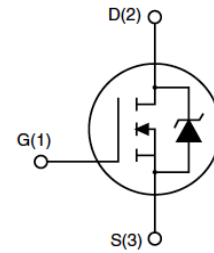


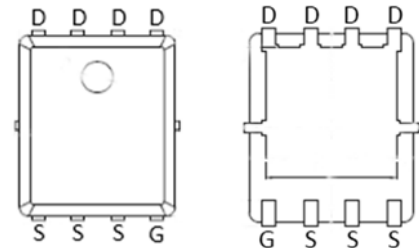
## Feature

- 40V,150A  
 $R_{DS(ON)} < 2.1\text{m}\Omega @ V_{GS}=10\text{V}$  (TYP:1.6m $\Omega$ )  
 $R_{DS(ON)} < 3.3\text{m}\Omega @ V_{GS}=4.5\text{V}$  (TYP:2.2m $\Omega$ )
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- $T_{jmax}=175^{\circ}\text{C}$
- AEC-Q101 qualified



## Application

- PWM applications
- Load Switch
- Power management



PDFN5X6

## Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G4015G	APG4015G-AU	PDFN5X6	13 inch	-	5000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_c=25^{\circ}\text{C}$ )	$I_D$	150	A
Continuous Drain Current ( $T_c=100^{\circ}\text{C}$ )	$I_D$	100	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	400	A
Single Pulsed Avalanche Energy <sup>(2)</sup>	$E_{AS}$	320	mJ
Power Dissipation	$P_D$	89	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.4	$^{\circ}\text{C}/\text{W}$
Thermal Resistance- Junction to Ambient	$R_{\theta JA}$	47	$^{\circ}\text{C}/\text{W}$
Junction Temperature	$T_J$	175	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55~ +175	$^{\circ}\text{C}$

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

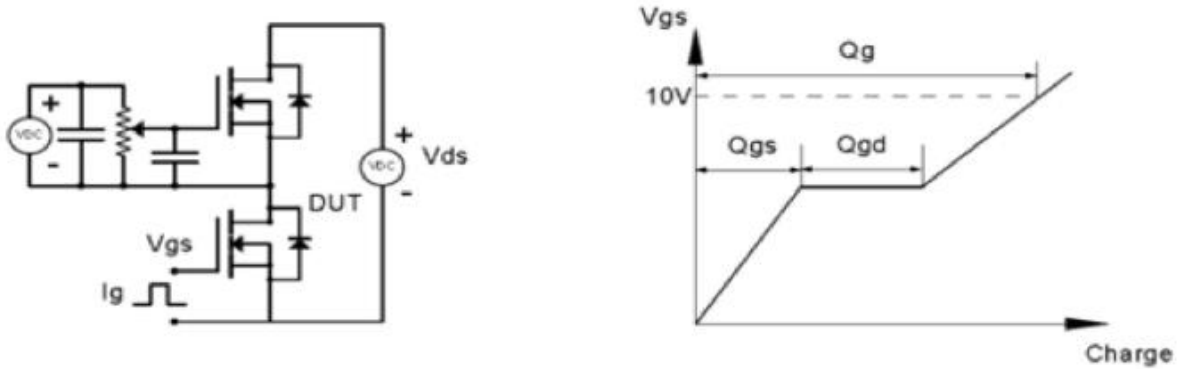
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Gate threshold voltage <sup>(3)</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.7	2.5	V
Drain-source on-resistance <sup>(3)</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 75A$	-	1.6	2.1	m $\Omega$
		$V_{GS} = 4.5V, I_D = 30A$	-	2.2	3.3	
Forward Threshold Voltage	$g_{fs}$	$V_{DS} = 5V, I_D = 75A$	60	-	-	S
Gate Resistance	$R_g$	$V_{DS} = V_{GS} = 0V, f = 1MHz$	-	1.94	-	$\Omega$
<b>Dynamic characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$	-	3000	-	pF
Output Capacitance	$C_{oss}$		-	895	-	
Reverse Transfer Capacitance	$C_{rss}$		-	37	-	
<b>Switching characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V, I_D = 75A,$ $V_{GS} = 10V, R_G = 3\Omega$	-	13	-	ns
Turn-on rise time	$t_r$		-	3	-	
Turn-off delay time	$t_{d(off)}$		-	52	-	
Turn-off fall time	$t_f$		-	24	-	
Total Gate Charge	$Q_g$	$V_{DS} = 20V, I_D = 75A,$ $V_{GS} = 10V$	-	40	-	nC
Gate-Source Charge	$Q_{gs}$		-	8	-	
Gate-Drain Charge	$Q_{gd}$		-	7	-	
Reverse Recovery Charge	$Q_{rr}$	$I_F = 50A, di/dt = 100A/\mu s$		31		nC
Reverse Recovery Time	$T_{rr}$	$I_F = 50A, di/dt = 100A/\mu s$		35		ns
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(3)</sup>	$V_{DS}$	$V_{GS} = 0V, I_S = 75A$	-	-	1.2	V
Diode Forward current <sup>(4)</sup>	$I_S$		-	-	150	A

