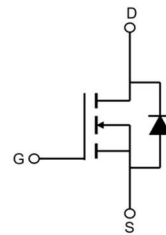


Features

- 60V,25A
 $R_{DS(ON)} < 35m\Omega @ V_{GS}=10V$ TYP:26m Ω
- Advanced Trench Technology
- High density cell design for ultra low RDS(ON)
- Fully characterized avalanche voltage and current
- $T_{jmax}=175^{\circ}C$
- AEC-Q101 qualified



Schematic Diagram



Marking and pin assignment

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterrupted Power Supply (UPS)

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
25N06K-AU	AP25N06K-AU	TO-252	-	-	2500

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}C$)	I_D	25	A
Continuous Drain Current ($T_C=100^{\circ}C$)	I_D	17	A
Pulsed Drain Current	I_{DM}	70	A
Single Pulsed Avalanche Energy ⁽⁵⁾	E_{AS}	100	mJ
Drain Power Dissipation	P_D	50	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	3.0	$^{\circ}C/W$
Thermal Resistance- Junction to Ambient	$R_{\theta JA}$	70	$^{\circ}C/W$
Junction Temperature	T_J	175	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +175	$^{\circ}C$

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

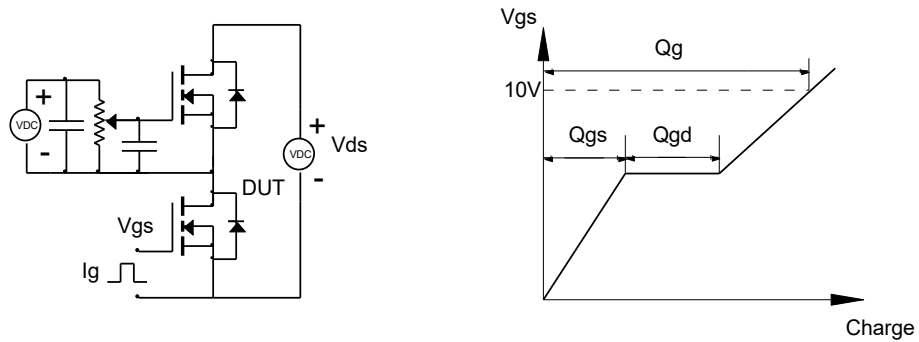
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	60	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	-	3.0	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =15A	-	26	35	mΩ
Forward Trans conductance	G _{fs}	V _{GS} =5V, I _D =4.5A	11			S
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1.0MHz	-	1890	-	pF
Output Capacitance	C _{oss}		-	168	-	
Reverse Transfer Capacitance	C _{rss}		-	132	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =30V, I _D =2A, R _G =3Ω, R _L =6.7Ω V _G =10V	-	7	-	ns
Turn-on rise time	t _r		-	3.2	-	
Turn-off delay time	t _{d(off)}		-	19.2	-	
Turn-off fall time	t _f		-	3.2	-	
Total Gate Charge	Q _g	V _{DS} =48V, I _D =10A, V _{GS} =10V	-	49	-	nC
Gate-Source Charge	Q _{gs}		-	8	-	
Gate-Drain Charge	Q _{gd}		-	16	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{SD}	T _C =25°C, V _{GS} =0V, I _S =10A	-	-	1.2	V
Diode Forward current ⁽²⁾	I _S	T _C =25°C	-	-	25	A
Body Diode Reverse Recovery Time	t _{rr}	T _C =25°C, I _F =10A, di/dt=100A/us		35		ns
Body Diode Reverse Recovery Charge	Q _{rr}	T _C =25°C, I _F =10A, di/dt=100A/us		43		nc

Notes:

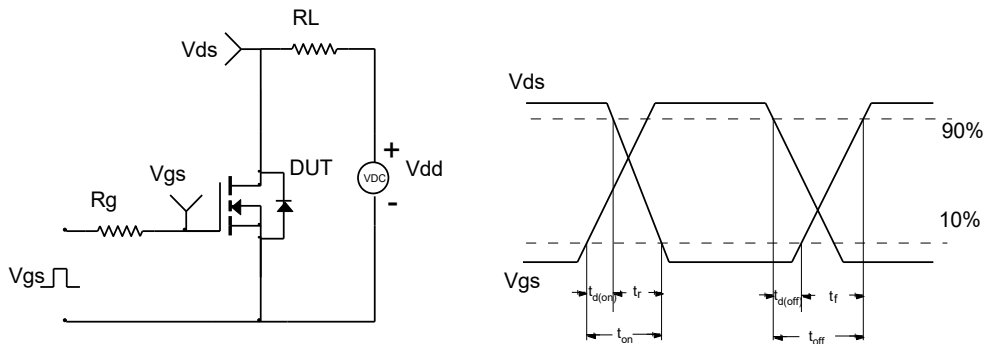
1. Repetitive Rating :Pulse width limited by maximum junction temperature
2. Surface Mounted on FR4 Board ,t≤10 sec
3. Pulse test :Pulse Width≤300 us ,Duty Cycle≤2%
4. Guaranteed by design ,not subject to production
5. EAS condition :T_J=25°C ,V_{DD}=30V,V_G=10V,L=0.5mH ,R_G=25Ω

Test Circuit

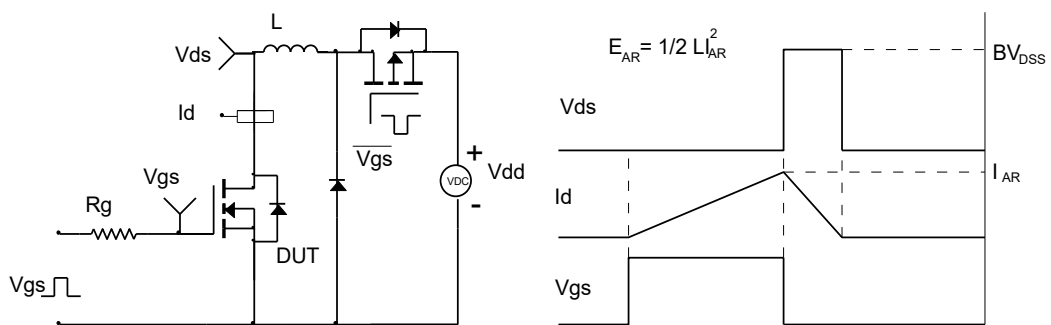
Gate Charge Test Circuit & Waveform



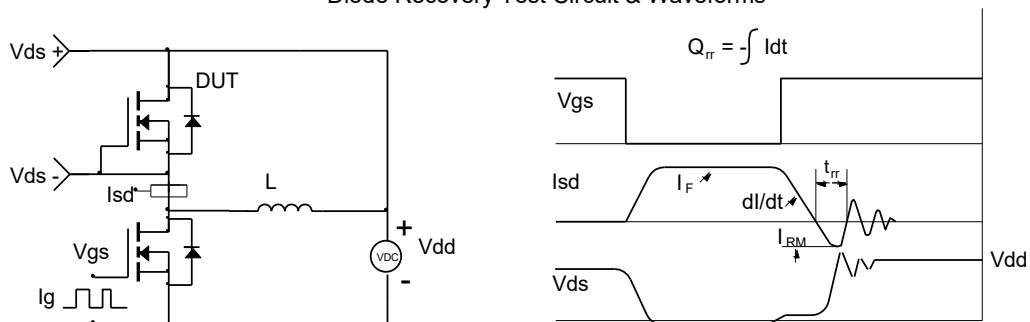
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

