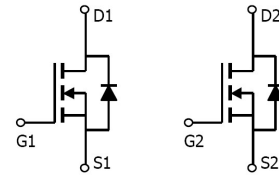
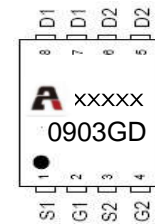


Features

- HEX8-EE
- $r_{DS(on)} < 9.0m\ \Omega @ V_{GS}=10V$ TYP:8.0m Ω
- $R_{DS(on)} < 16m\ \Omega @ V_{GS}=4.5V$ TYP:10.0m Ω
- Advanced Trench technology
- Excellent RDS(ON) and Low Gate Charge
- Fast switching speed



Schematic diagram



Marking and pin assignment

Applications

- Load Switch
- PWM Application
- Power management

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
0903GD	AP0903GD	PDFN5X6-D	-	-	5000

ABSOLUTE MAXIMUM RATINGS (T_J=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current (T _C =25°C)	I _D	40	A
Continuous Drain Current (T _C =100°C)	I _D	28	A
Pulsed Drain Current ⁽¹⁾	I _{DM}	160	A
Single Pulsed Avalanche Energy ⁽²⁾	E _{AS}	100	mJ
Power Dissipation (T _C =25°C)	P _D	30	W
Thermal Resistance from Junction to Case ⁽³⁾	R _{θJC}	4.2	°C/W
Thermal Resistance from Junction to Ambient	R _{θJA}	56	°C/W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-50~ +150	°C

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

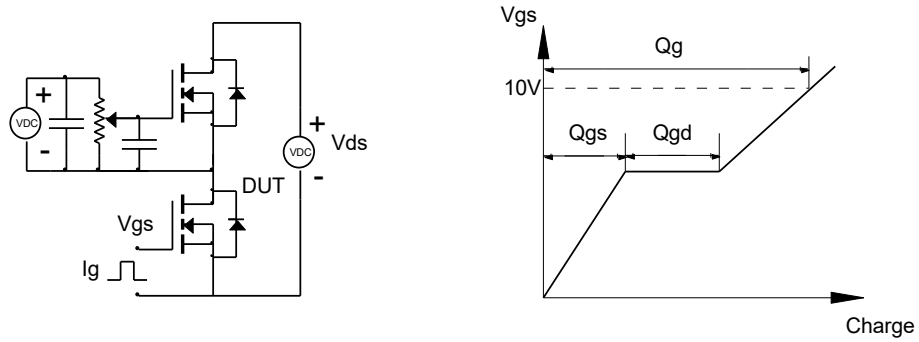
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	30	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V, V _{GS} = 0V, T _J =25°C	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.2	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} =10V, I _D =10A	-	8.0	9.0	mΩ
		V _{GS} =4.5V, I _D =8A		10.0	16.0	
Dynamic characteristics						
Input Capacitance	C _{iSS}	V _{DS} =15V, V _{GS} =0V, f =1.0MHz	-	1010	-	pF
Output Capacitance	C _{oss}		-	215	-	
Reverse Transfer Capacitance	C _{rSS}		-	125	-	
Gate Resistance	R _G	f =1.0MHz		2.5		Ω
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =15V, I _D =1A, R _G =6.0Ω V _{GS} =10V	-	10	-	ns
Turn-on rise time	t _r		-	7	-	
Turn-off delay time	t _{d(off)}		-	24	-	
Turn-off fall time	t _f		-	8	-	
Total Gate Charge	Q _g	V _{DS} =15V, I _D =10A, V _{GS} =10V	-	14	-	nC
Gate-Source Charge	Q _{gs}		-	1.7	-	
Gate-Drain Charge	Q _{gd}		-	5.0	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	T _J =25°C, V _{GS} =0V, I _S =1.7A	-	-	1.2	V
Diode Forward current	I _S	T _C =25°C	-	-	40	A
Body Diode Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =10A, di/dt=100A/us		27		ns
Body Diode Reverse Recovery Charge	Q _{rr}	T _J =25°C, I _F =10A, di/dt=100A/us		20		uc

