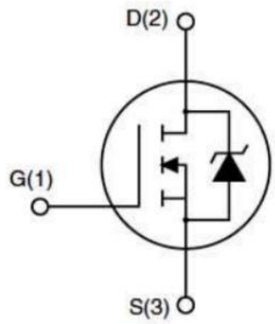
Features



- 30V,80A
  $R_{DS(ON)}$<4.2mΩ @V_{GS}=10V TYP:3.6mΩ
  $R_{DS(ON)}$<7.0mΩ @V_{GS}=10V TYP:5.5mΩ

- Advanced Trench Technology
- High Power and current handing capability
- Lead free product is acquired

Applications

- Load Switch
- Synchronous Rectification

Marking and pin Assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
040N03G	AP040N03G	PDFN5X6	-	-	5000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Tc=25℃)(1)	I_D	80	A
Continuous Drain Current (Tc=100℃)	I_D	48	A
Pulsed Drain Current (2,3)	I_{DM}	320	A
Drain Power Dissipation(1)	P_D	30	W
Single Pulsed Avalanche Energy	E_{AS}	200	mJ
Thermal Resistance from Junction to Case(1)	$R_{\theta JC}$	4.17	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	℃/W
Junction Temperature	T_J	-55~ +150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25℃ unless otherwise noted)

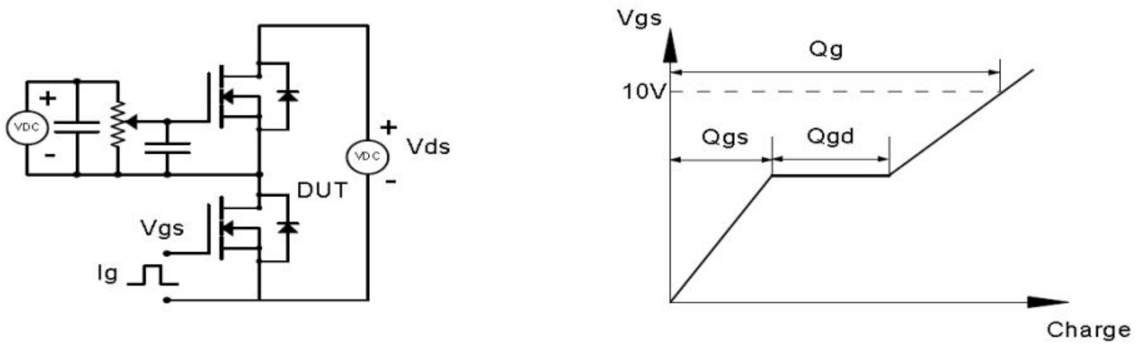
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =30V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.5	2	V
Drain-source on-resistance(4)	$R_{DS(on)}$	V_{GS} =10V, I_D =30A	-	3.6	4.2	mΩ
		V_{GS} =4.5V, I_D =20A	-	5.5	7.0	
Dynamic characteristics(5)						
Input Capacitance	C_{iss}	V_{DS} =25V, VGS=0V, f=1MHz	-	1950	2350	pF
Output Capacitance	C_{oss}		-	320	-	
Reverse Transfer Capacitance	C_{rss}		-	240	-	
Switching characteristics(5)						
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, I_D=15A, R_G=3.3Ω, V_{GS}=10V	-	13	-	nS
Turn-on rise time	t_r		-	36	-	
Turn-off delay time	$t_{d(off)}$		-	43	-	
Turn-off fall time	t_f		-	16	-	
Total Gate Charge	Qg	V_{DS}=24V, I_D=20A, V_{GS}=10V	-	42	84	nC
Gate-Source Charge	Qgs		-	3.9	-	
Gate-Drain Charge	Qgd		-	14	-	
Source-Drain Diode characteristics						
Diode Forward voltage(4)	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=30A	-	-	1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	80	A
Body Diode Reverse Recovery Time	trr	T_J=25℃, I_F=10A,di/dt=100A/us	-	16	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	5	-	nC

Notes:

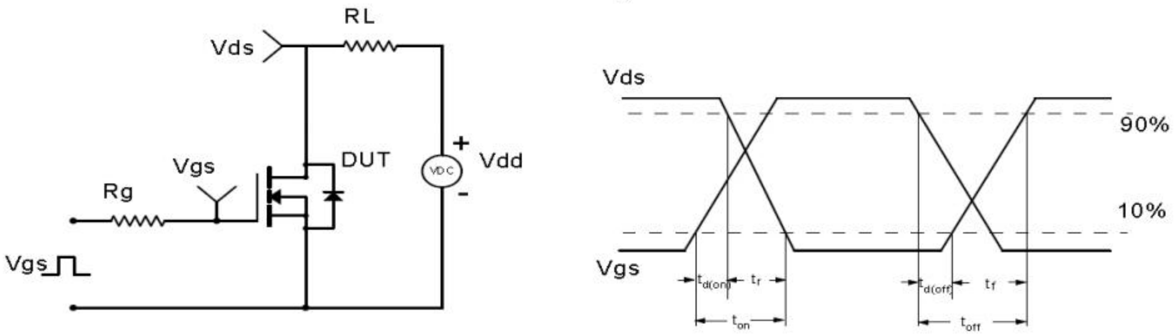
1) Surface Mounted on 1 in² pad area, t ≤ 10 sec
2) Pulse width ≤ 10μs, duty cycle ≤ 1 %
3) Limited by bonding wire
4) Pulse width ≤ 300 μs, duty cycle ≤ 2%
5) Guaranteed by design, not subject to production testing

Test Circuit & Waveform

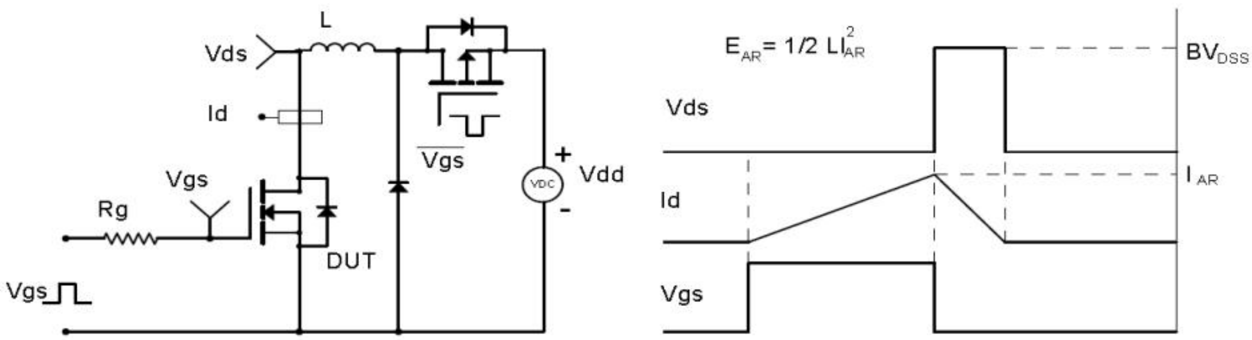
Gate Charge Test Circuit & Waveform



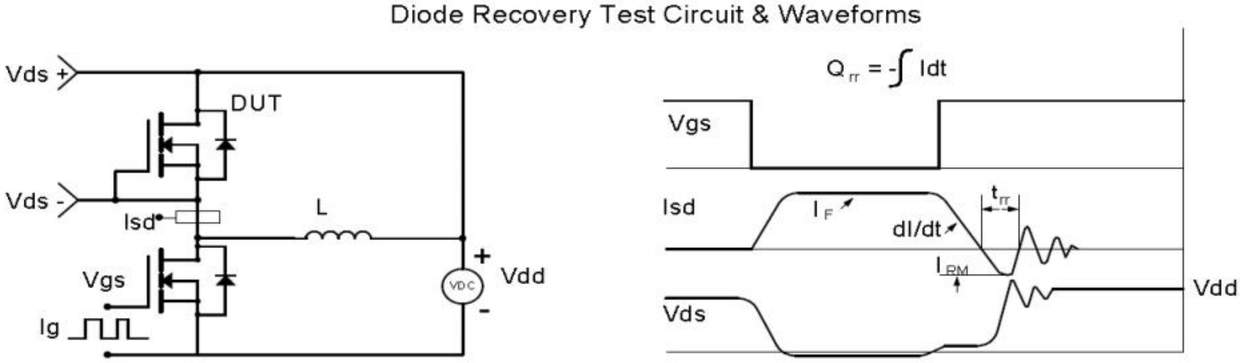
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Characteristics

Figure1: Output Characteristics

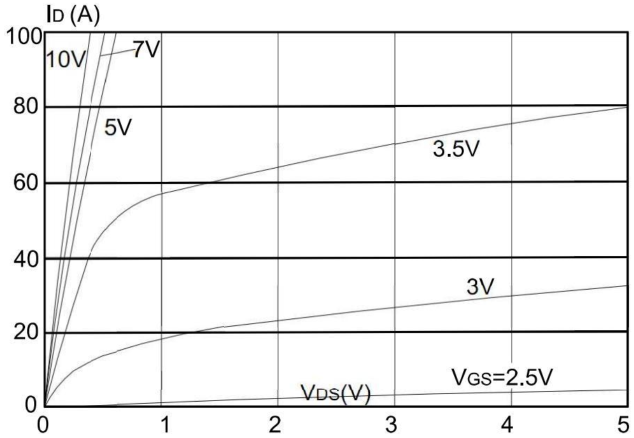


Figure 2: Typical Transfer Characteristics

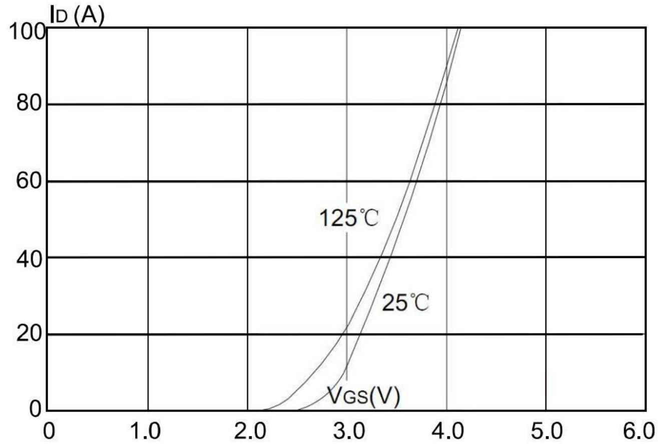


Figure 3: On-resistance vs. Drain Current

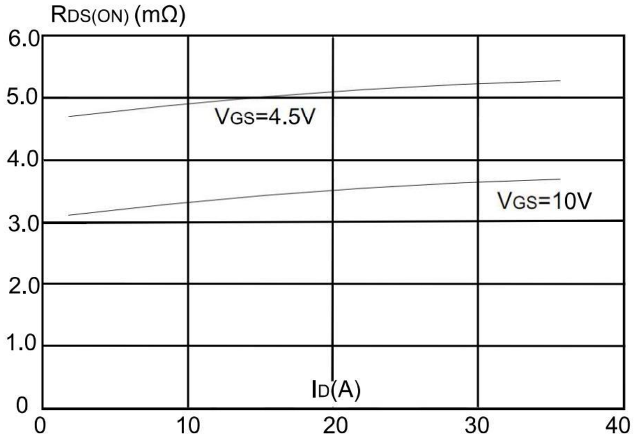


Figure 4: Body Diode Characteristics

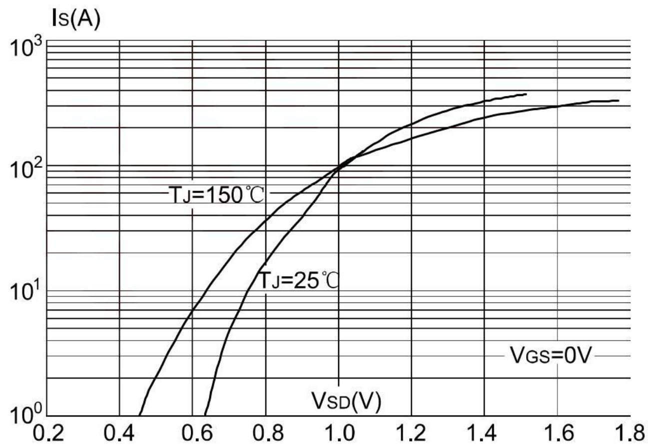


Figure 5: Gate Charge Characteristics

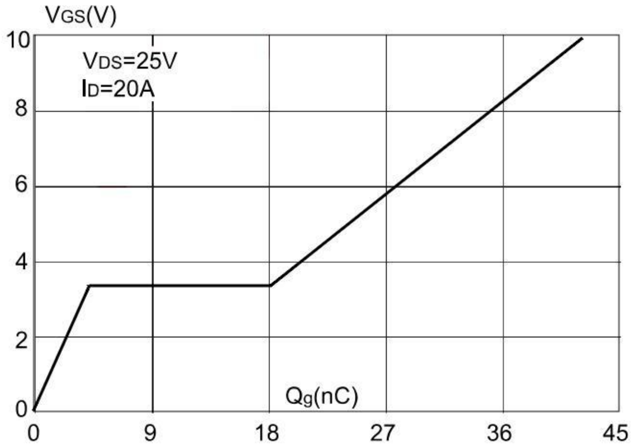
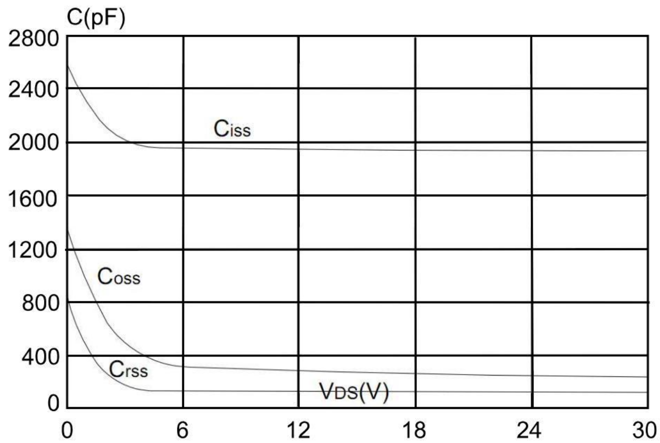


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

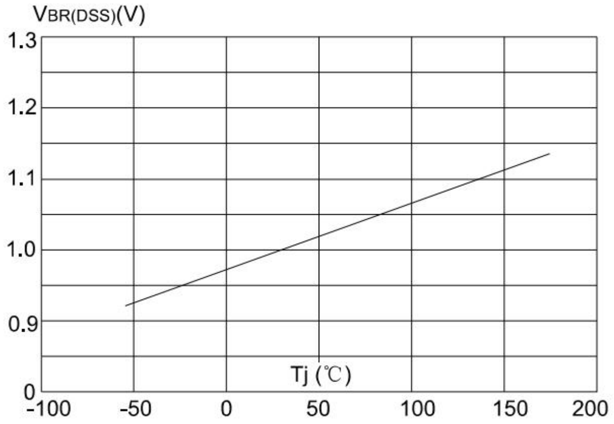


Figure 8: Normalized on Resistance vs. Junction Temperature

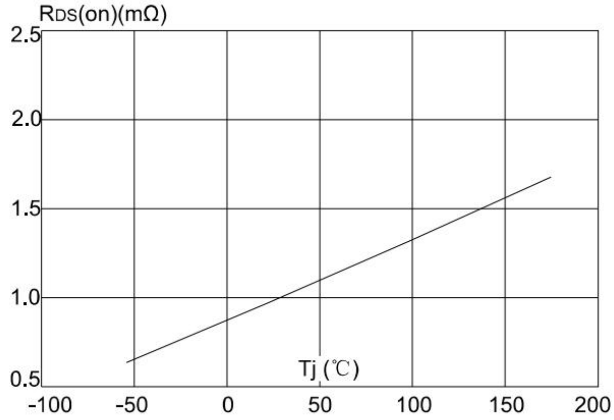


Figure 9: Maximum Continuous Drain Current vs. Case Temperature

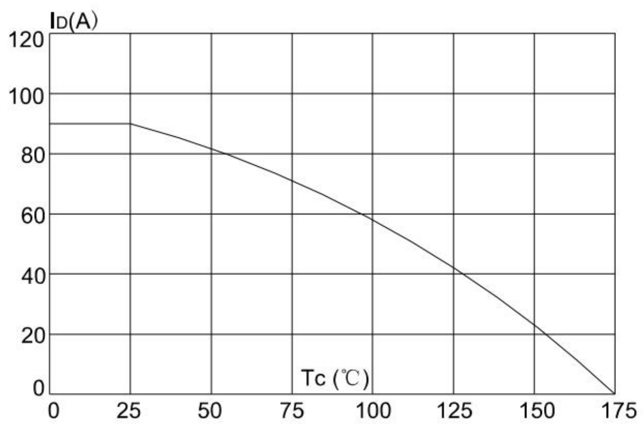
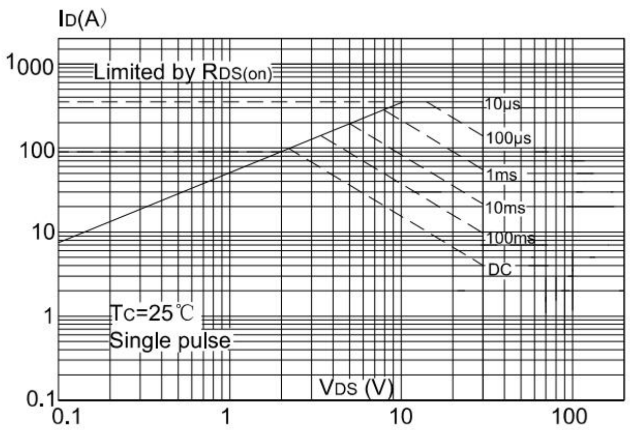
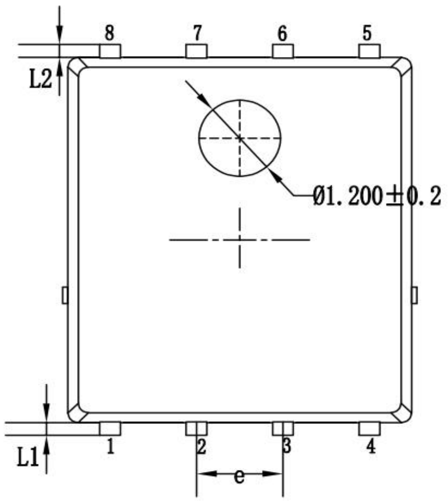
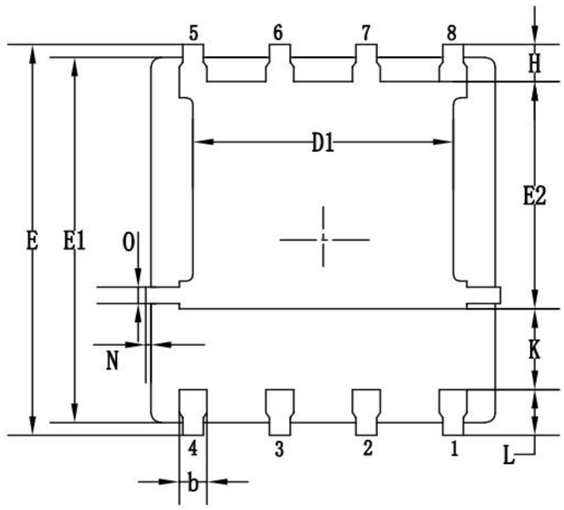


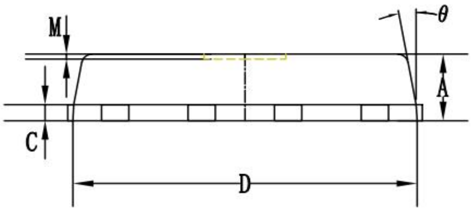
Figure 10: Maximum Safe Operating Area



PDFN5X6 Package Information







Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.34	0.40	0.50
C	0.20	0.25	0.35
D	4.80	5.05	5.20
D1	3.72	3.82	3.92
E	5.95	6.15	6.30
E1	5.60	5.75	5.90
E2	3.47	3.57	3.67
e	1.27 BSC.		
H	0.48	0.58	0.68
K	1.17	1.27	1.37
L	0.64	0.74	0.84
L1/L2	0.20 REF.		
θ	8°	10°	12°
M	0.08 REF.		
N	0	-	0.15
O	0.25 REF.		

Revision History

Revision	Release	Remark
V1.0	2024/03/16	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.

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