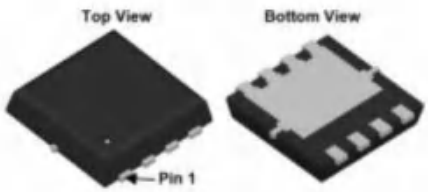
- 100V,16A
  $R_{DS(ON)}$ <38mΩ @V_{GS}=10V TYP: 32 mΩ
  $R_{DS(ON)}$ <63mΩ @V_{GS}=4.5V TYP: 49 mΩ
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic Diagram

Application

- PWM applications
- Load Switch
- Power management



PDFN3X3

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
20N100Q	AP20N100Q	PDFN3X3	13 inch	-	5000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Continuous Drain Current (T_a =25℃)	I_D	16	A
Continuous Drain Current (T_a =100℃)	I_D	10	A
Pulsed Drain Currenr (1)	I_{DM}	64	A
Singel Pulsed Avalanche Energy (2)	E_{AS}	34	mJ
Power Dissipation	P_D	32.5	W
Thermal Resistance from Junction to Case(4)	$R_{\theta JC}$	3.5	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	100	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =20V,V_{DS} = 0V	-	-	100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.6	2.5	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =10A	-	32	38	mΩ
		V_{GS} =4.5V, I_D =8A	-	49	63	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =20V, V_{GS} =0V, f =1MHz	-	553	-	pF
Output Capacitance	C_{oss}		-	181	-	
Reverse Transfer Capacitance	C_{rss}		-	30	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, I_D=1A, V_{GS}=10V, R_G=3Ω	-	7.4	-	ns
Turn-on rise time	t_r		-	12	-	
Turn-off delay time	$t_{d(off)}$		-	23	-	
Turn-off fall time	t_f		-	16	-	
Total Gate Charge	Qg	VDS=50V, ID=10A, VGS=10V	-	8	-	nC
Gate-Source Charge	Qgs		-	2.1	-	
Gate-Drain Charge	Qgd		-	2.3	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=1A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	16	A
Reverse Recovery Time	Trr	V_{GS} =0V, I_S=10A,di/dt=100A/μS	-	30	-	ns
Reverse Recovery Char	Qrr	T_J=25℃	-	24	-	nC

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=50V,R_G=25Ω,L=0.1mH,I_{AS}=26A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