**Notes:**

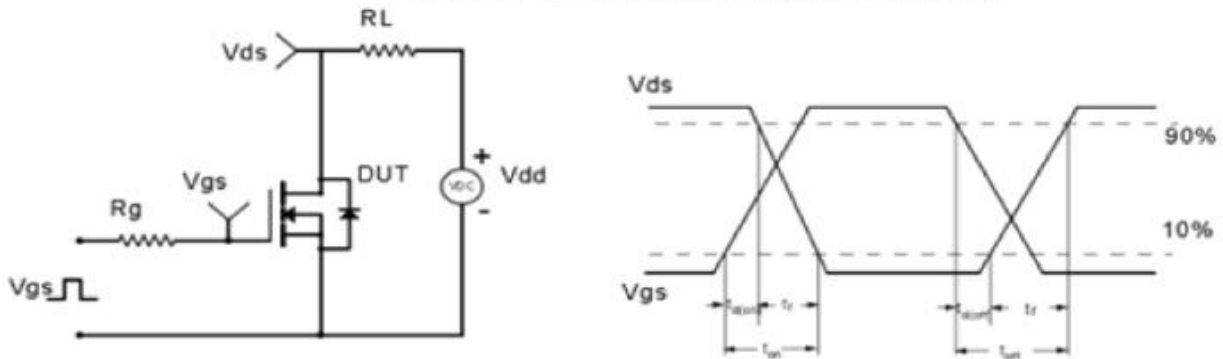
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:  $T_J = 25^\circ\text{C}, V_{DD} = 20V, R_G = 25\Omega, L = 0.5mH$
3. Pulse Test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
4. Surface Mounted on FR4 Board,  $t \leq 10$  sec

