AP60P20Q
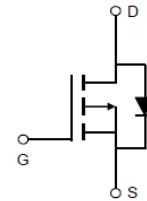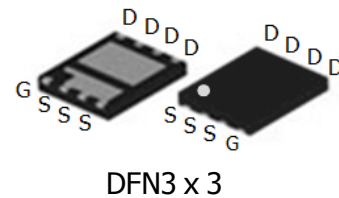## P-Channel Enhancement Mosfet

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Feature

- -20V,-60A
  $R_{DS(ON)} < 7.0m\Omega @V_{GS}=-4.5V$
  $R_{DS(ON)} < 9.0m\Omega @V_{GS}=-2.5V$
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge

Application

- PWM applications
- Load Switch
- Power management

DFN3 x 3

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
60P20Q	AP60P20Q	PDFN3X3-8L	13 inch	-	5000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current (Ta =25℃)	I_D	-60	A
Continuous Drain Current (Ta =100℃)	I_D	-42	A
Pulsed Drain Currenr [1]	I_{DM}	-240	A
Power Dissipation	P_D	80	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.6	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

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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	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-20V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±12V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage[3]	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	0.35	0.6	1.0	V
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-20A	-	5.8	7.0	mΩ
		V_{GS} =-2.5V, I_D =-10A	-	7.0	9.0	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =-10V, V_{GS} =0V, f =1MHz	-	3600	-	pF
Output Capacitance	C_{oss}		-	572	-	
Reverse Transfer Capacitance	C_{rss}		-	440	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=-10V, I_D=-15A, R_L=0.5Ω V_{GS}=-4.5V, R_G=3Ω	-	18	-	ns
Turn-on rise time	t_r		-	43	-	
Turn-off delay time	$t_{d(off)}$		-	85	-	
Turn-off fall time	t_f		-	23	-	
Total Gate Charge	Qg	V_{DS}=-10V, I_D=-20A, V_{GS}=-4.5V	-	55	-	nC
Gate-Source Charge	Qgs		-	10	-	
Gate-Drain Charge	Qgd		-	15	-	
Source-Drain Diode characteristics						
Diode Forward voltage[2]	V_{DS}	V_{GS} =0V, I_S=-20A	-	-	-1.2	V
Diode Forward current[3]	I_S		-	-	-60	A

