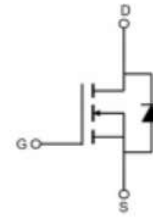


## Feature

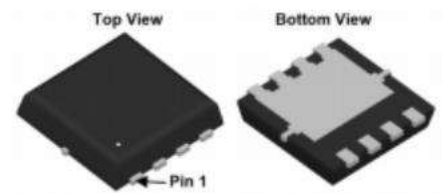
- 100V,16A  
 $R_{DS(ON)} < 38m\Omega @ V_{GS}=10V$  TYP: 32 m $\Omega$   
 $R_{DS(ON)} < 63m\Omega @ V_{GS}=4.5V$  TYP: 49 m $\Omega$
- Advanced Trench Technology
- Lead free product is acquired
- Excellent  $R_{DS(ON)}$  and Low Gate Charge



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 ( $T_a=25^\circ\text{C}$ unless otherwise noted)

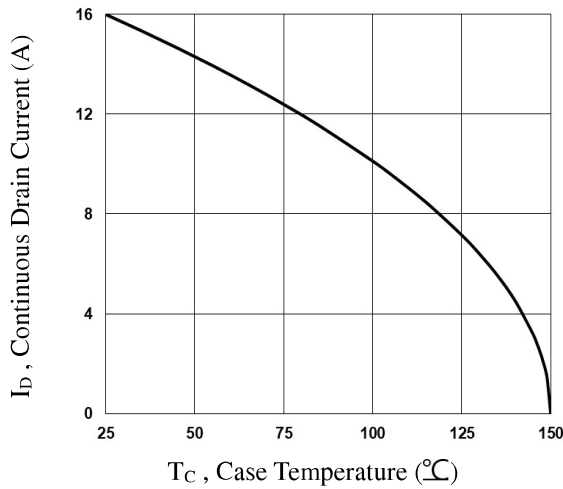
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	+20/-12	V
Continuous Drain Current ( $T_a=25^\circ\text{C}$ )	$I_D$	16	A
Continuous Drain Current ( $T_a=100^\circ\text{C}$ )	$I_D$	10	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	64	A
Singel Pulsed Avalanche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

### MOSFET ELECTRICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

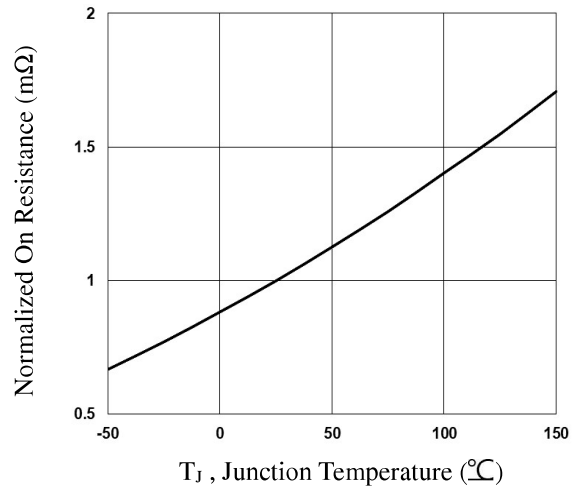
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = 20V, V_{DS} = 0V$	-	-	100	nA
Gate threshold voltage <sup>(3)</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.6	2.5	V
Drain-source on-resistance <sup>(3)</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$	-	32	38	m $\Omega$
		$V_{GS} = 4.5V, I_D = 8A$	-	49	63	
<b>Dynamic characteristics</b>						
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	-	
<b>Switching characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 50V, I_D = 1A,$ $V_{GS} = 10V, R_G = 3\Omega$	-	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	$Q_g$	$V_{DS} = 50V, I_D = 10A,$ $V_{GS} = 10V$	-	8	-	nC
Gate-Source Charge	$Q_{gs}$		-	2.1	-	
Gate-Drain Charge	$Q_{gd}$		-	2.3	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(3)</sup>	$V_{DS}$	$V_{GS} = 0V, I_S = 1A$	-	-	1.2	V
Diode Forward current <sup>(4)</sup>	$I_S$		-	-	16	A
Reverse Recovery Time	$T_{rr}$	$V_{GS} = 0V, I_S = 10A, di/dt = 100A/\mu S$	-	30	-	ns
Reverse Recovery Char	$Q_{rr}$	$T_J = 25^{\circ}\text{C}$	-	24	-	nC