**Test Circuit & Waveform**

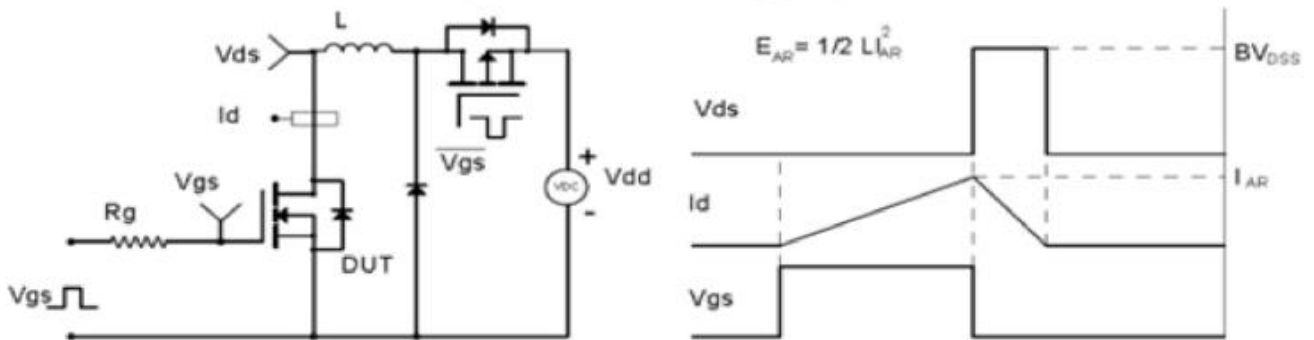
Gate Charge Test Circuit & Waveform



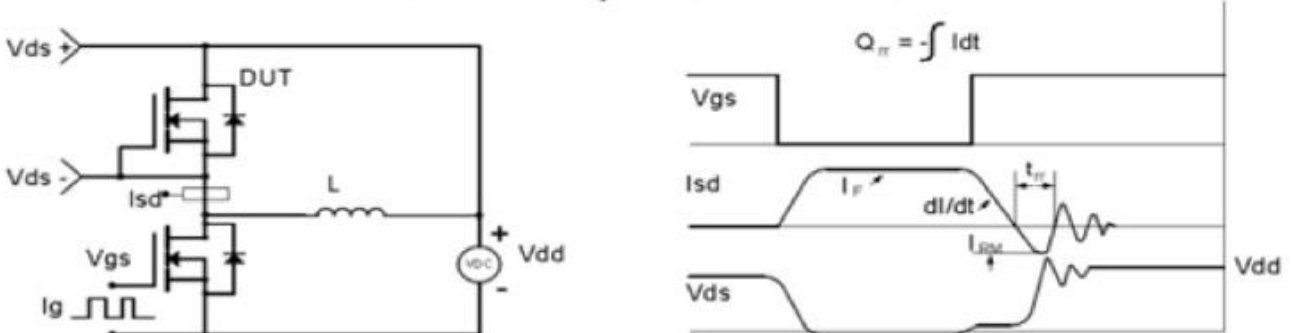
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



