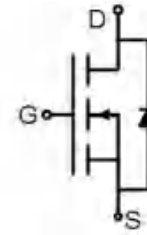


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Feature

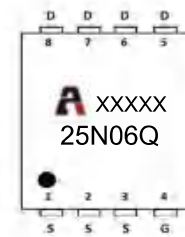
- 60V,20A
 $R_{DS(ON)} < 29m\Omega @ V_{GS}=10V$ TYP:24 m Ω
 $R_{DS(ON)} < 33m\Omega @ V_{GS}=4.5V$ TYP:28.5 m Ω
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



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)
25N06Q	AP25N06Q	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}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^\circ\text{C}$)	I_D	20	A
Continuous Drain Current ($T_C=100^\circ\text{C}$)	I_D	14	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	60	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	34	mJ
Power Dissipation	P_D	20	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	7.2	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

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MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

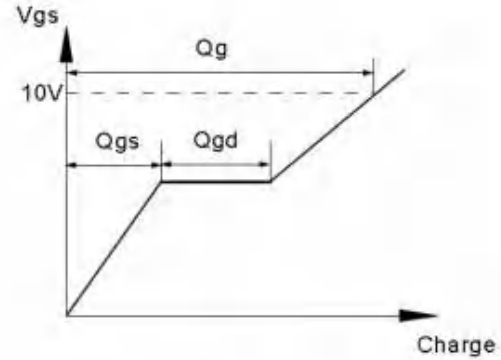
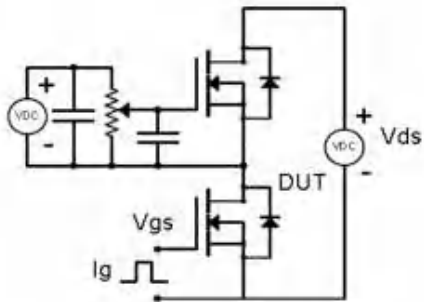
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	60	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage ⁽³⁾	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.1	1.6	2.2	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} = 10V, I _D = 15A	-	24	29	mΩ
		V _{GS} = 4.5V, I _D = 10A	-	28.5	33	
Forward tranconductance ⁽³⁾	g _{FS}	V _{DS} = 10V, I _D = 15A	20	-	-	S
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz	-	1090	-	pF
Output Capacitance	C _{oss}		-	56	-	
Reverse Transfer Capacitance	C _{rss}		-	47	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} = 30V, I _D = 20A V _{GS} = 10V, R _G = 1.8Ω	-	7.2	-	ns
Turn-on rise time	t _r		-	19	-	
Turn-off delay time	t _{d(off)}		-	14	-	
Turn-off fall time	t _f		-	22	-	
Total Gate Charge	Q _g	V _{DS} = 30V, I _D = 10A, V _{GS} = 10V	-	19.2	-	nC
Gate-Source Charge	Q _{gs}		-	3.6	-	
Gate-Drain Charge	Q _{gd}		-	5.1	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{DS}	V _{GS} = 0V, I _S = 15A	-	-	1.2	V
Diode Forward current ⁽⁴⁾	I _S		-	-	20	A
Body Diode Reverse Recovery Time	t _{rr}	T _J = 25° , I _F = 20A, di/dt = 100A/us		27		ns
Body Diode Reverse Recovery Charge	Q _{rr}	T _J = 25° , I _F = 20A, di/dt = 100A/us		40		nc

Notes:

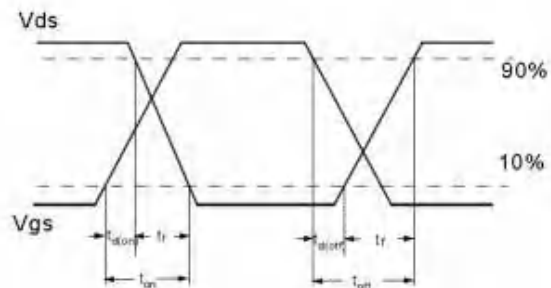
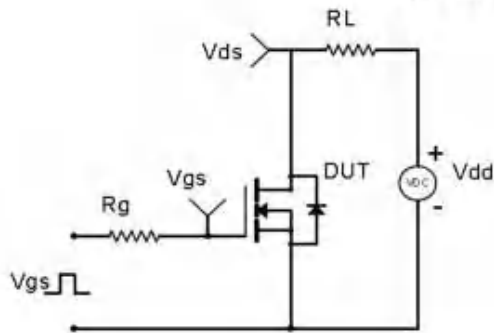
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: T_J = 25°C, V_{DD} = 30V, R_G = 25Ω, L = 0.5mH
3. Pulse Test: pulse width ≤ 300μs, duty cycle ≤ 2%
4. Surface Mounted on FR4 Board, t ≤ 10 sec

Test Circuit & Waveform

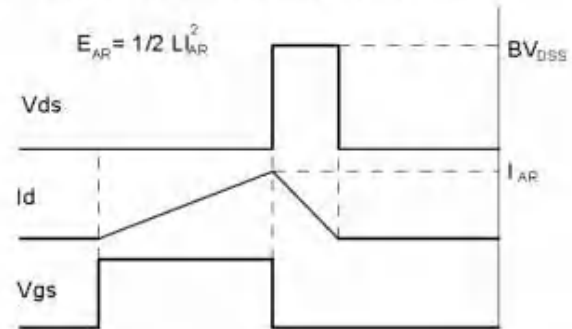
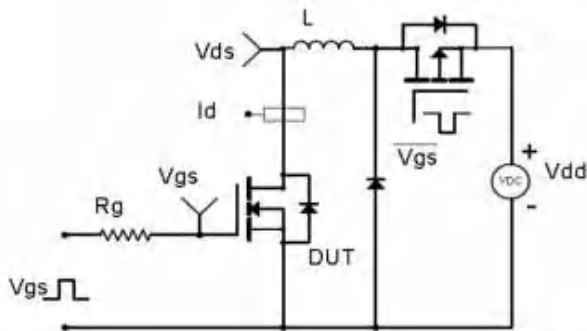
Gate Charge Test Circuit & Waveform



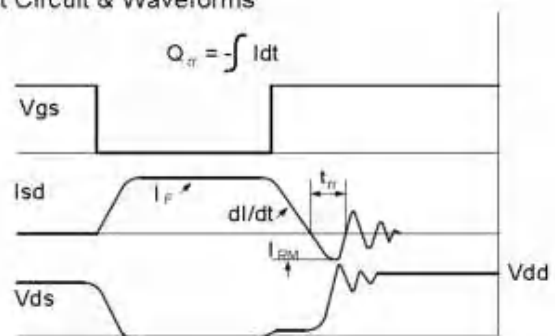
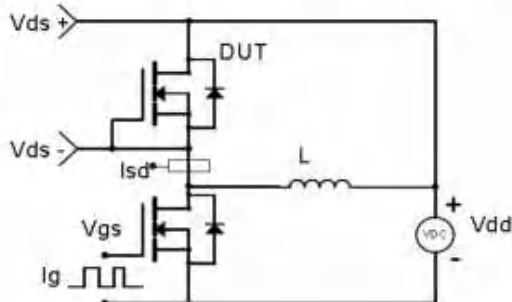
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