#### Notes:

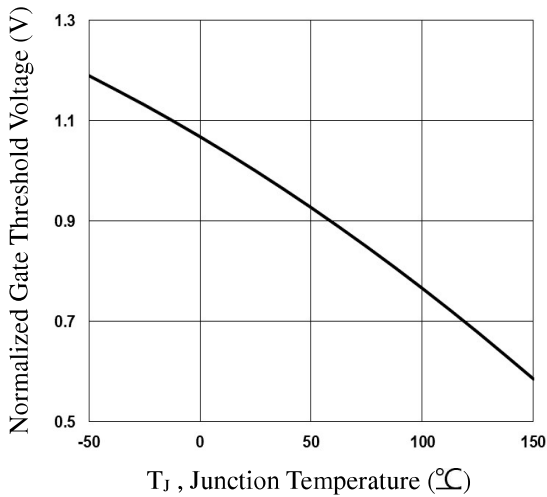
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:  $T_J = 25^{\circ}\text{C}, V_{DD} = 50V, R_G = 25\Omega, L = 0.1mH, I_{AS} = 26A$
3. Pulse Test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
4. Surface Mounted on FR4 Board,  $t \leq 10$  sec



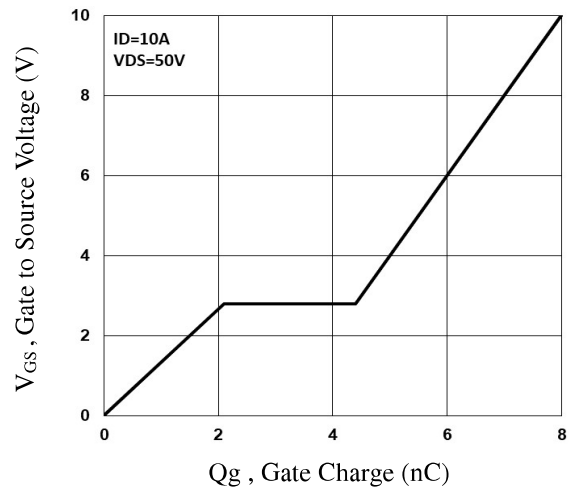
**Fig.1 Continuous Drain Current vs.  $T_c$**



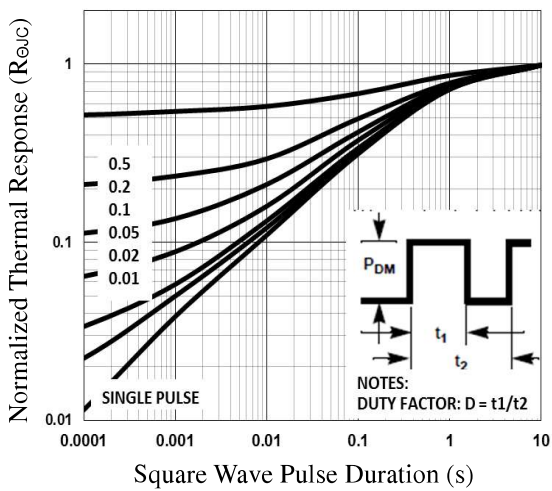
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