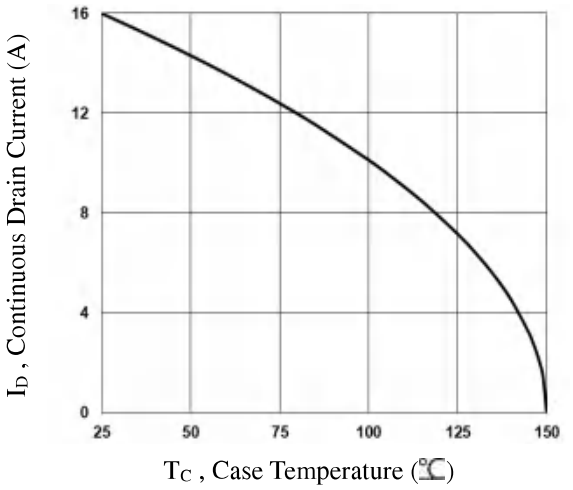


Fig.1 Continuous Drain Current vs. T_C

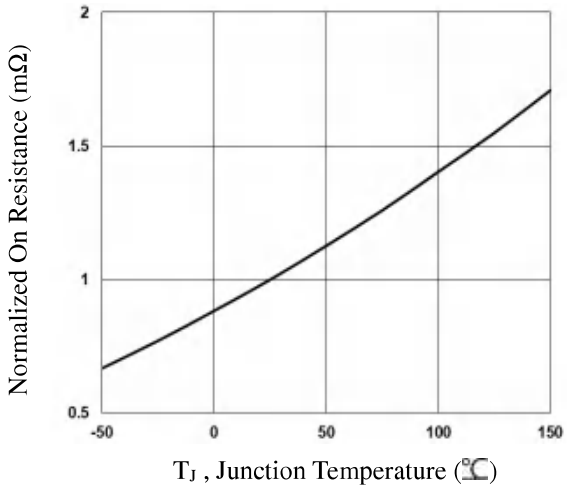


Fig.2 Normalized RDSON vs. T_J

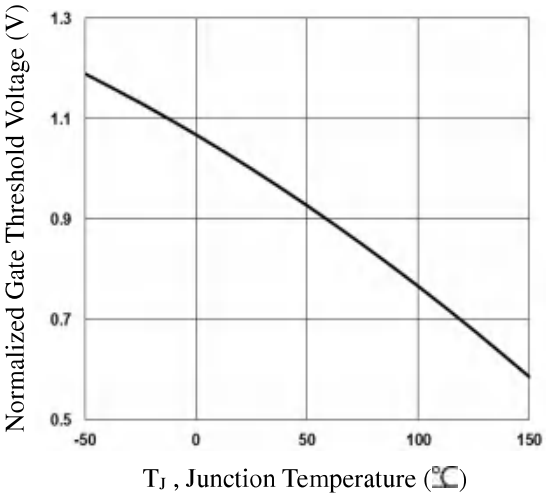


Fig.3 Normalized V_{th} vs. T_J

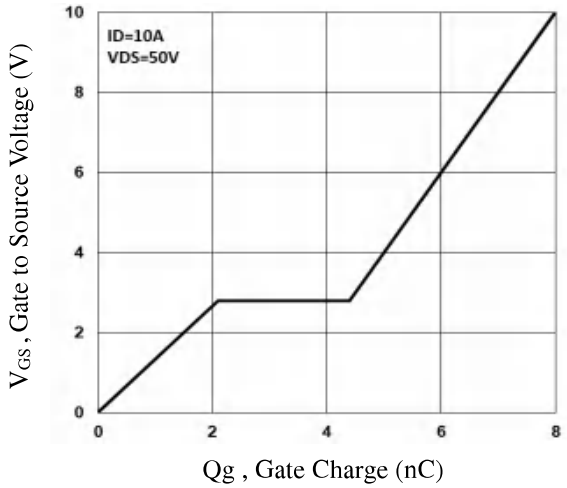


Fig.4 Gate Charge Waveform

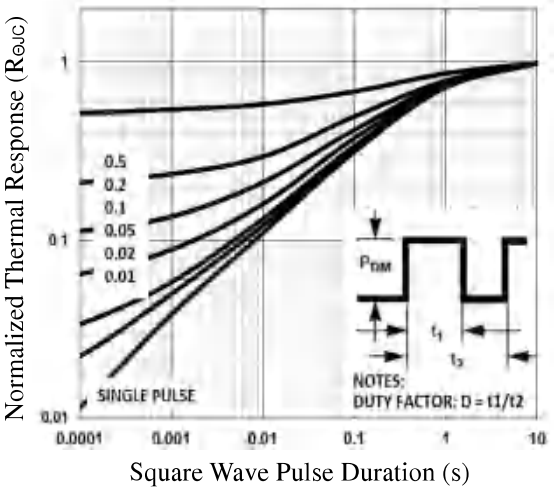


Fig.5 Normalized Transient Response

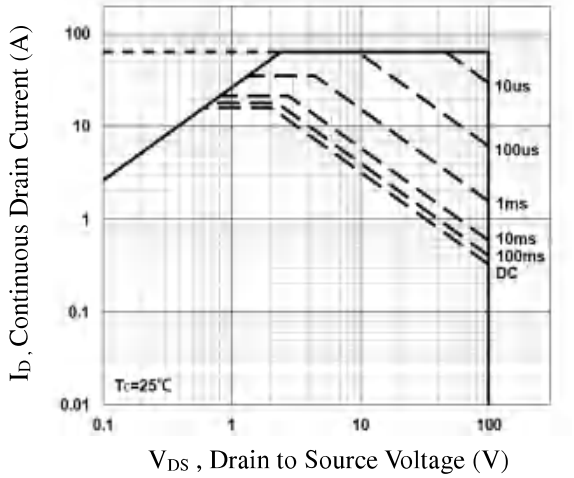


Fig.6 Maximum Safe Operation Area

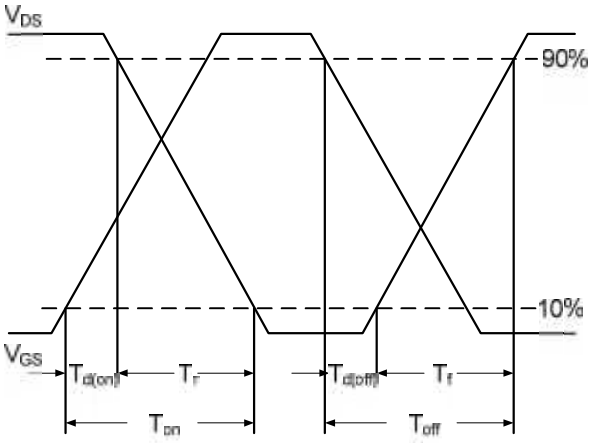


Fig.7 Switching Time Waveform

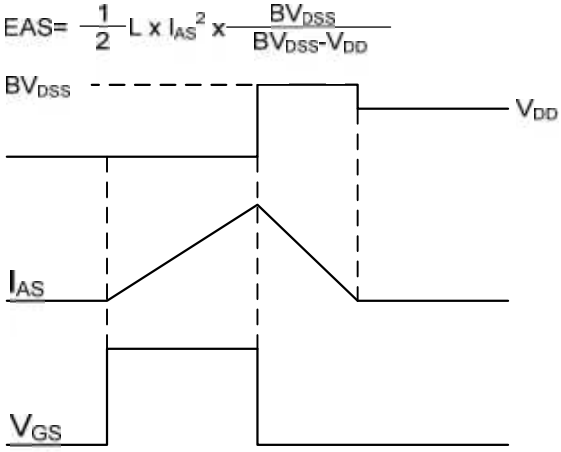
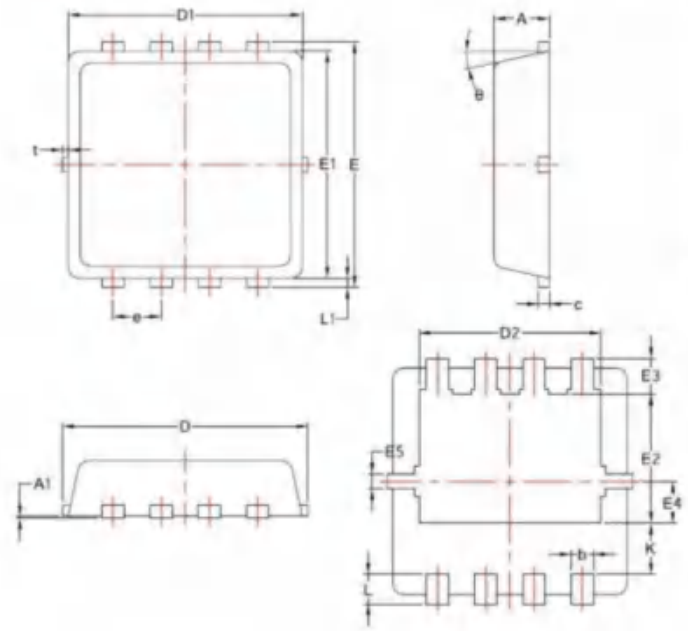


Fig.8 EAS Waveform

PDFN3X3 Package Information



SYMBOL	COMMON		
	MM		
	MIN	NOM	MAX
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
θ	10°	12°	14°