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature

2. Pulse Test: pulse width≤300μs, duty cycle≤2%

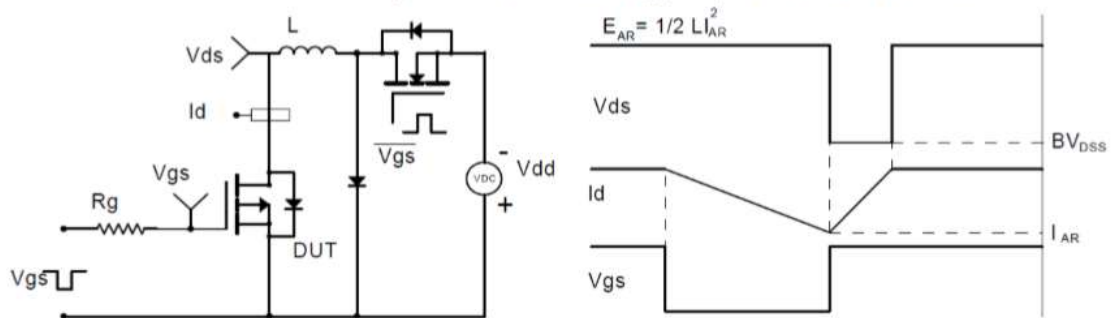3. Surface Mounted on FR4 Board,t≤10 sec

Test Circuit

Gate Charge Test Circuit & Waveform
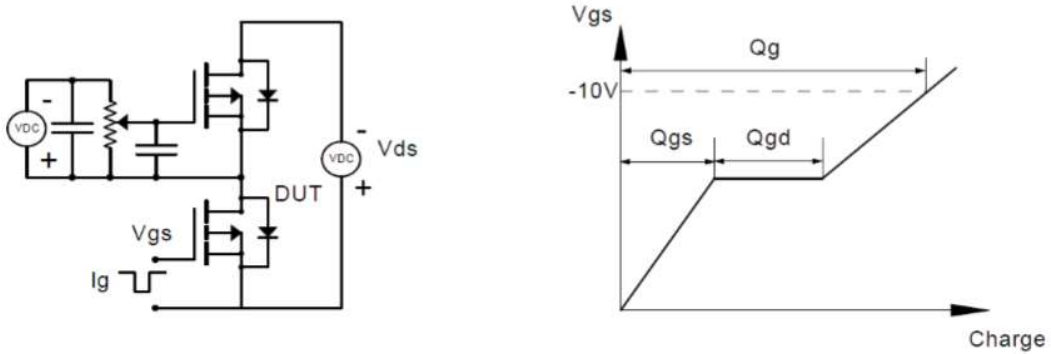
Resistive Switching Test Circuit & Waveforms
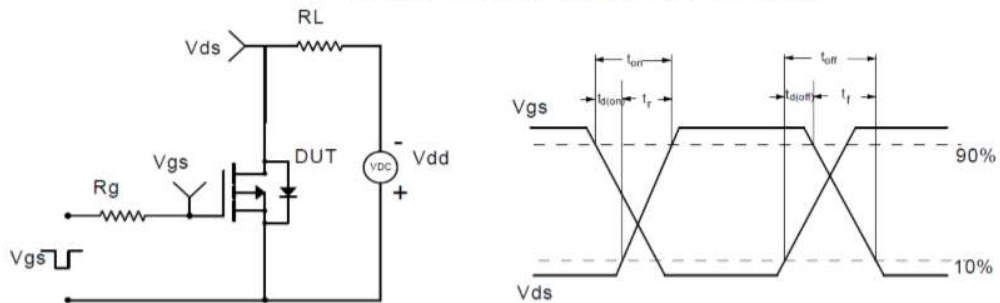
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms
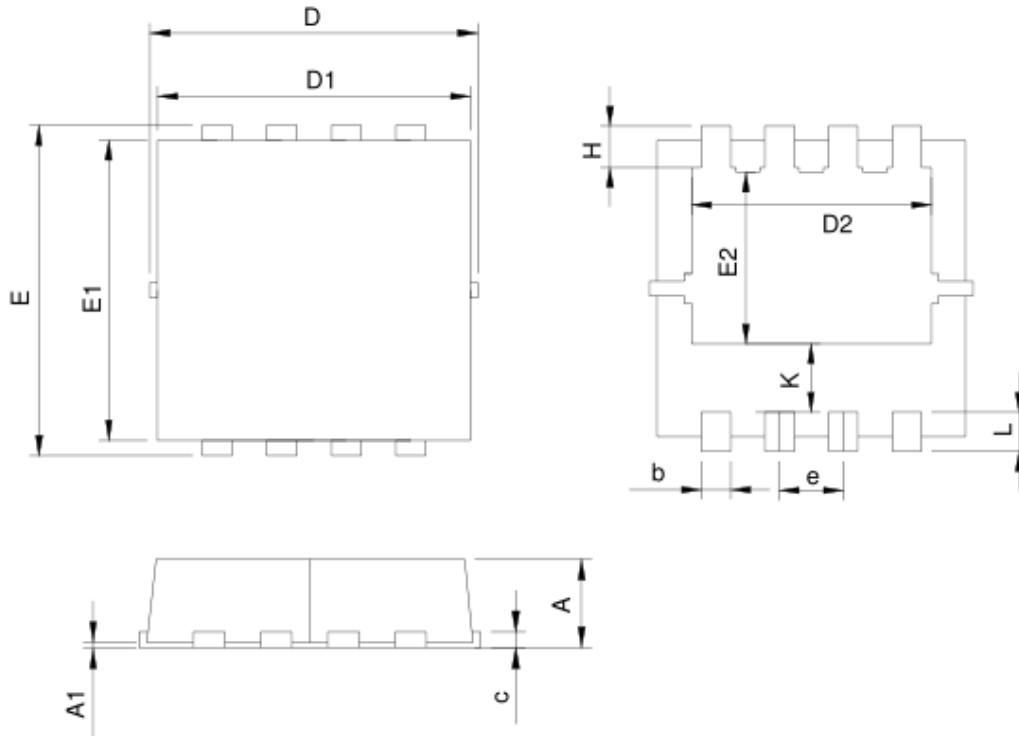
$$E_{AR} = 1/2\ LI_{AR}^2$$

Diode Recovery Test Circuit & Waveforms
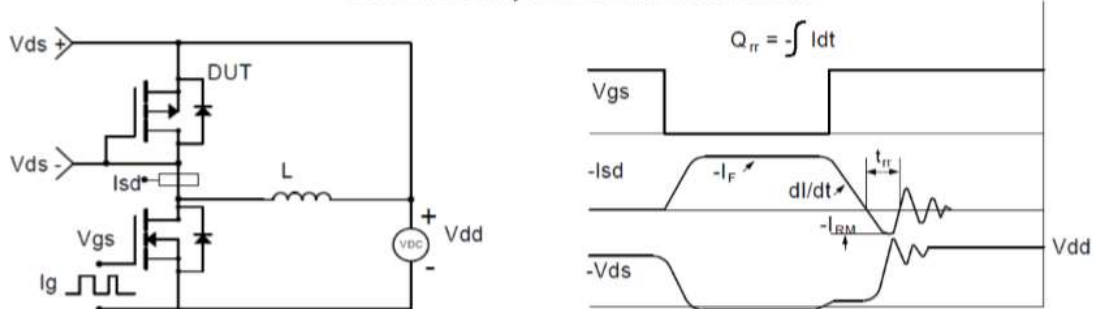
$$Q_{rr} = -\int Idt$$

PDFN3X3-8L Package Information

S Y M B O L	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
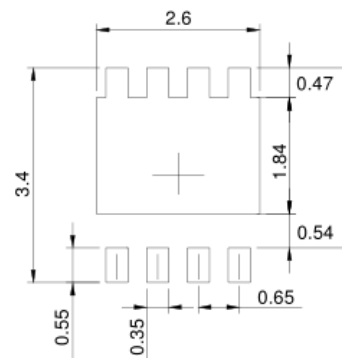
UNIT: mm

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