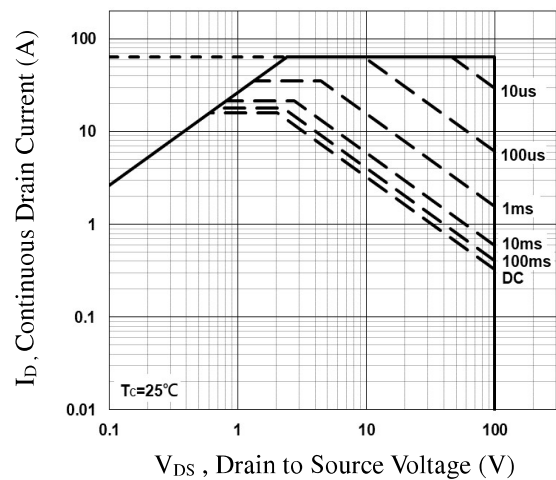
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



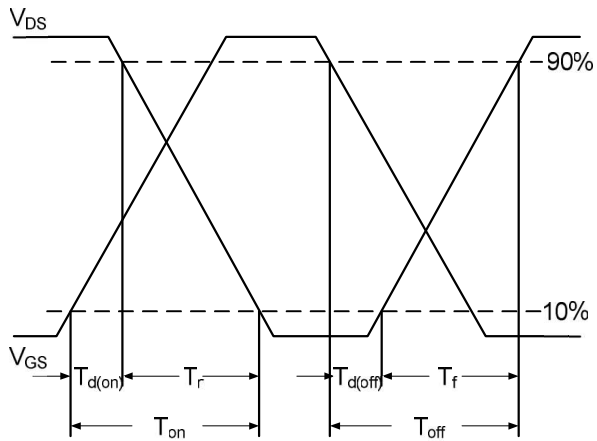
**Fig.4 Gate Charge Waveform**



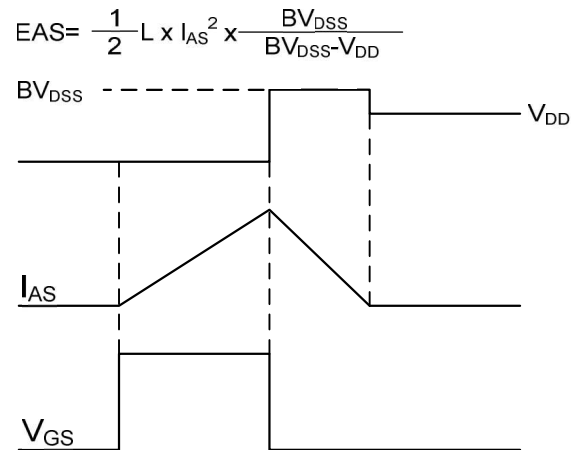
**Fig.5 Normalized Transient Response**



**Fig.6 Maximum Safe Operation Area**



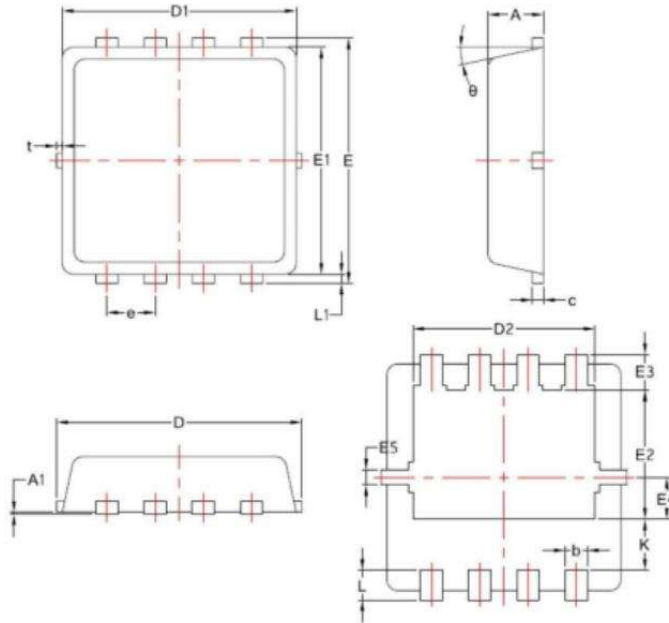
**Fig.7 Switching Time Waveform**



**Fig.8 EAS Waveform**

**AP20N100Q**  
N-Channel Enhancement Mosfet

**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°