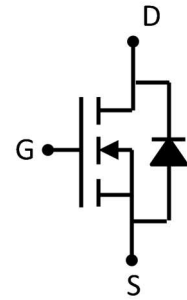


Feature

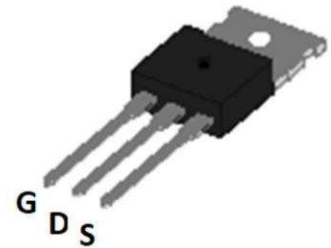
- 85V,135A
 $R_{DS(ON)} < 5m\Omega @ V_{GS}=10V$
- Advanced Trench Power MOSFET
- Provide Excellent $R_{DS(ON)}$ And Low Gate Charge



Schematic diagram

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch
- Rectifier



TO-220C

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G050N85	APG050N85	TO-220C		-	1000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_a = 25^\circ\text{C}$)	I_D	135	A
Continuous Drain Current ($T_a = 100^\circ\text{C}$)	I_D	80	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	260	A
Singel Pulsed Avalanche Energy ⁽²⁾	E_{AS}	238	mJ
Power Dissipation	P_D	196	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.59	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

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

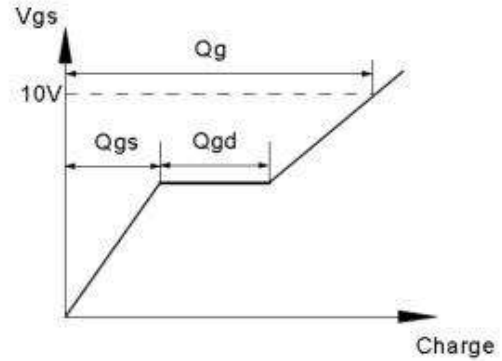
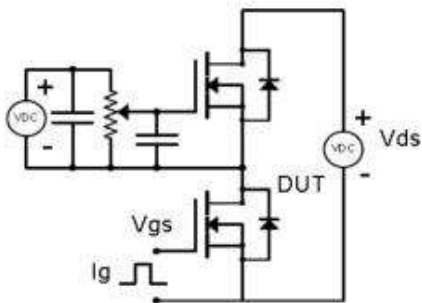
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	85	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =85V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage ⁽³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} =10V, I _D =70A	-	4.5	5	mΩ
Forward tranconductance ⁽³⁾	g _{FS}	V _{DS} =10V, I _D =70A	-	95	-	S
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =40V, V _{GS} =0V, f =1MHz	-	2924	-	pF
Output Capacitance	C _{oss}		-	771	-	
Reverse Transfer Capacitance	C _{rss}		-	15	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =40V, I _D =70A, V _{GS} =10V, R _G =25Ω	-	19	-	ns
Turn-on rise time	t _r		-	33	-	
Turn-off delay time	t _{d(off)}		-	29	-	
Turn-off fall time	t _f		-	19	-	
Total Gate Charge	Q _g	V _{DS} =40V, I _D =70A, V _{GS} =10V	-	48	-	nC
Gate-Source Charge	Q _{gs}		-	13	-	
Gate-Drain Charge	Q _{gd}		-	19	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{DS}	V _{GS} =0V, I _S =120A	-	-	1.2	V
Diode Forward current ⁽⁴⁾	I _S		-	-	135	A
Reverse recovery time	T _{rr}	I _S =60A, V _{GS} =0V, dI _F /dt=100A/us		52		ns
Reverse recovery charge	Q _{rr}	I _S =60A, V _{GS} =0V, dI _F /dt=100A/us		73		nC

Notes:

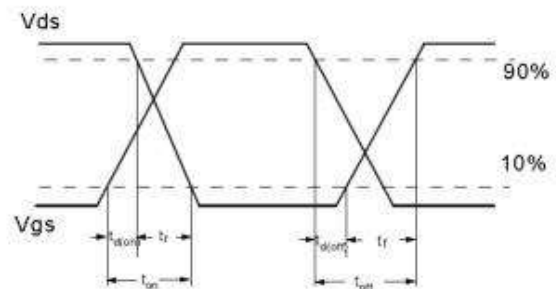
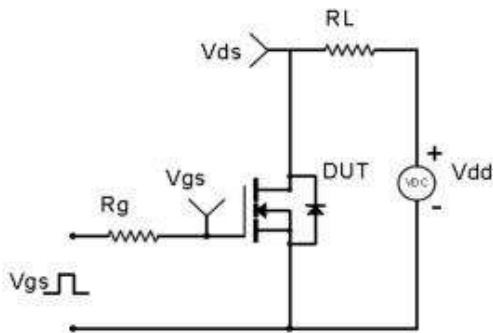
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: T_J=25°C, V_{DD}=10V, R_G=20 Ω, L=0.5mH, I_{AS}=30A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board, t≤10 sec