Notes:

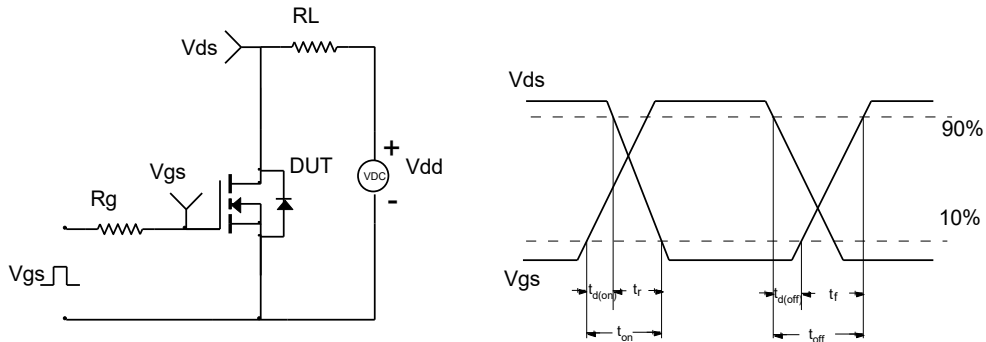
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25°C, V_{DD}=15V, V_G=10V, R_G=25Ω, L=0.5mH I_{AS}=20A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Test Circuit

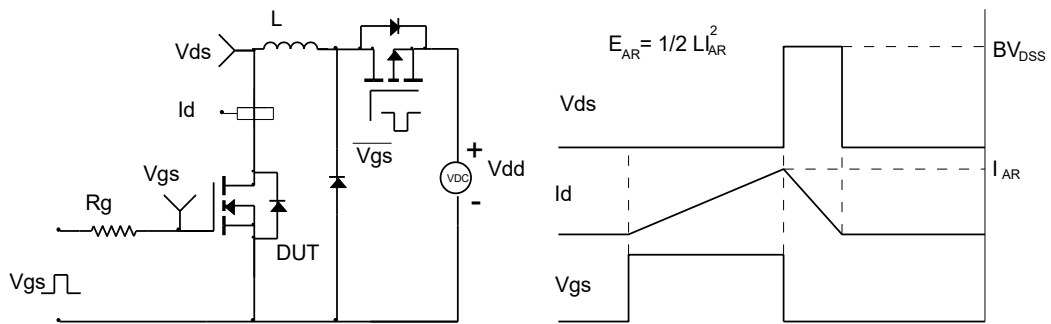
Gate Charge Test Circuit & Waveform



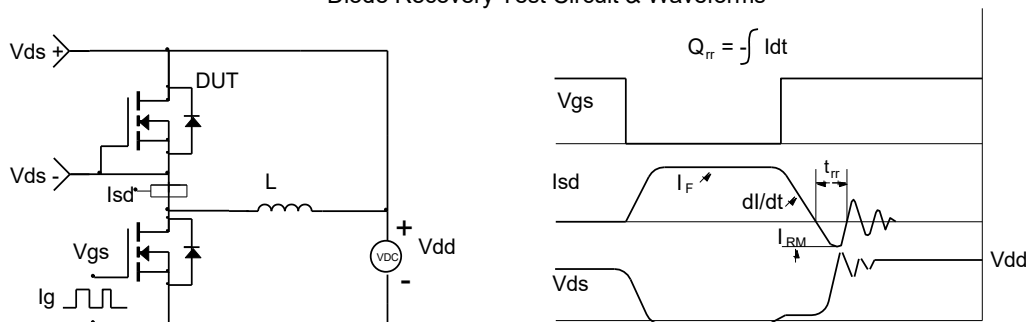
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Electrical and Thermal Characteristics

