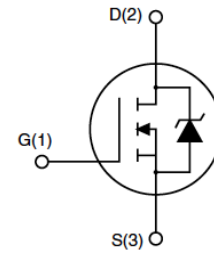


# APG4018G

## N-Channel Enhancement Mosfet

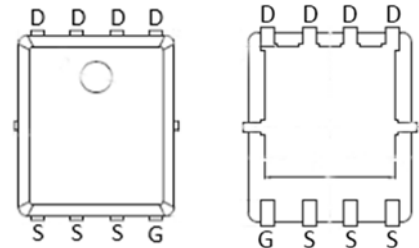
### Features

- 40V,140A  
 $R_{DS(ON)} < 2.4m\Omega @ V_{GS}=10V$  TYP:1.9m $\Omega$   
 $R_{DS(ON)} < 4.0m\Omega @ V_{GS}=4.5V$  TYP:2.6m $\Omega$
- Advanced Split Gate Trench Technology
- Excellent RDS(ON) and Low Gate Charge
- Lead free product



### Applications

- Load Switch
- PWM Application
- Power management



PDFN5X6

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G4018G	APG4018G	PDFN5X6	-	-	5000

### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^{\circ}C$ 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 ( $T_C=25^{\circ}C$ )	$I_D$	140	A
Continuous Drain Current ( $T_C=100^{\circ}C$ )	$I_D$	91	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	560	A
Single Pulsed Avalanche Energy <sup>(2)</sup>	$E_{AS}$	125	mJ
Drain Power Dissipation	$P_D$	83	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.5	$^{\circ}C/W$
Thermal Resistance- Junction to Ambient	$R_{\theta JA}$	50	$^{\circ}C/W$
Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55~ +150	$^{\circ}C$

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

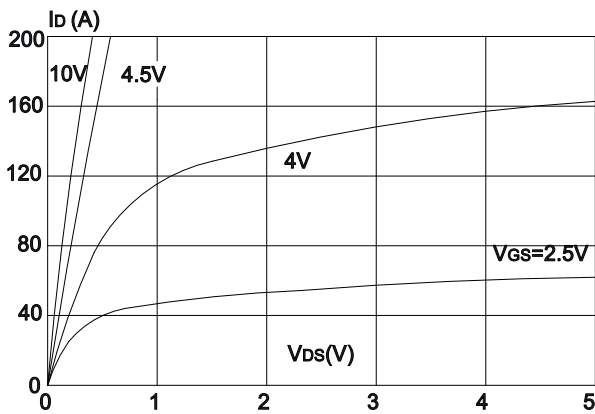
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	-	2.5	V
Drain-source on-resistance <sup>(3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	1.9	2.4	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		2.6	4.0	mΩ
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f =1.0MHz	-	3162	-	pF
Output Capacitance	C <sub>oss</sub>		-	1099	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	157	-	
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =20V, I <sub>D</sub> =75A, R <sub>G</sub> =1.6Ω, R <sub>L</sub> =0.4Ω, V <sub>G</sub> =10V	-	12.5	-	ns
Turn-on rise time	t <sub>r</sub>		-	7	-	
Turn-off delay time	t <sub>d(off)</sub>		-	50	-	
Turn-off fall time	t <sub>f</sub>		-	8.5	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, I <sub>D</sub> =75A, V <sub>GS</sub> =10V	-	95	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	15	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	11	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(a)</sup>	V <sub>SD</sub>	T <sub>C</sub> =25°C, V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1.2	V
Diode Forward current	I <sub>S</sub>	T <sub>C</sub> =25°C	-	-	140	A
Body Diode Reverse Recovery Time	t <sub>rr</sub>	T <sub>C</sub> =25°C, I <sub>F</sub> =140A, di/dt=100A/us		31		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	T <sub>C</sub> =25°C, I <sub>F</sub> =140A, di/dt=100A/us		110		nc