**Typical Performance Characteristics**

Fig.1 Power Dissipation Derating Curve

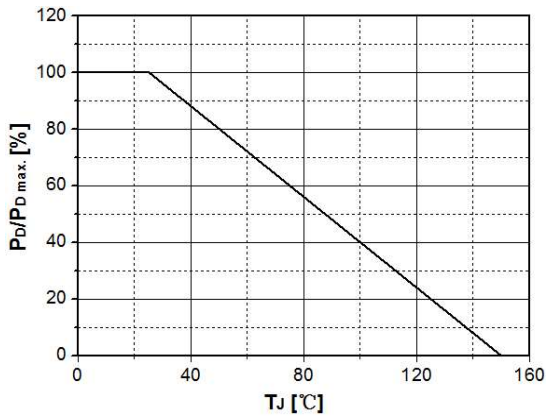


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

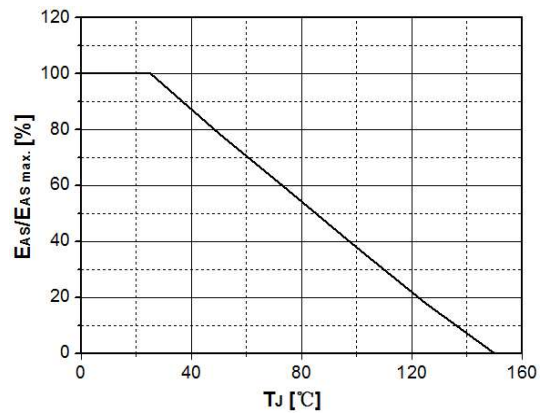


Fig.3 Typical Output Characteristics

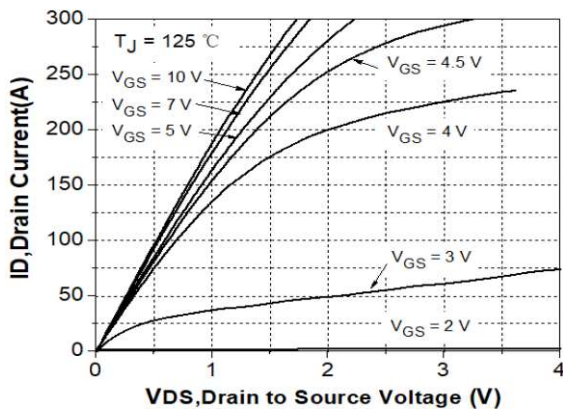


Fig. 4 Transconductance vs. Drain Current

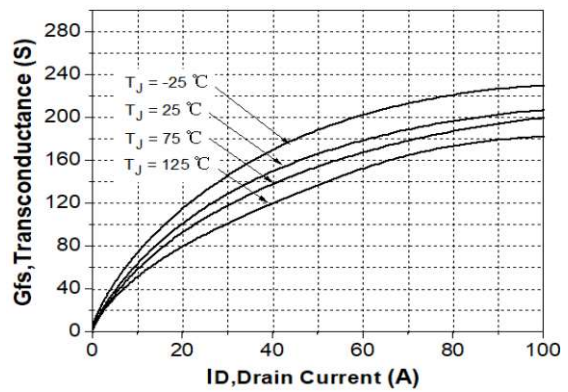


Fig.5 Typical Transfer Characteristics

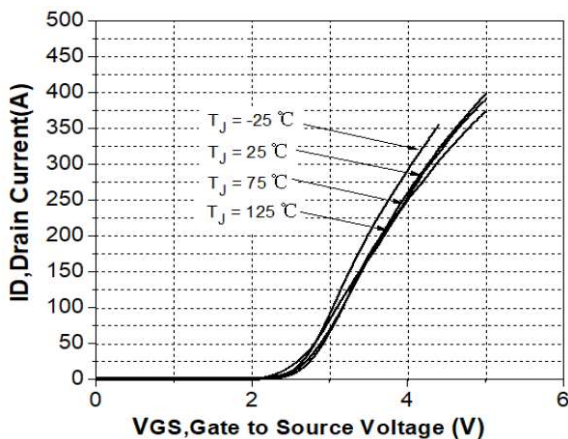


Fig. 6 On-Resistance vs. Drain Current @-25°C

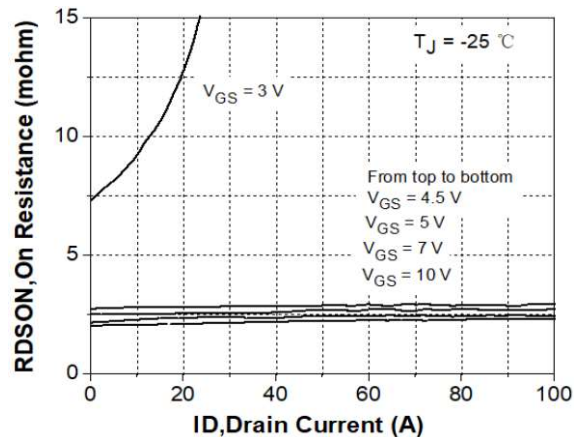


Fig.7 On-Resistance vs. Drain Current @25°C

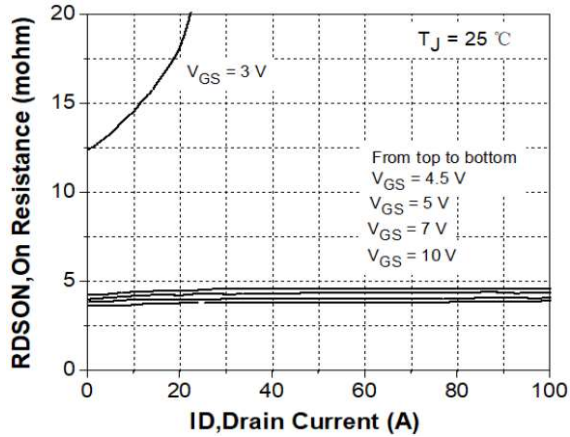


Fig. 8 On-Resistance vs. Drain Current @125°C

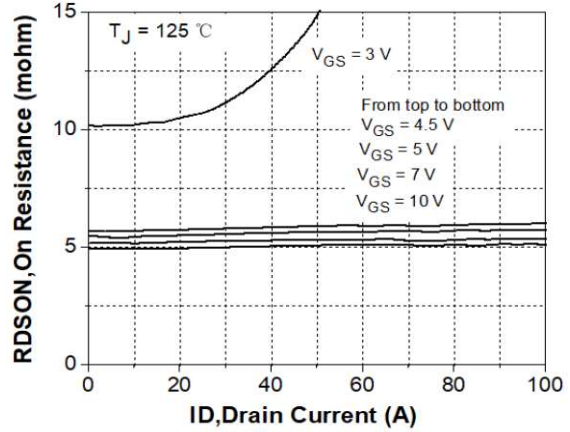