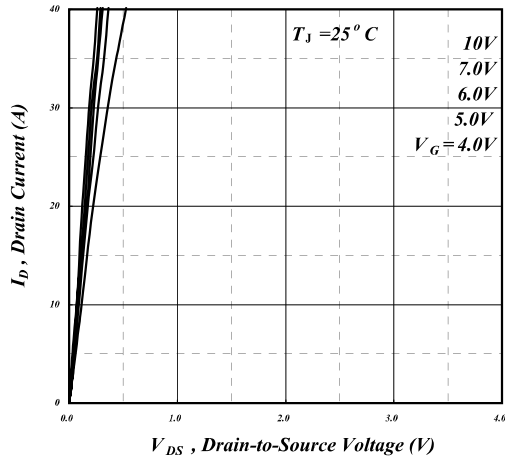


Fig 1. Typical Output Characteristics

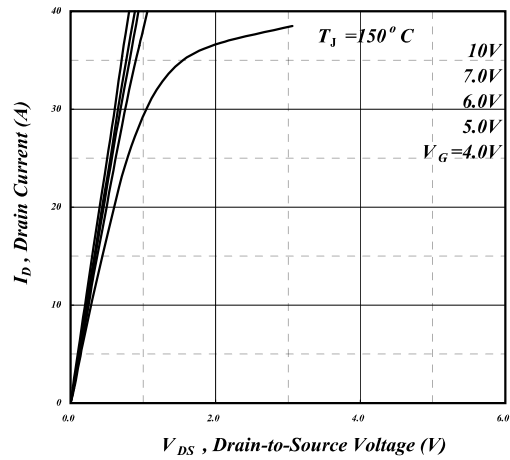


Fig 2. Typical Output Characteristics

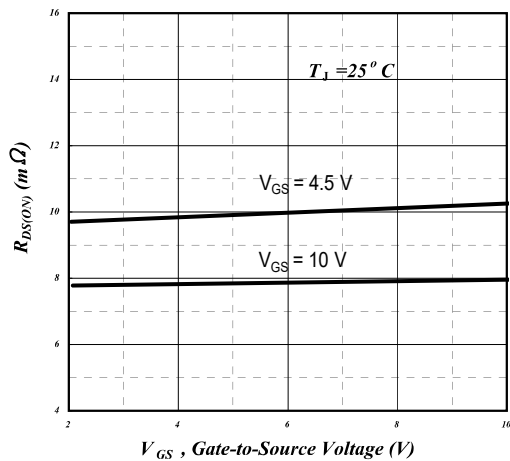


Fig 3. On-Resistance v.s. Gate Voltage

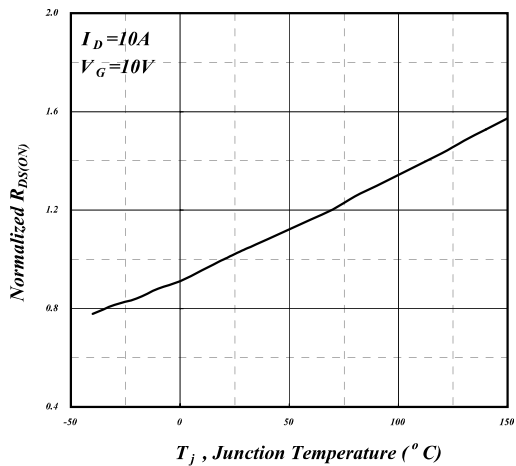


Fig 4. Normalized On-Resistance v.s. Junction Temperature

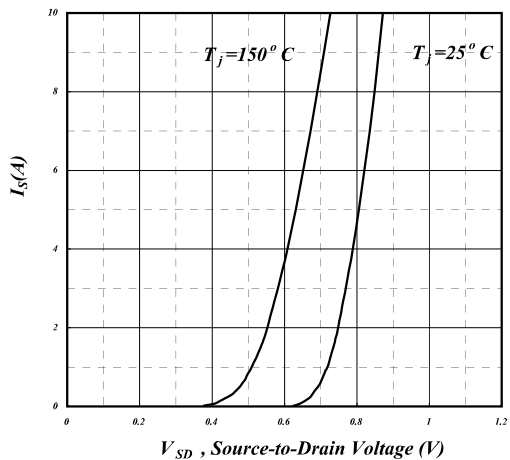


Fig 5. Forward Characteristic of Reverse Diode

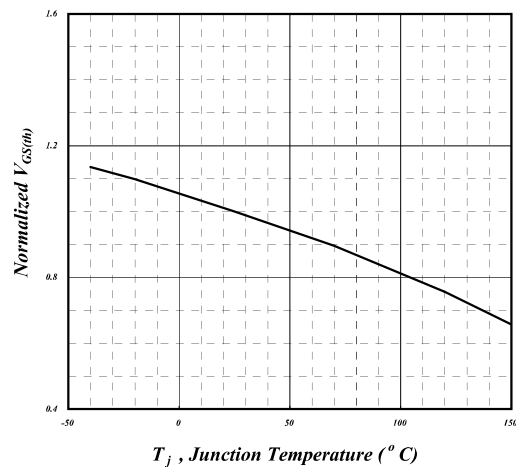


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Typical Electrical and Thermal Characteristics