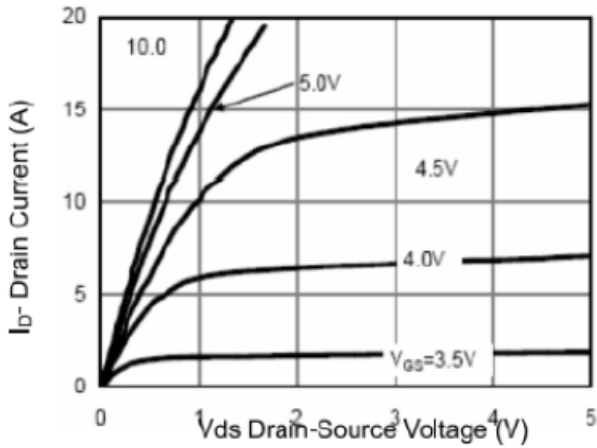


Figure 1 Output Characteristics

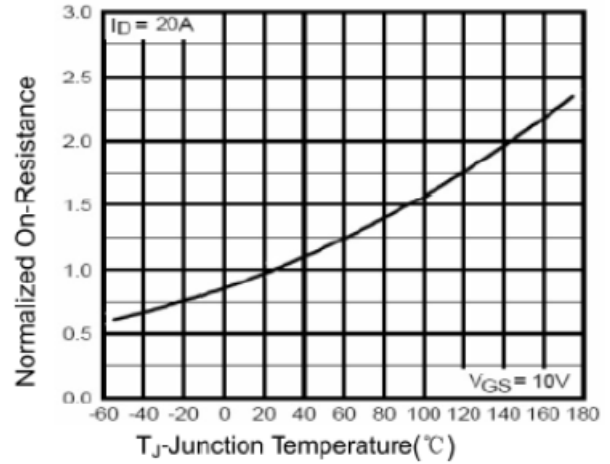


Figure 4 Rdson-Junction Temperature

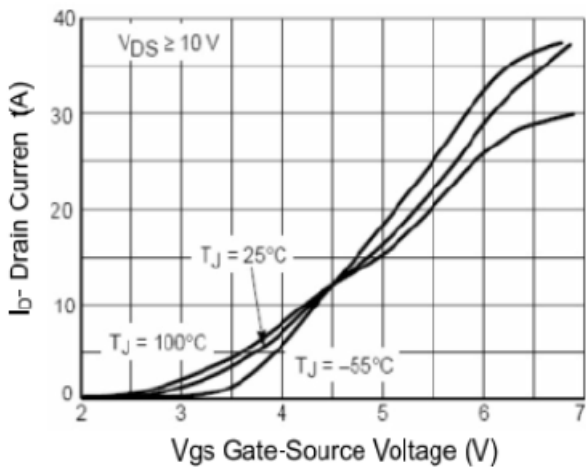


Figure 2 Transfer Characteristics

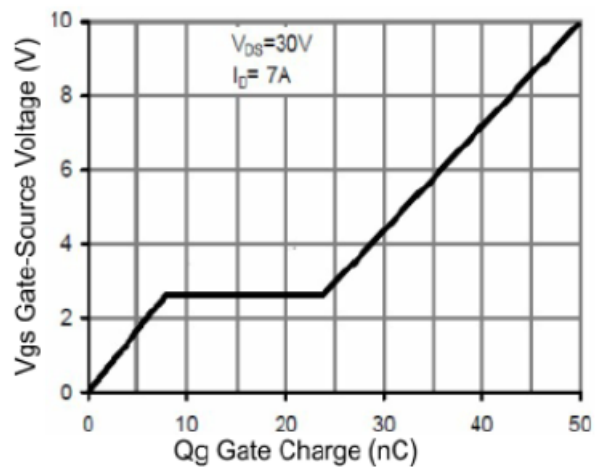


Figure 5 Gate Charge

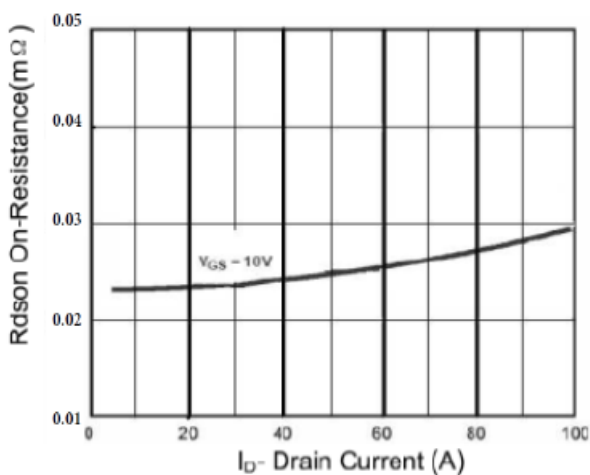


Figure 3 Rdson- Drain Current

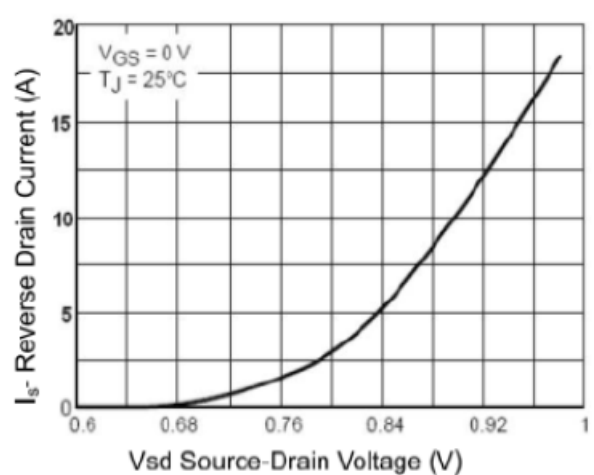


Figure 6 Source- Drain Diode Forward

Typical Performance Characteristics

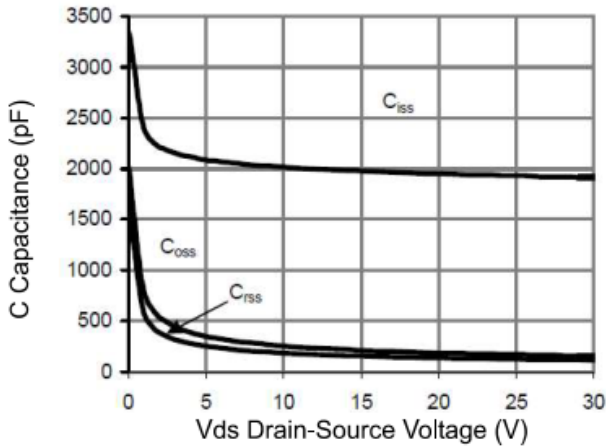


Figure 7 Capacitance vs Vds

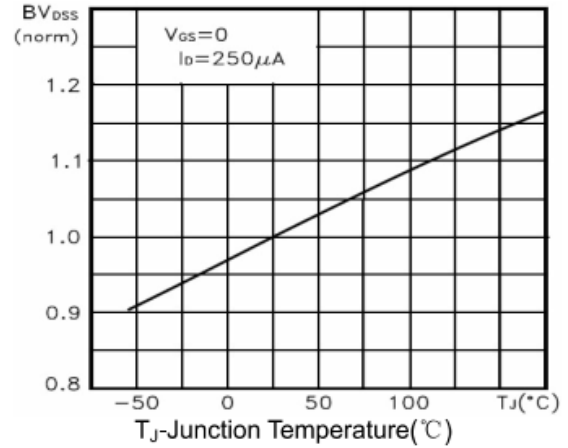


Figure 9 BV_{DSS} vs Junction Temperature

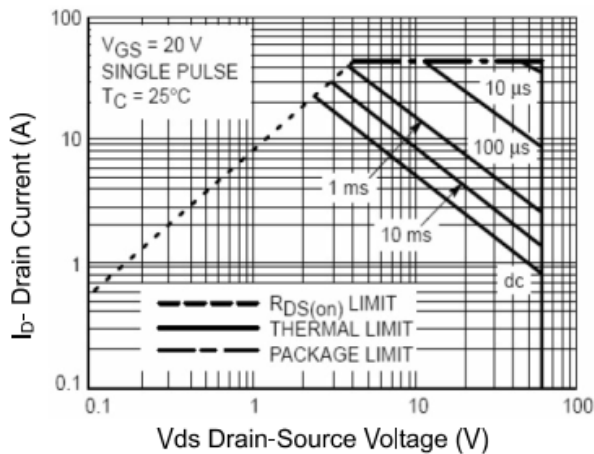


Figure 8 Safe Operation Area

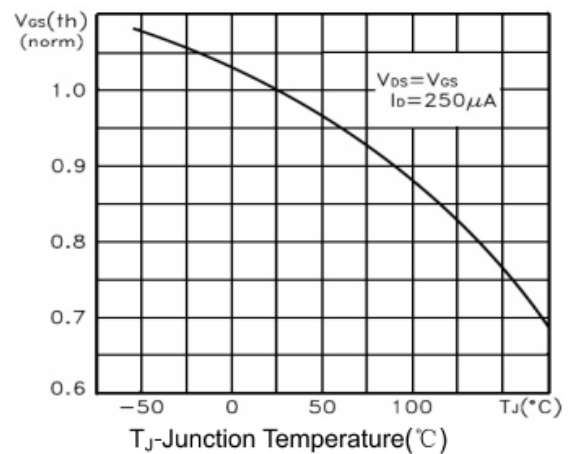


Figure 10 $V_{GS(th)}$ vs Junction Temperature

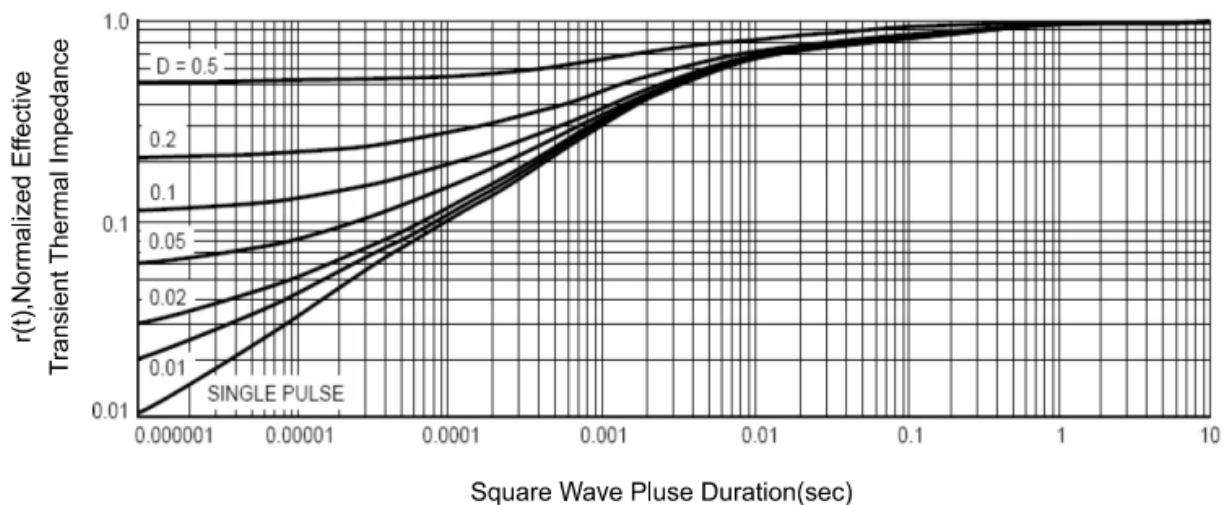
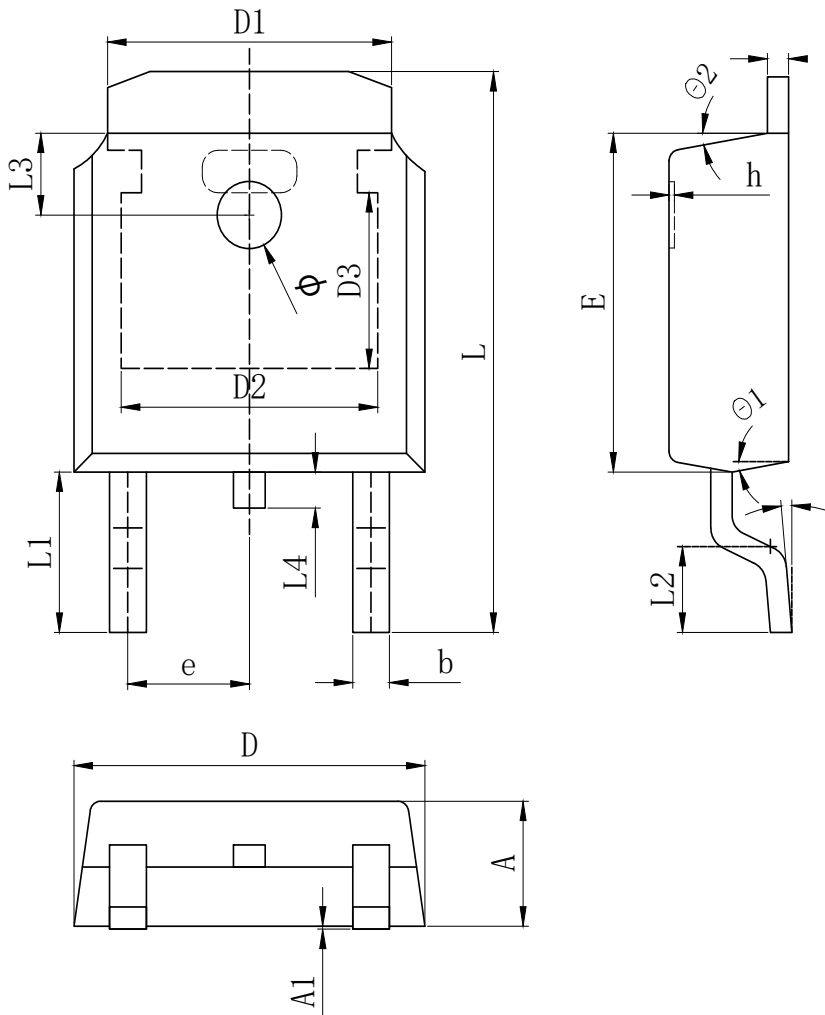


Figure 11 Normalized Maximum Transient Thermal Impedance

AP25N06K-AU
N-Channel Enhancement Mosfet

TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c (电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
Φ	1.100	1.200	1.300
θ	0°		8°
θ_1	9° TYP		
θ_2	9° TYP		

Revision History

Revision	Release	Remark
V1.0	2023/07/30	Initial Release

Disclaimer

The information given in this document describes the independent performance of the product, but similar performance is not guaranteed under other working conditions, and cannot be guaranteed when installed with other products or equipment. To achieve the required performance of the product in actual scenarios, the customer should conduct a complete application test to assess the functionality of the product.

Allpower assumes no responsibility for equipment failures result from using products at values that exceed the ratings, operating conditions, or other parameters listed in the product specifications.

The product described in this specification is not applicable for aerospace or other applications which requires high reliability. Customers using or selling these products for use in medical, life-saving, or life-sustaining applications do so at their own risk and agree to fully indemnify.

Due to product or technical improvements, the information described or contained herein may be changed without prior notice.