Test Circuit & Waveform

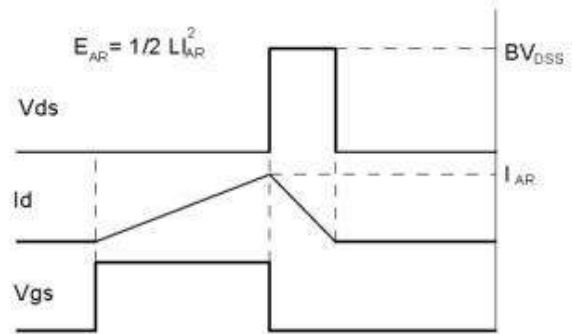
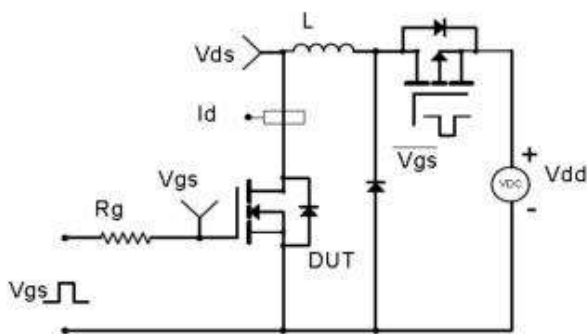
Gate Charge Test Circuit & Waveform



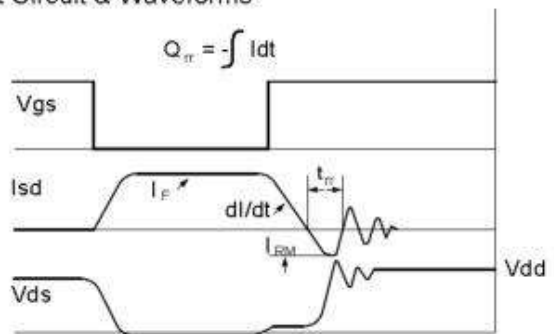
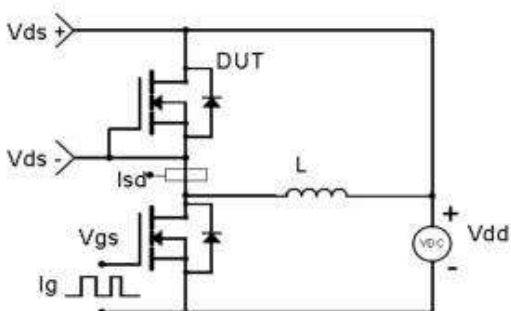
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Electronic and Thermal Characteristics