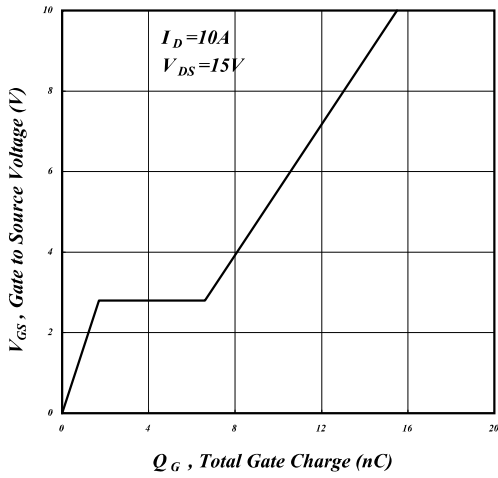


Fig 7. Gate Charge Characteristics

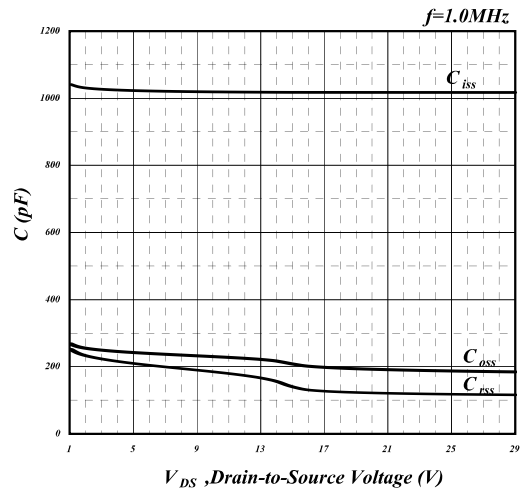


Fig 8. Typical Capacitance Characteristics

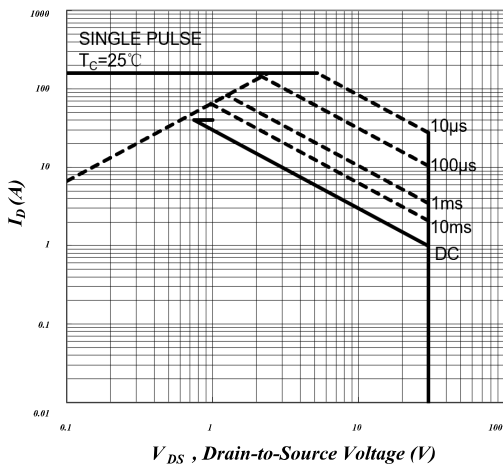


Fig 9. Maximum Safe Operating Area

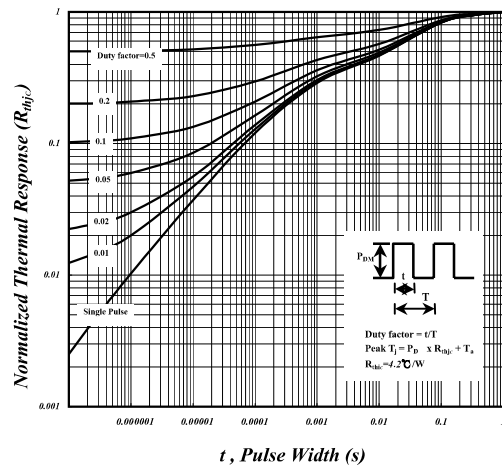
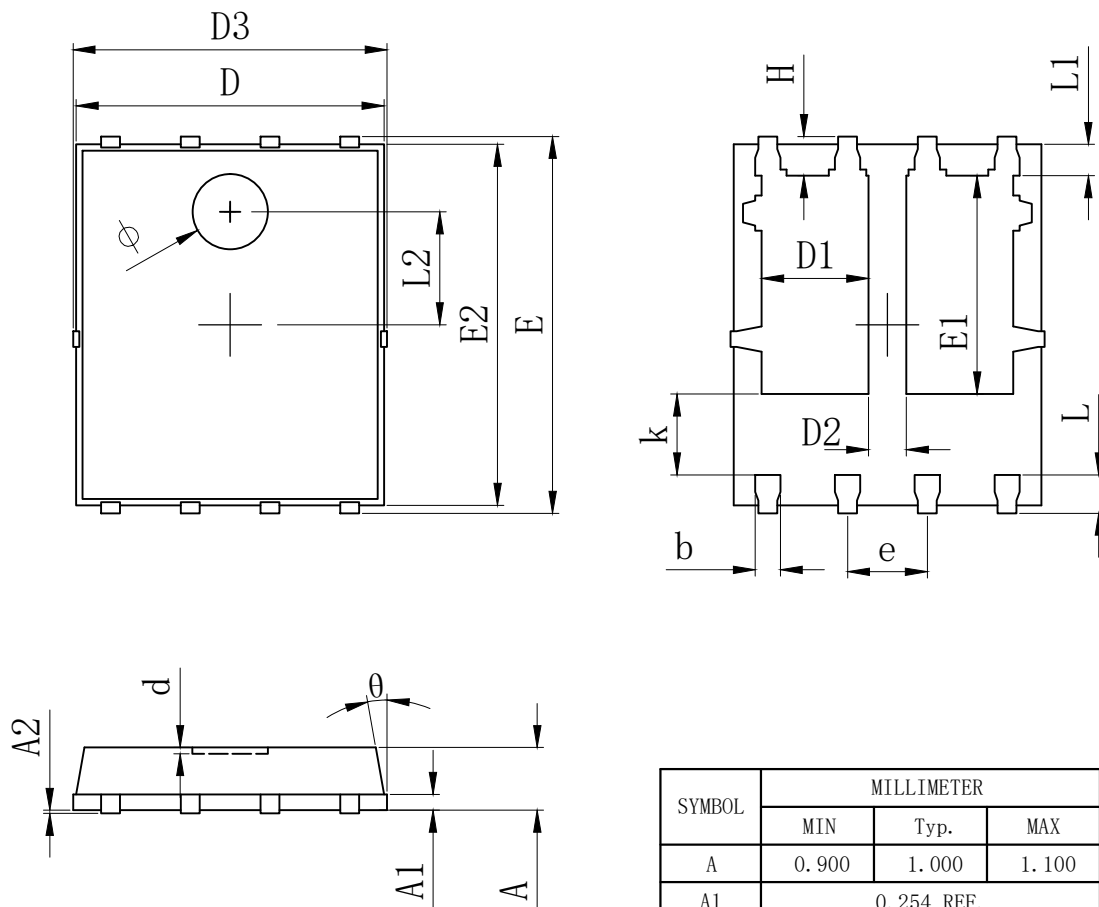


Fig 10. Maximum Transient Thermal Impedance

PDFN5X6-D Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0 [~] 0.05		
D	4.824	4.900	4.976
D1	1.605	1.705	1.805
D2	0.500	0.600	0.700
D3	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
ϕ	1.100	1.200	1.300
d			0.100

Revision History

Revision	Release	Remark
V1.0	2023/04/19	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.