**Notes:**

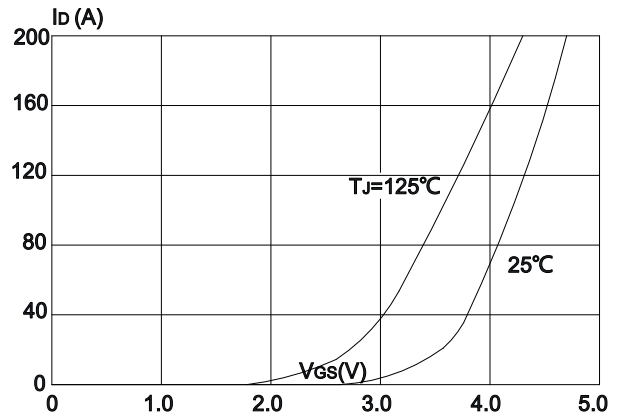
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=20V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=22.4A
3. Pulse Test: Pulse Width≤300μs, Duty Cycles≤0.5%

**Typical Performance Characteristics**

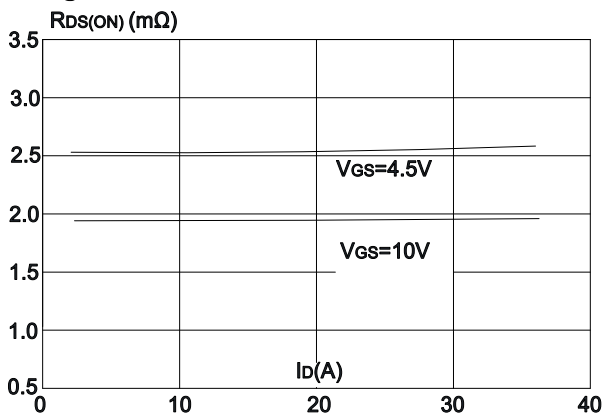
**Figure 1: Output Characteristics**



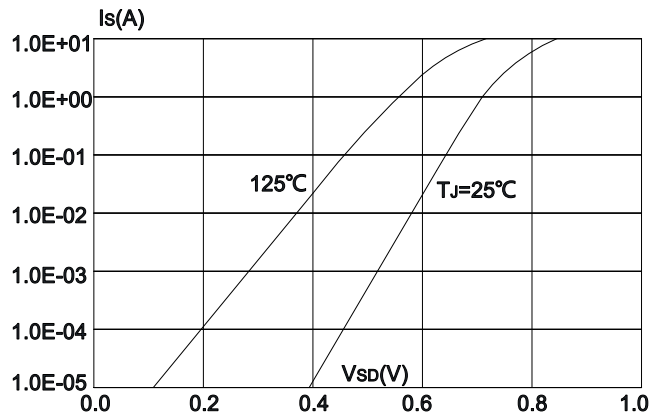
**Figure 2: Typical Transfer Characteristics**



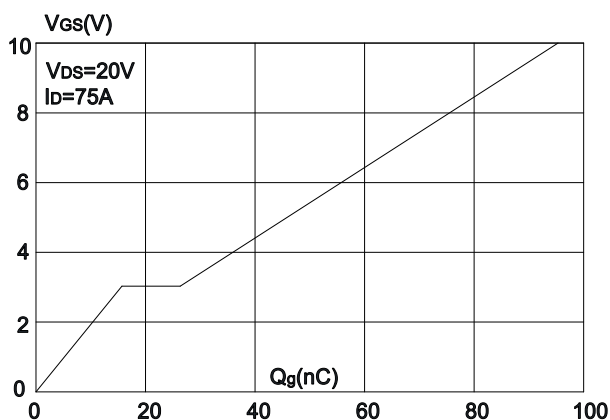
**Figure 3: On-resistance vs. Drain Current**



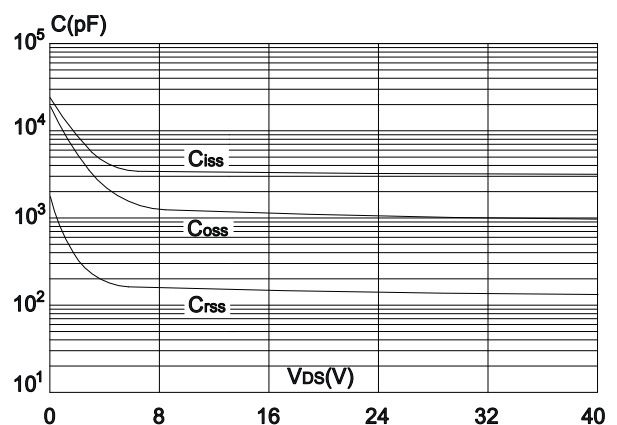
**Figure 4: Body Diode Characteristics**