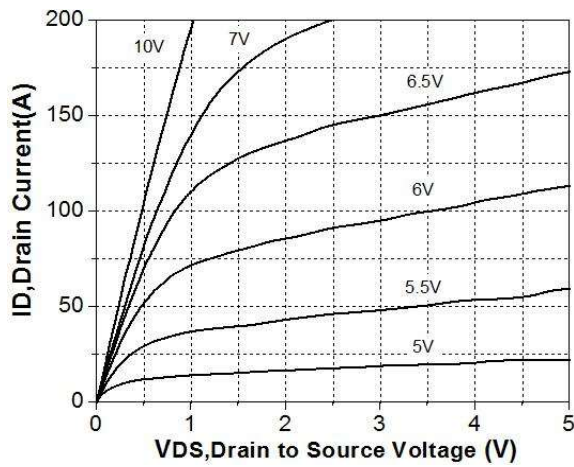


Figure 1. On-Region Characteristics

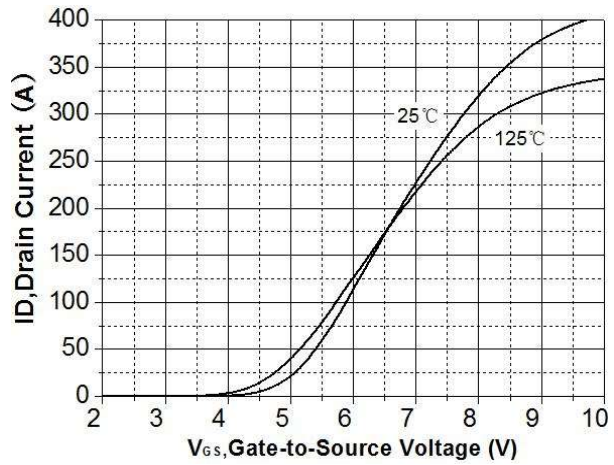


Figure 2. Transfer Characteristics

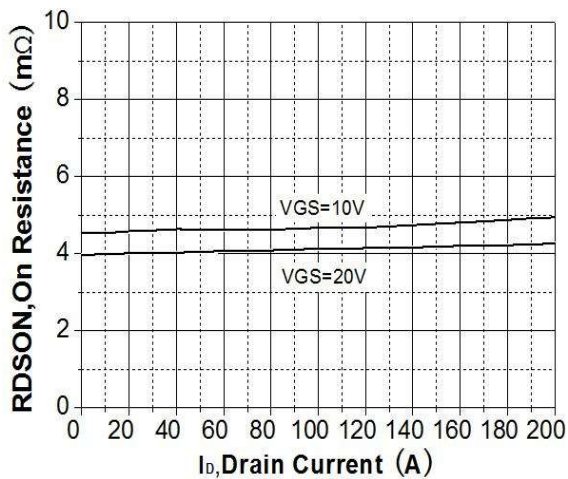


Figure 3. On-Resistance Variation vs Drain Current

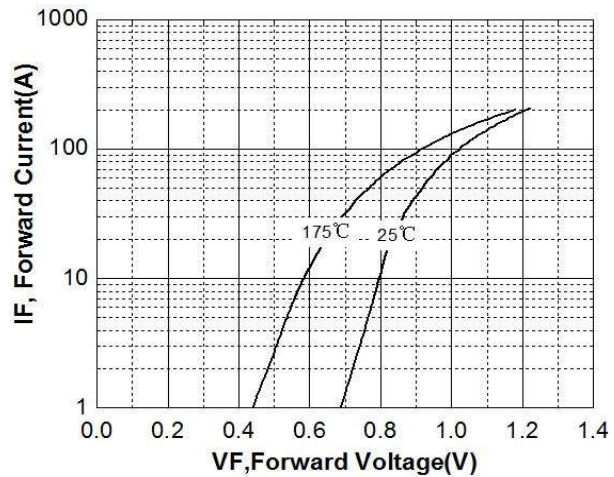


Figure 4. Body Diode Forward Voltage Vs Reverse Drain Current

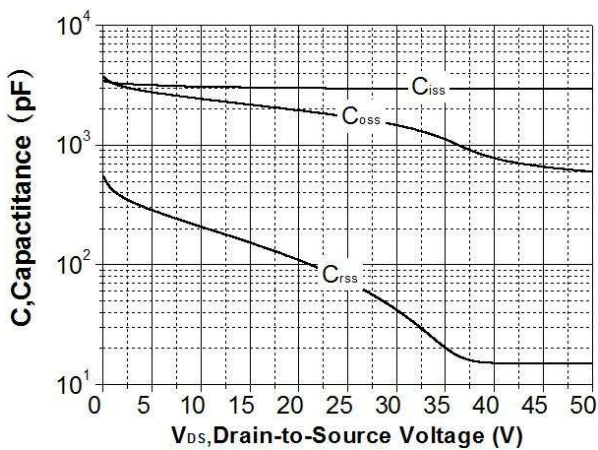


Figure 5. Capacitance Characteristics

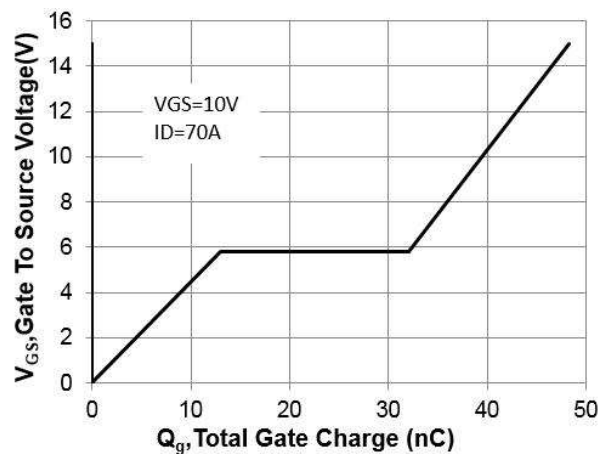