Fig.1 Output Characteristics

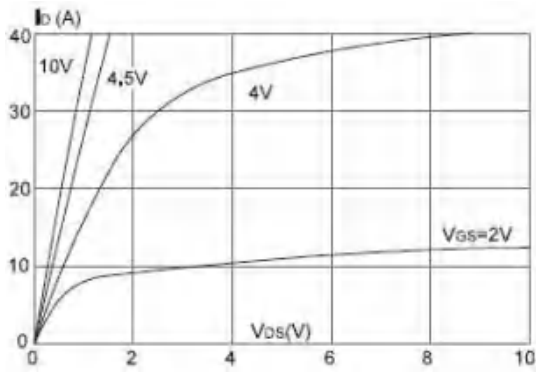


Fig.2 Typical Transfer Characteristics

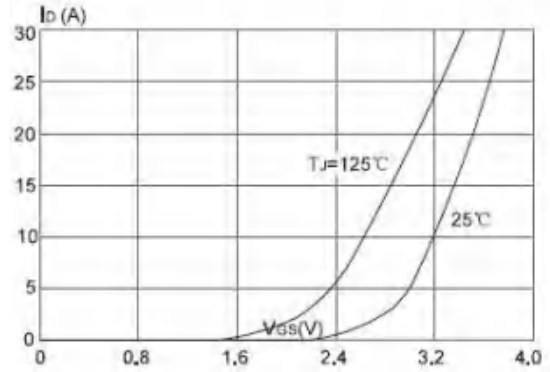


Fig.3 On-resistance VS Drain Current

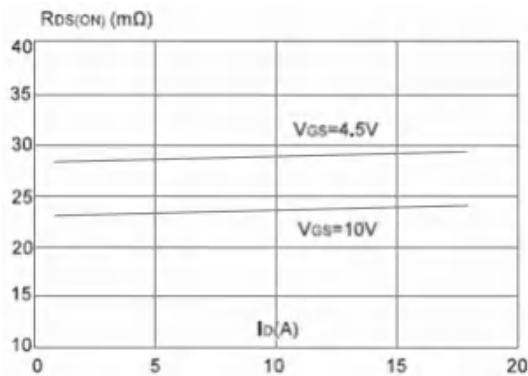


Fig. 4 Body Diode Characteristics

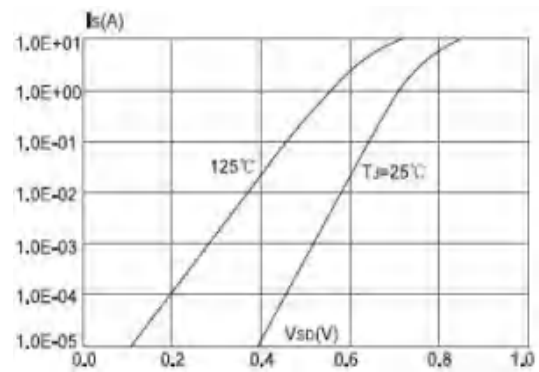


Fig.5 Gate Charge Characteristics

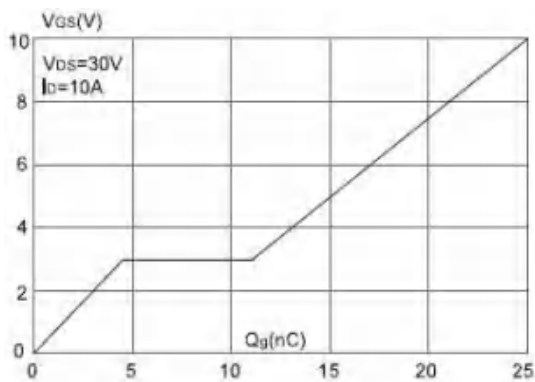
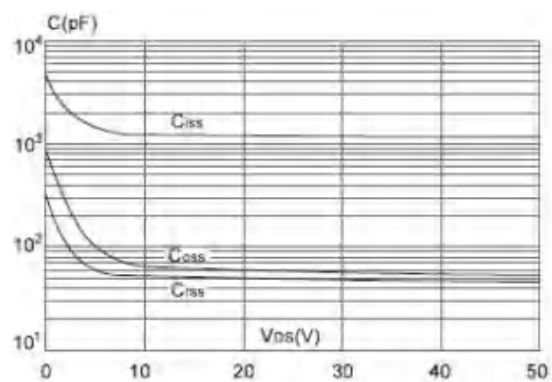


Fig. 6 Capacitance Characteristics



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Fig.7 Normalized Breakdown Voltage VS Junction Temperature