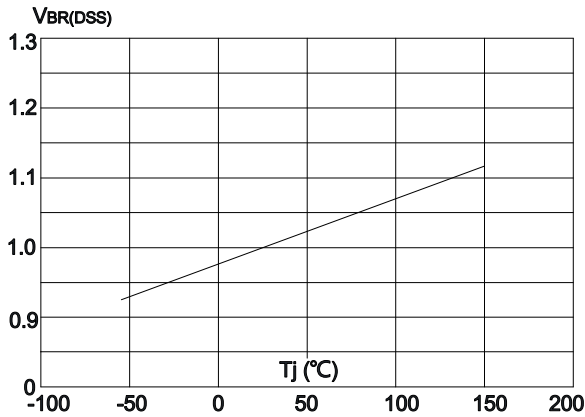
**Figure 5: Gate Charge Characteristics**



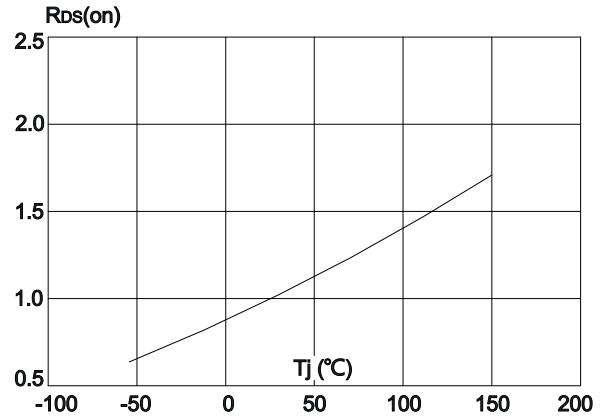
**Figure 6: Capacitance Characteristics**



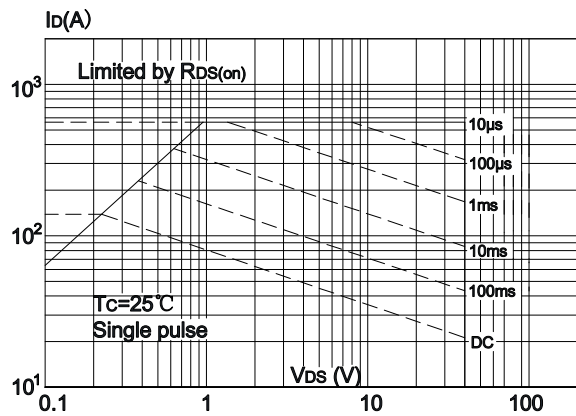
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



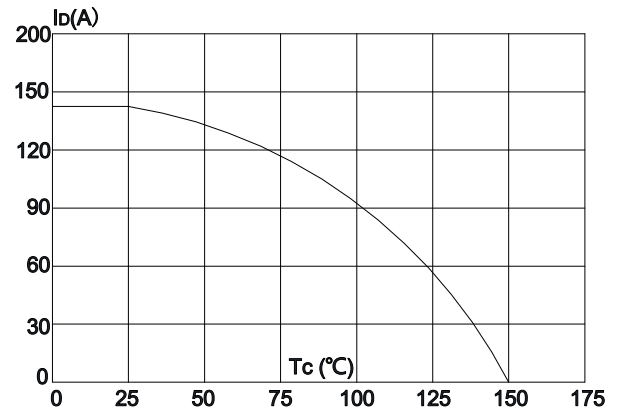
**Figure 8: Normalized on Resistance vs. Junction Temperature**



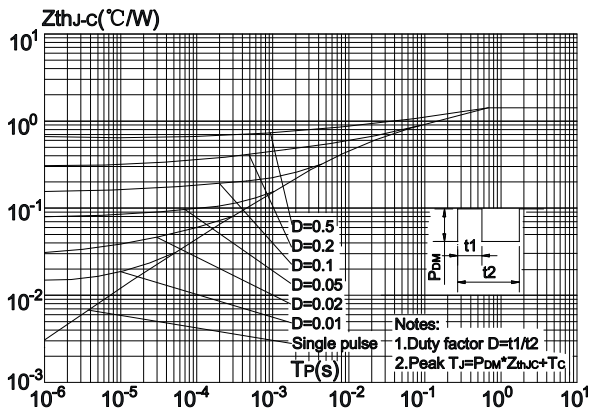
**Figure 9: Maximum Safe Operating Area**