Fig.9 Typical Capacitance vs. Drain Source Voltage

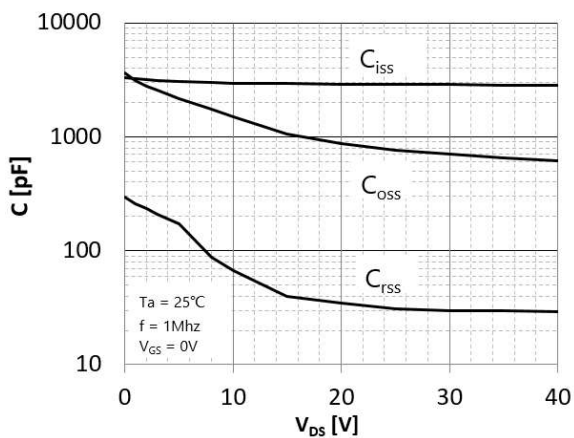


Fig.10 Dynamic Input Characteristics

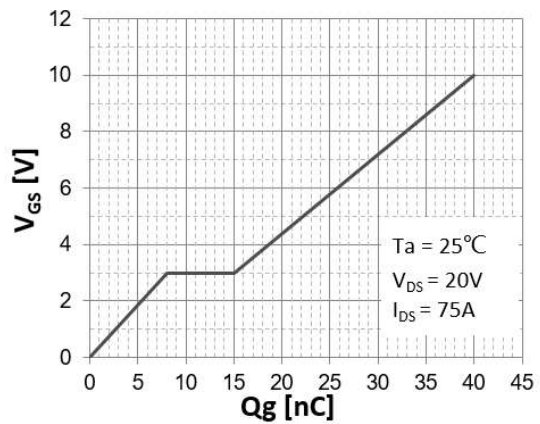


Fig.11 Breakdown Voltage vs. Junction Temperature

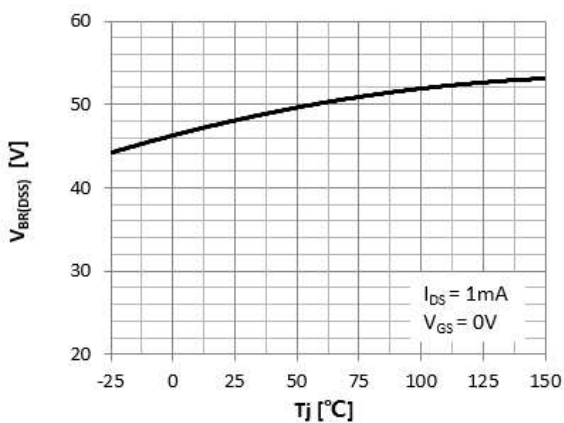
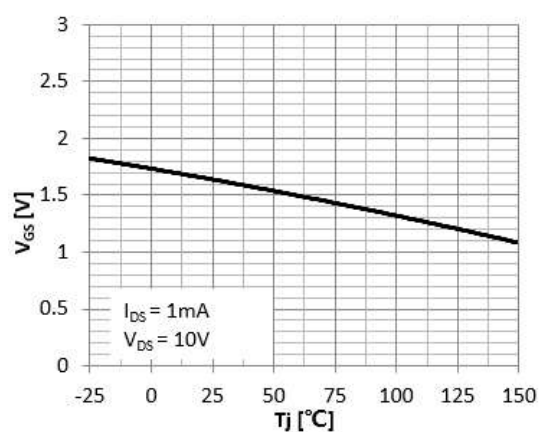
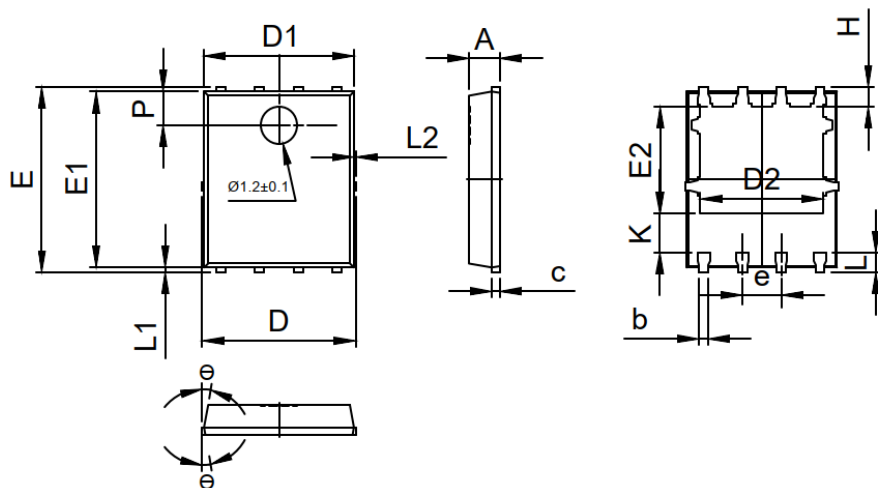


Fig. 12 Gate Threshold Voltage vs. Junction Temperature



**PDFN5X6 Package Information**



SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.25	0.30	0.35
c	0.21	0.25	0.34
D	-	-	5.10
D1	4.80	4.90	5.00
D2	3.91	4.01	4.11
e	1.27 BSC		
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.375	3.475	3.575
H	0.55	0.65	0.75
K	1.20	-	-
L	0.55	0.65	0.75
L1	0.05	0.15	0.25
L2	-	-	0.12
$\Theta$	8°	10°	12°
P	1.00	1.10	1.20