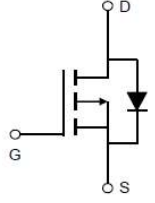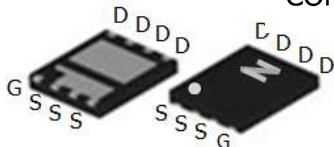## P-Channel Power MOSFET

● **General Description**

  The AP30P30Q combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDS(ON) . This device is ideal for load switch and battery protection applications.

● **Features**

■ Advance high cell density Trench technology

■ Low $R_{DS(ON)}$ to minimize conductive loss

■ Low Gate Charge for fast switching

■ Low Thermal resistance

● **Application**

■ MB/VGA Vcore

■ SMPS 2nd Synchronous Rectifier

■ POL application

■ BLDC Motor driver

$V_{DS} = -30V$

$R_{DS(ON)} = 10m\Omega$

$I_D = -30A$

■ RoHS COMPLIANT

DFN3 x 3

● **Ordering Information:**

Marking	30P30
Packing	REEL TAPE
Basic ordering unit (pcs)	5000
Normal Package Material Ordering Code	AP30P30Q-TAP
Halogen Free Ordering Code	AP30P030Q-TAP-HF

● **Absolute Maximum Ratings（ $T_C = 25℃$ ）**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(TC=25℃)	I_D	-30	A
Pulsed Drain Current [①]	I_{DM}	-90	A
Total Power Dissipation[②]	P_D@TC=25℃	40	W
Total Power Dissipation	P_D@TA=25℃	1.5	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃

AIIPOWER

P-Channel Power MOSFET

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case[2]	R_{thJC}	-	-	34	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	180	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250uA$	-30			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250uA$	-0.8		-2.0	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$			-1.0	uA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm12V, V_{DS}=0V$			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-15A$		7	10	mΩ
		$V_{GS}=-4.5V, I_D=-8A$		10	13	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-5A$		9		s

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss		-	2150	-	
Output capacitance	Coss	f = 1MHz	-	430	-	pF
Reverse transfer capacitance	Crss		-	320	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	VDD =15V	-	35	-	
Gate - Source charge	Qgs	ID = 15A	-	5	-	nC
Gate - Drain charge	Qgd	VGS = 10V	-	10	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate；

P-Channel Power MOSFET

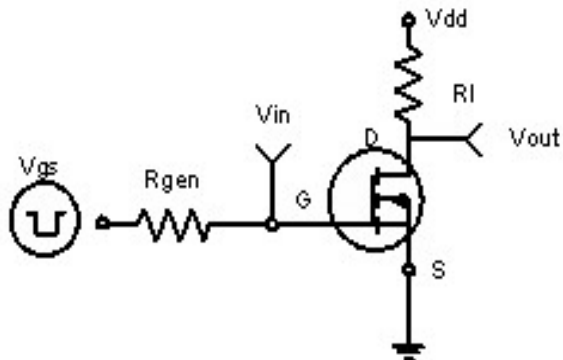## Typical Electrical and Thermal Characteristics
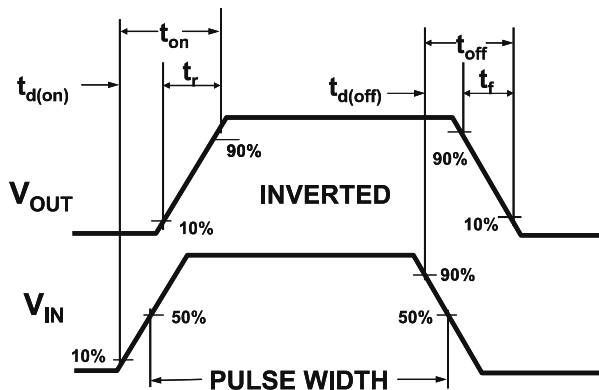
Figure 1 Switching Test Circuit

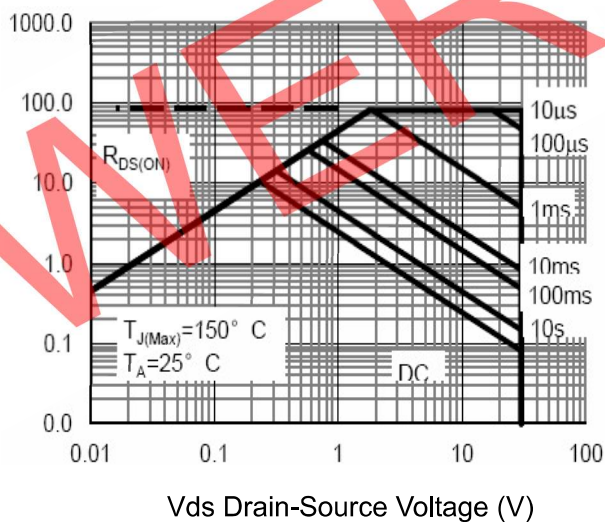**Figure 2 Switching Waveforms**

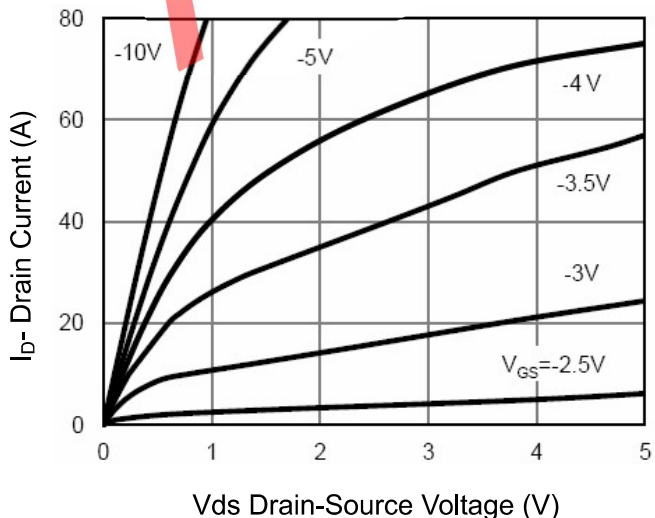**Figure 3 Power Dissipation**

Figure 4 Safe Operation Area

Figure 5 Output Characteristics

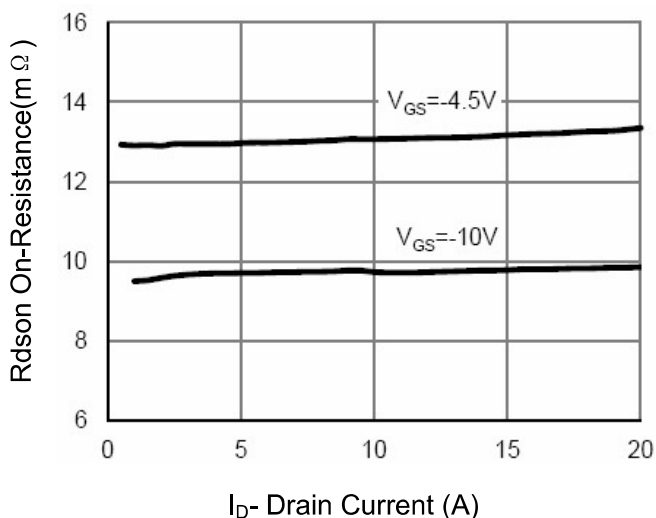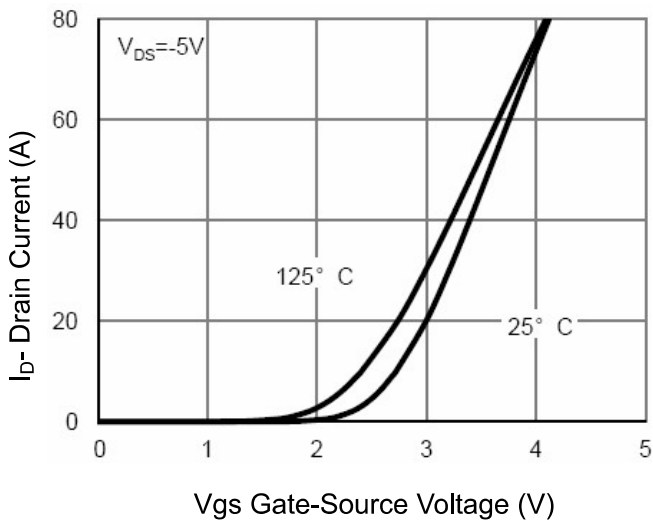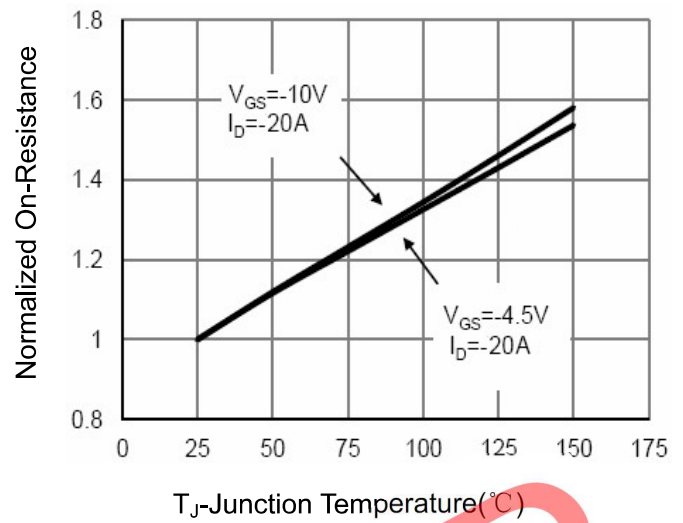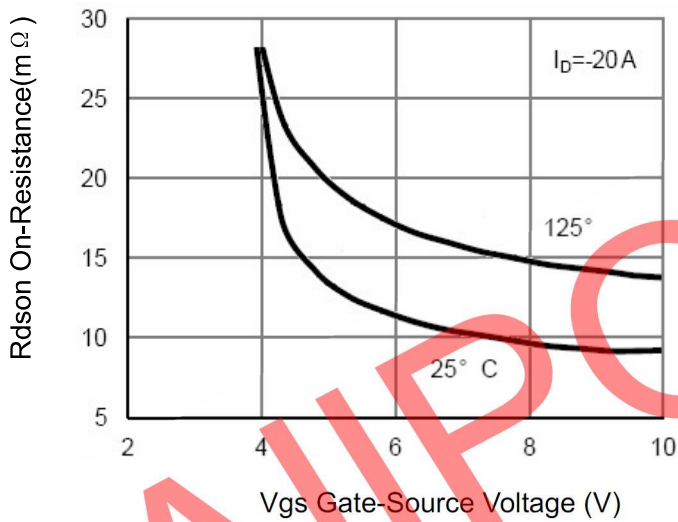**Figure 6 Drain-Source On-Resistance**

P-Channel Power MOSFET

Figure 7 Transfer Characteristics

Figure 8 Drain-Source On-Resistance

Figure 9 Rdson vs Vgs
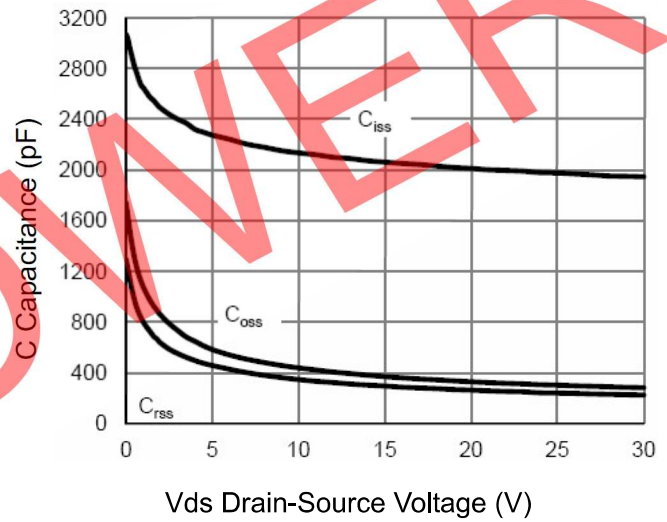
Figure 10 Capacitance vs Vds
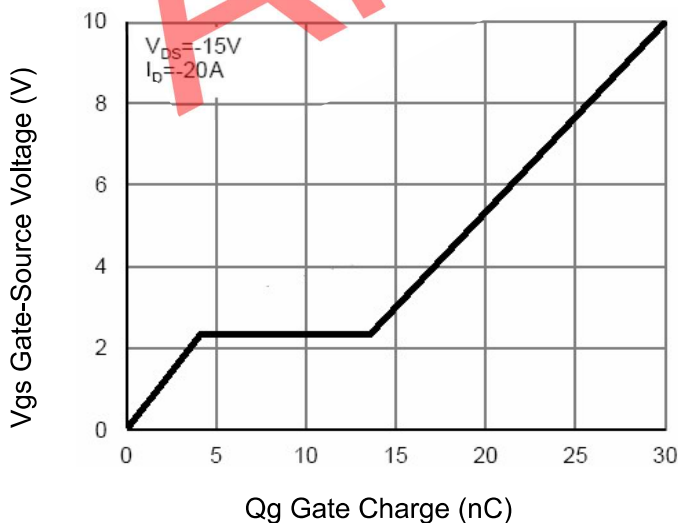
Figure 11 Gate Charge
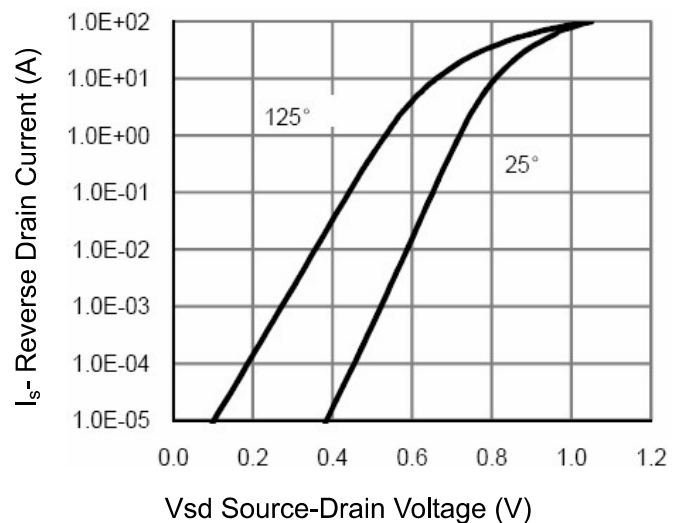
Figure 12 Source- Drain Diode Forward

●**Dimensions(DFN3×3)**
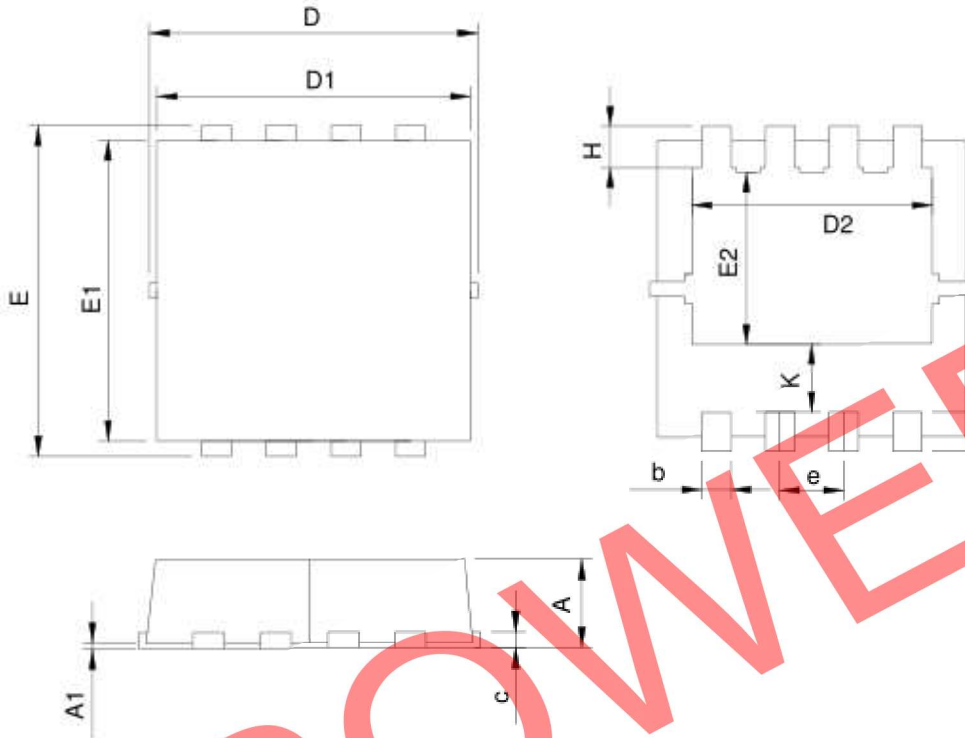
SYMBOL	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	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