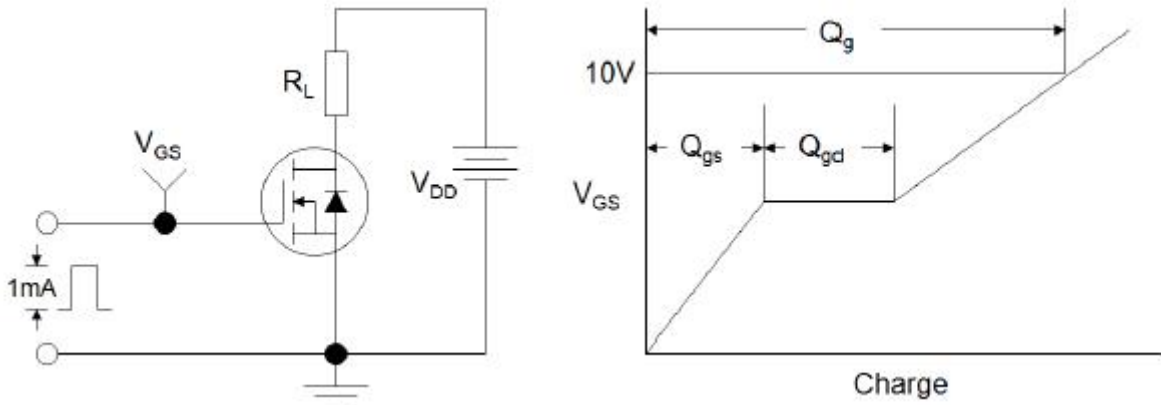
**Figure 10: Maximum Continuous Drain Current vs. Case Temperature**



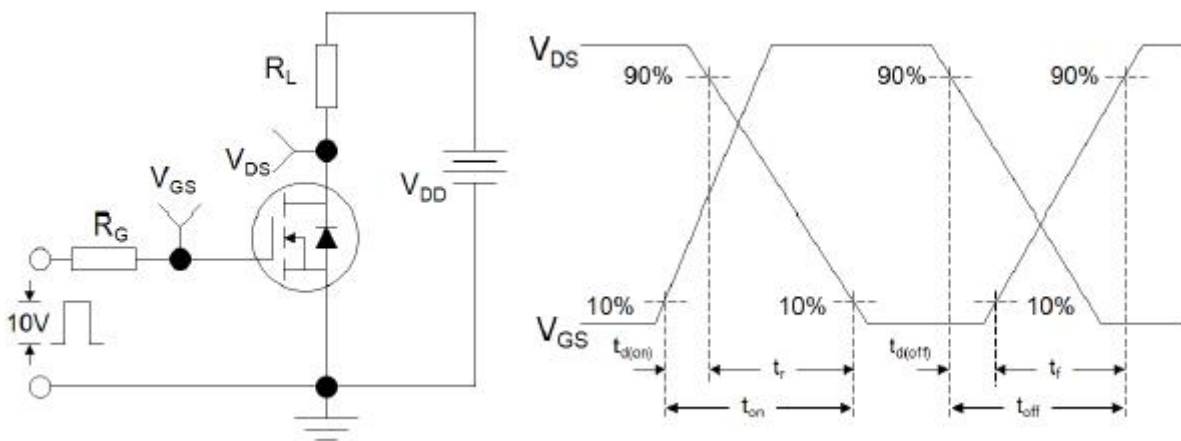
**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**



