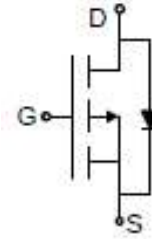


AP50P20Q

P-Channel Power MOSFET

Features

- $V_{DS} = -20V$, $I_D = -50A$
 $R_{DS(ON)} < 8.5m\Omega$ @ $V_{GS} = -4.5V$
 $R_{DS(ON)} < 12m\Omega$ @ $V_{GS} = -2.5V$
- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package

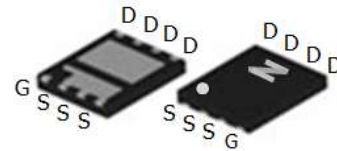


Schematic Diagram

Application

- PWM Applications
- Load Switch

Package



DFN3 x 3

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	-50
		$T_C = 100^\circ C$	-32
I_{DM}	Pulsed Drain Current <small>note1</small>	-200	A
P_D	Power Dissipation	$T_C = 25^\circ C$	40
$R_{\theta JC}$	Thermal Resistance, Junction to Ambient	3.0	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175	$^\circ C$

AP50P20Q
P-Channel Power MOSFET
Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -20V, V_{GS} = 0V,$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 12V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.35	-0.65	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note2</small>	$V_{GS} = -4.5V, I_D = -15A$	-	6.6	8.5	m Ω
		$V_{GS} = -2.5V, I_D = -12A$	-	8	12	
g_{FS}	Forward Transconductance	$V_{DS} = -5V, I_D = -10A$	-	36	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1.0MHz$	-	4590	-	pF
C_{oss}	Output Capacitance		-	505	-	pF
C_{rss}	Reverse Transfer Capacitance		-	440	-	pF
Q_g	Total Gate Charge	$V_{DS} = -10V, I_D = -15A,$ $V_{GS} = -4.5V$	-	46	-	nC
Q_{gs}	Gate-Source Charge		-	7.3	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	10	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -10V, I_D = -14A,$ $R_{GEN} = 2.7\Omega,$ $V_{GS} = -10V$	-	8	-	ns
t_r	Turn-on Rise Time		-	59	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	111	-	ns
t_f	Turn-off Fall Time		-	43	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-50	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-200	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -20A$	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	$T_j = 25^{\circ}\text{C}, I_{SD} = -15A,$	-	18	-	ns
Q_{rr}	Reverse Recovery Charge	$V_{GS} = 0V$ $di/dt = -100A/\mu s$	-	7.7	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

AP50P20Q
P-Channel Power MOSFET

Typical Performance Characteristics

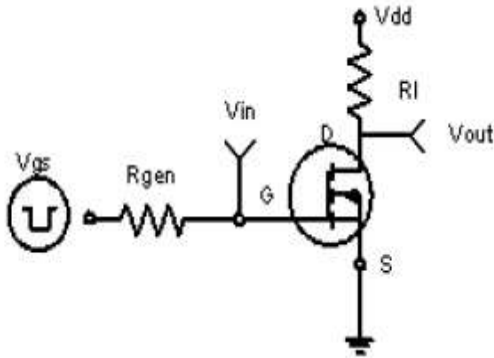


Figure1 :Switching Test Circuit

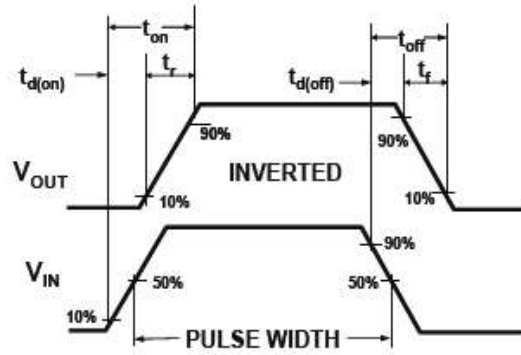
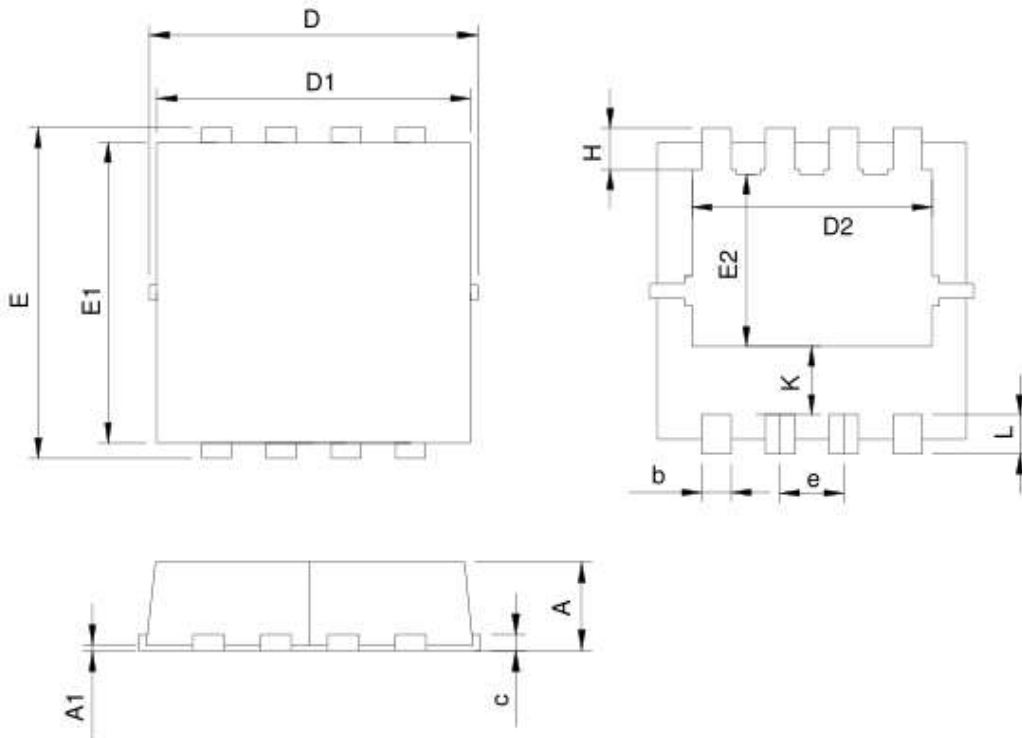


Figure2:Switching Waveforms

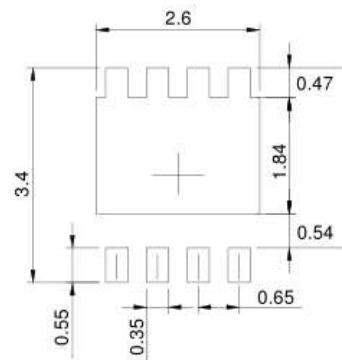
AP50P20Q
P-Channel Power MOSFET

•Dimensions(DFN3×3)



L C O M M E N T	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm