

AP25P06Q

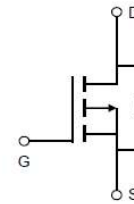
P-Channel Enhancement Mosfet

AIIPOWER

DATA SHEET

Feature

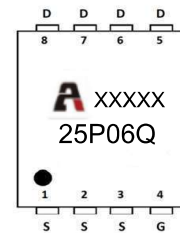
- -60V,-25A
 $R_{DS(ON)} < 60m\Omega @ V_{GS} = -10V$ TYP:50 m Ω
 $R_{DS(ON)} < 72m\Omega @ V_{GS} = -4.5V$ TYP:60 m Ω
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic Diagram

Application

- PWM applications
- Load Switch
- Power management



Marking and pin Assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
25P06Q	AP25P06Q	PDFN3X3	13 inch	-	5000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_a=25^{\circ}C$)	I_D	-25	A
Continuous Drain Current ($T_a=100^{\circ}C$)	I_D	-19	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	-100	A
Single Pulsed Avalanche Energy ⁽⁴⁾	E_{AS}	50	mJ
Power Dissipation	P_D	35	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	3.5	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

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

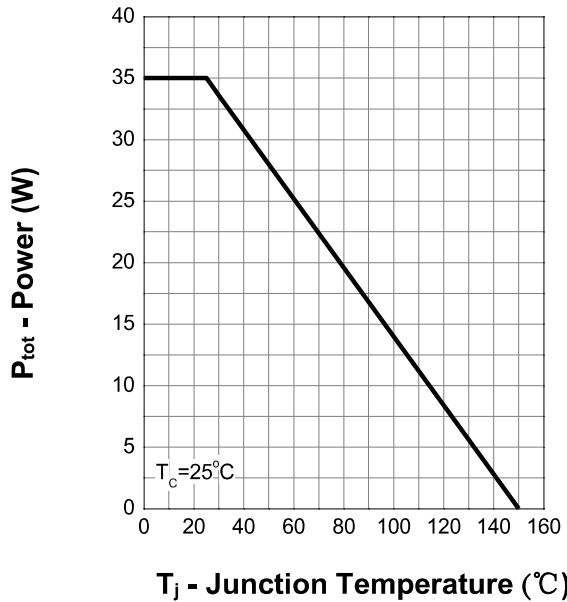
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -60V, V_{GS} = 0V$	-	-	1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage ⁽³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.5	-2.0	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$	-	50	60	m Ω
		$V_{GS} = -4.5V, I_D = -5A$	-	60	72	
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -30V, V_{GS} = 0V, f = 1MHz$	-	1408	-	pF
Output Capacitance	C_{oss}		-	64	-	
Reverse Transfer Capacitance	C_{rss}		-	47	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -30V, I_D = -10A, R_L = 3\Omega$ $V_{GS} = -4.5V, R_G = 4.5\Omega$	-	14	-	ns
Turn-on rise time	t_r		-	51	-	
Turn-off delay time	$t_{d(off)}$		-	197	-	
Turn-off fall time	t_f		-	112	-	
Total Gate Charge	Q_g	$V_{DS} = -30V, I_D = -10A,$ $V_{GS} = -10V$	-	23	-	nC
Gate-Source Charge	Q_{gs}		-	6.5	-	
Gate-Drain Charge	Q_{gd}		-	3	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽²⁾	V_{DS}	$V_{GS} = 0V, I_S = -10A$	-	-	-1.3	V
Diode Forward current ⁽³⁾	I_S		-	-	-25	A
Body Diode Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}, I_F = -10A, di/dt = 100A/\mu s$		25		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$T_J = 25^{\circ}, I_F = -10A, di/dt = 100A/\mu s$		7.5		nc

Notes:

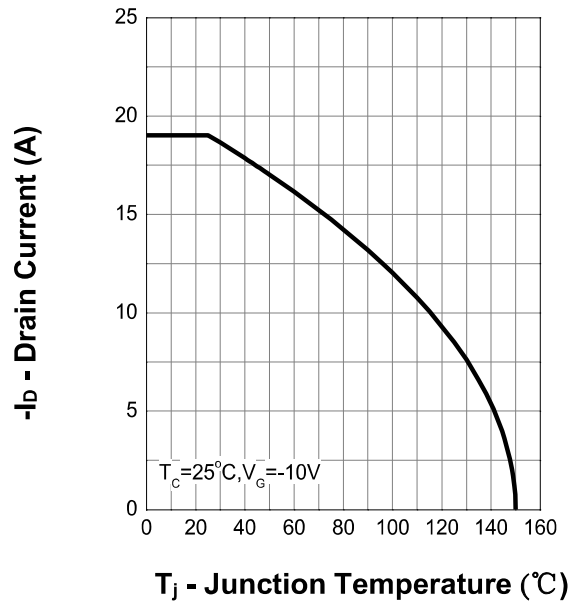
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Surface Mounted on FR4 Board, $t \leq 10$ sec
4. EAS Condition: $T_J = 25^{\circ}\text{C}, V_{DD} = -30V, R_G = 25\Omega, L = 0.5mH$

Typical Performance Characteristics

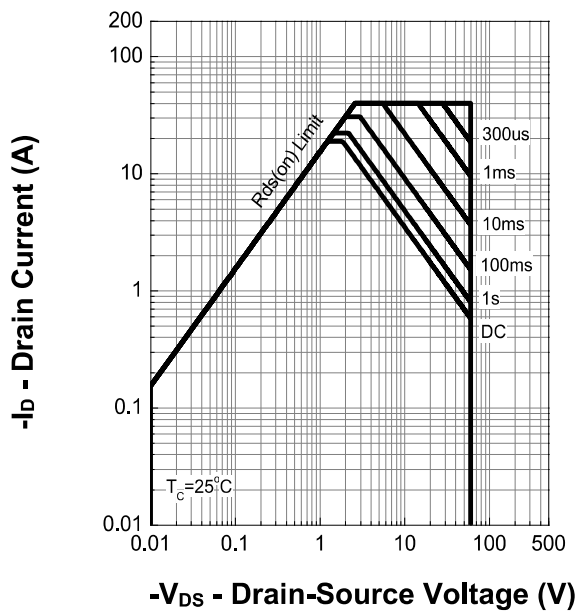
Power Dissipation



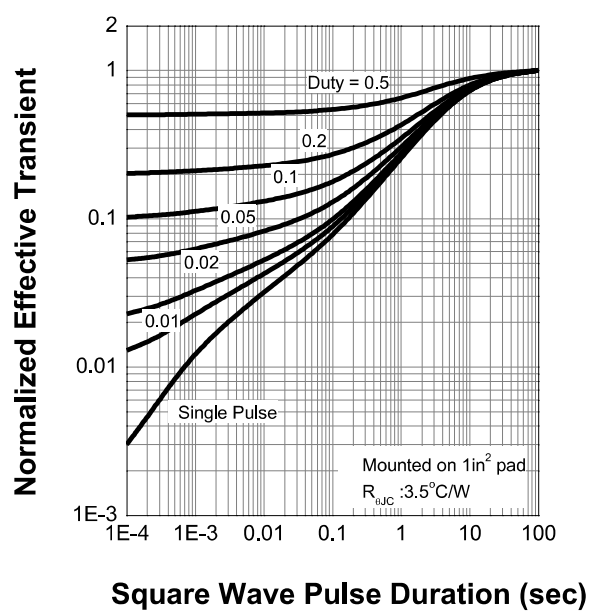
Drain Current



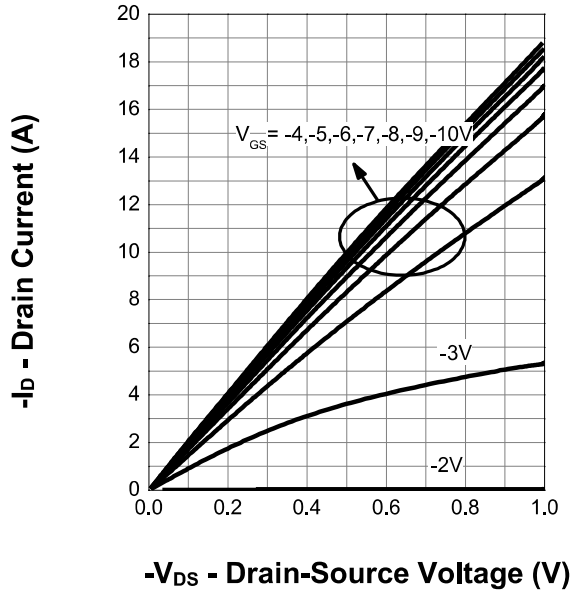
Safe Operation Area



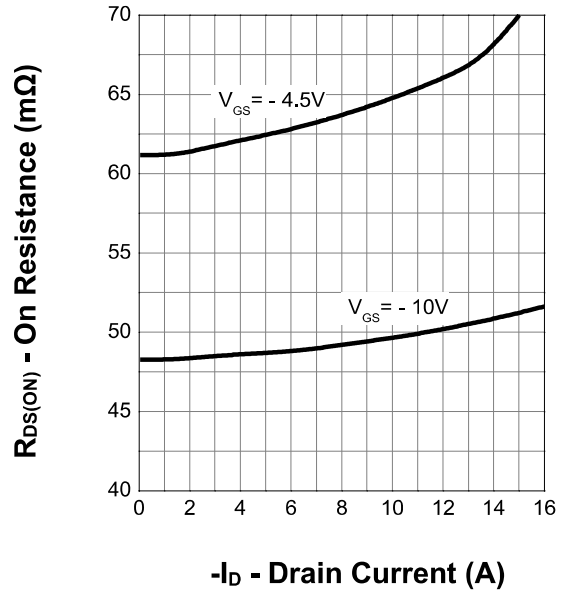
Thermal Transient Impedance



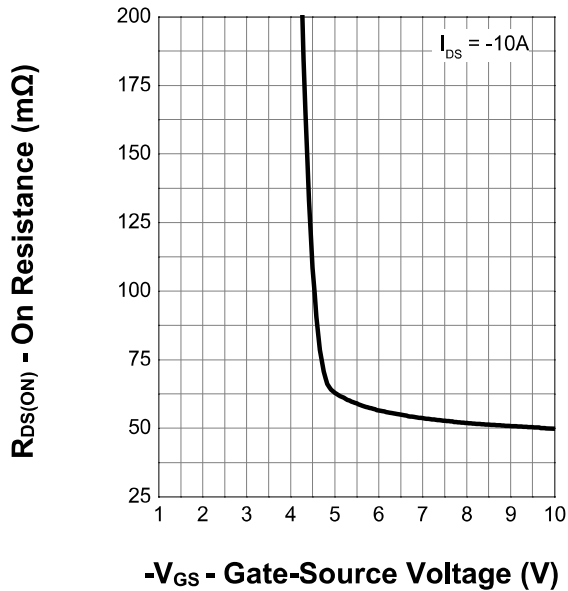
Output Characteristics



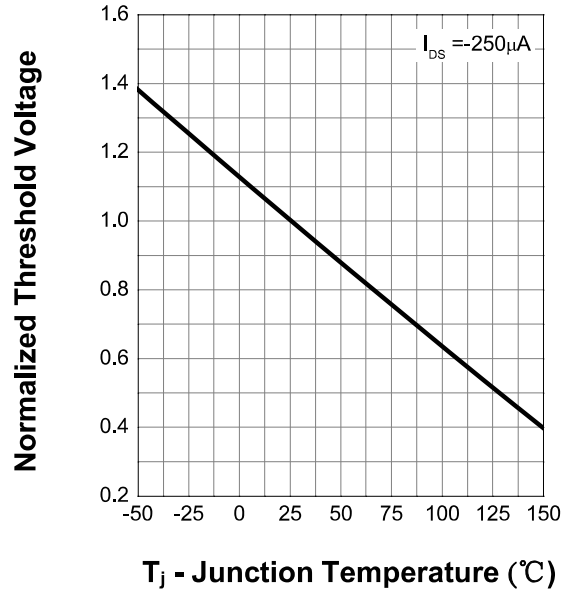
Drain-Source On Resistance



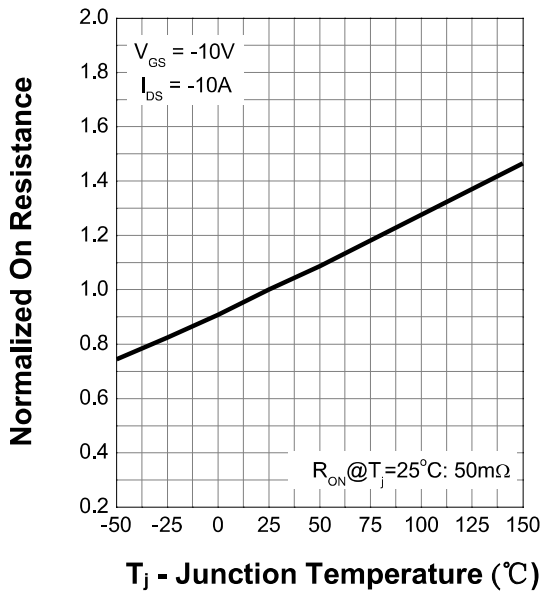
Transfer Characteristics



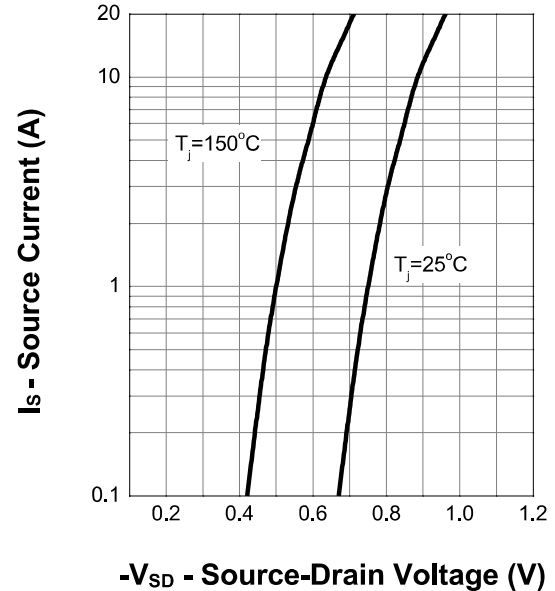
Gate Threshold Voltage



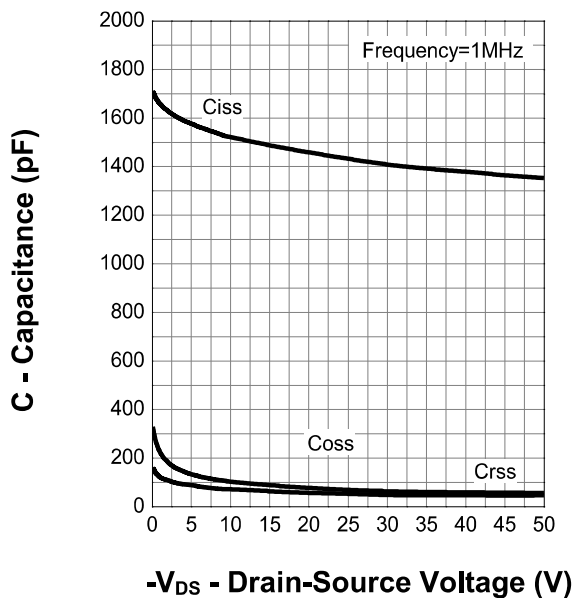
Drain-Source On Resistance



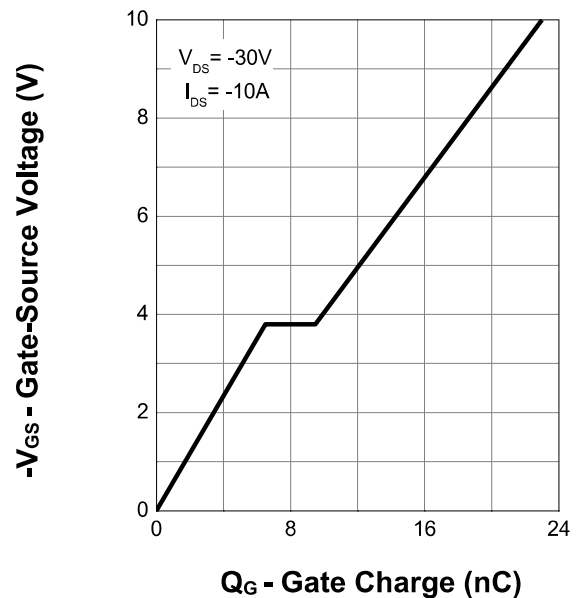
Source-Drain Diode Forward



Capacitance



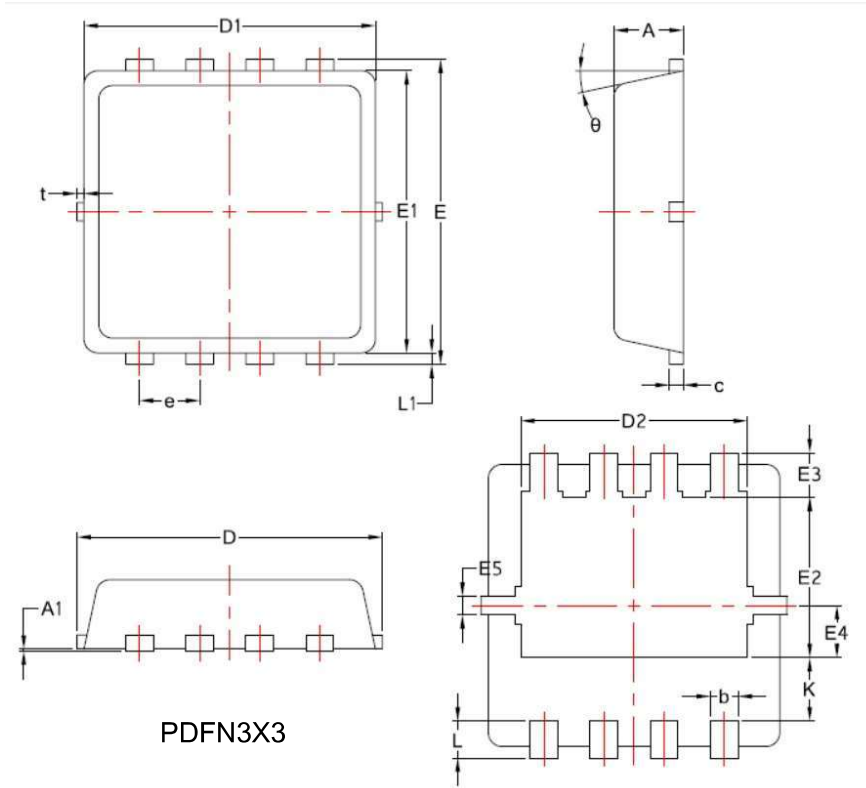
Gate Charge



AP25P06Q

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Package Mechanical Data



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°