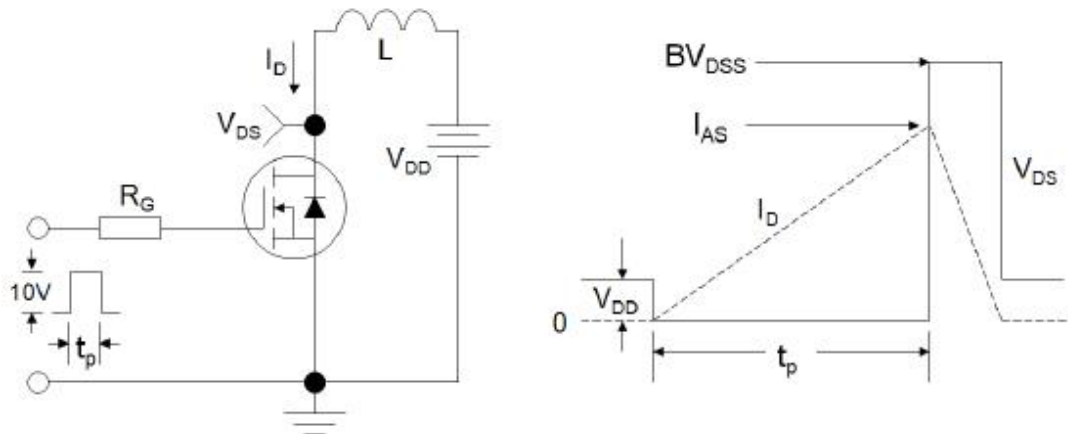
**Test Circuit**



**Figure1:Gate Charge Test Circuit & Waveform**

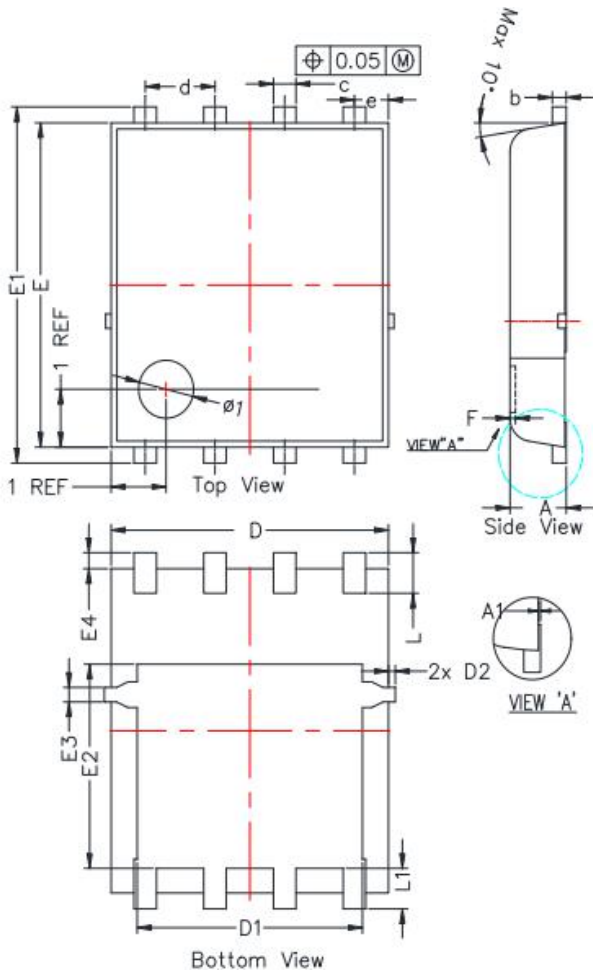


**Figure 2: Resistive Switching Test Circuit & Waveforms**



**Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms**

**Package Mechanical Data-PDFN5x6**



SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
* A	0.900	1.000	1.100	0.035	0.039	0.043
A1	0.000	---	0.050	0.000	----	0.002
b	0.246	0.254	0.312	0.010	0.010	0.012
* c	0.310	0.410	0.510	0.012	0.016	0.020
d	1.27 BSC			0.050 BSC		
* D	4.950	5.050	5.150	0.195	0.199	0.203
D1	4.000	4.100	4.200	0.157	0.161	0.165
* D2	---	---	0.125	---	---	0.005
e	0.62 BSC			0.024 BSC		
* E	5.500	5.600	5.700	0.217	0.220	0.224
* E1	6.050	6.150	6.250	0.238	0.242	0.246
E2	3.425	3.525	3.625	0.135	0.139	0.143
E3	0.150	0.250	0.350	0.006	0.010	0.014
* E4	0.175	0.275	0.375	0.007	0.011	0.015
F	-	-	0.100	-	-	0.004
* L	0.500	0.600	0.700	0.02	0.02	0.03
L1	0.600	0.700	0.800	0.02	0.03	0.03