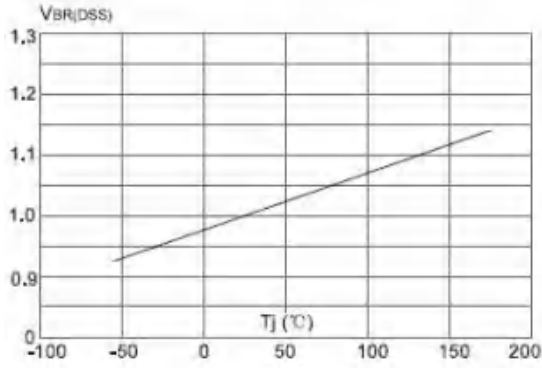


Fig. 8 Normalized On-Resistance Variation VS Junction Temperature

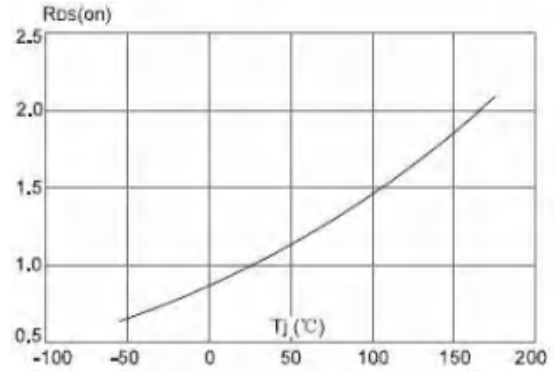


Fig.9 Maximum Continuous Drain Current VS. Case Temperature

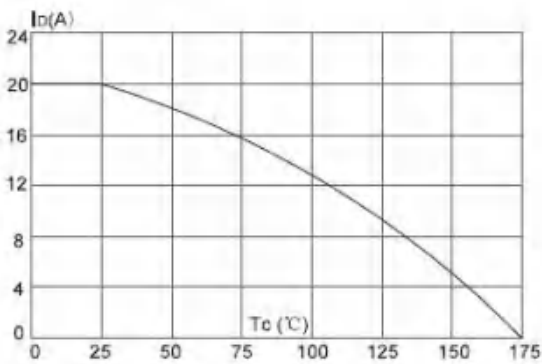


Fig.10 Safe Operating Area

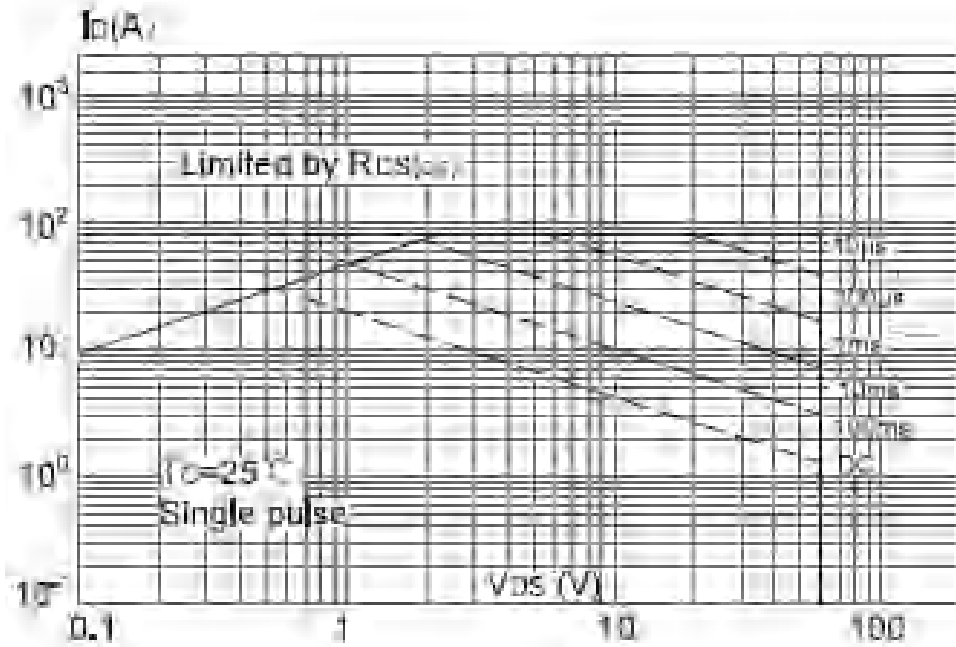
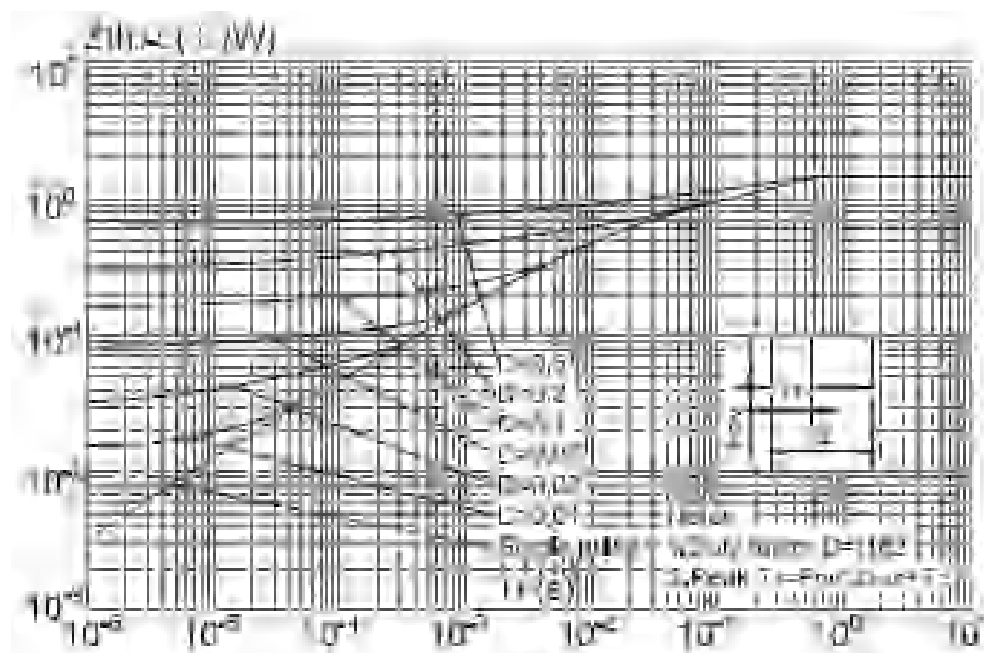


Fig. 11 Transient Thermal Response Curve



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PDFN3X3 Package Information