Figure 6. Gate Charge Characteristics

Typical Electronic and Thermal Characteristics

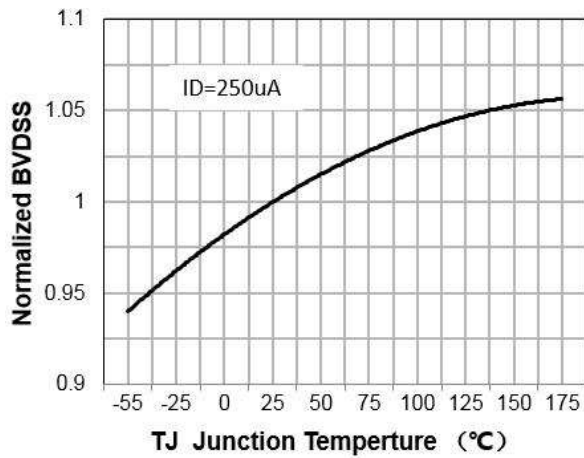


Figure 7. Breakdown Voltage Variation vs Temperature

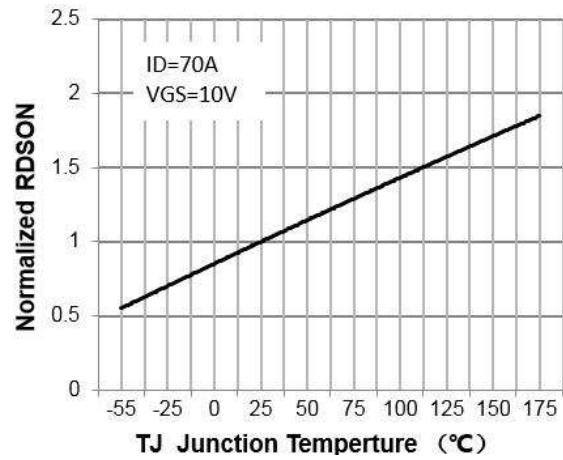


Figure 8. On-Resistance Variation vs Temperature

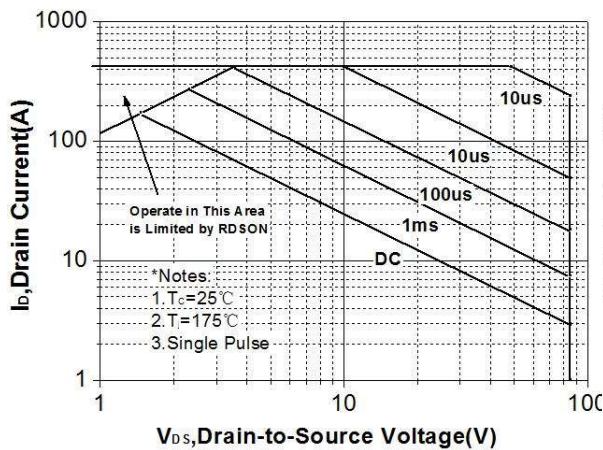


Figure 9. Maximum Safe Operating Area

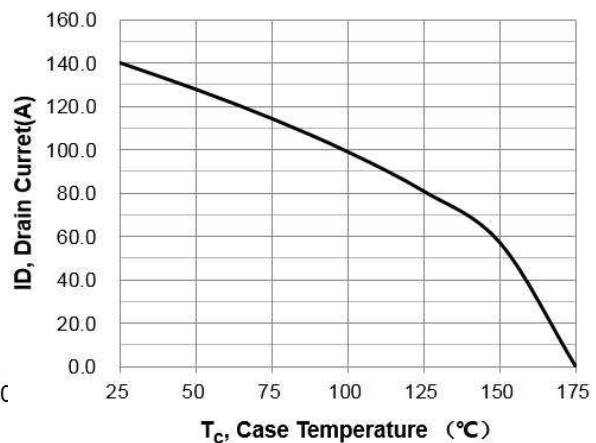


Figure 10. Maximum Drain Current vs Case Temperature

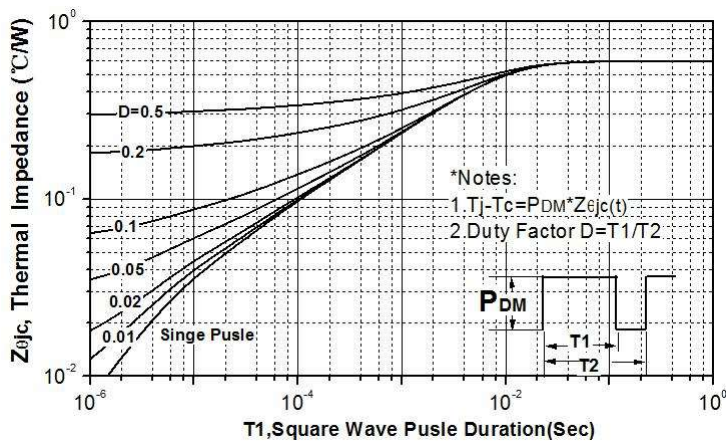
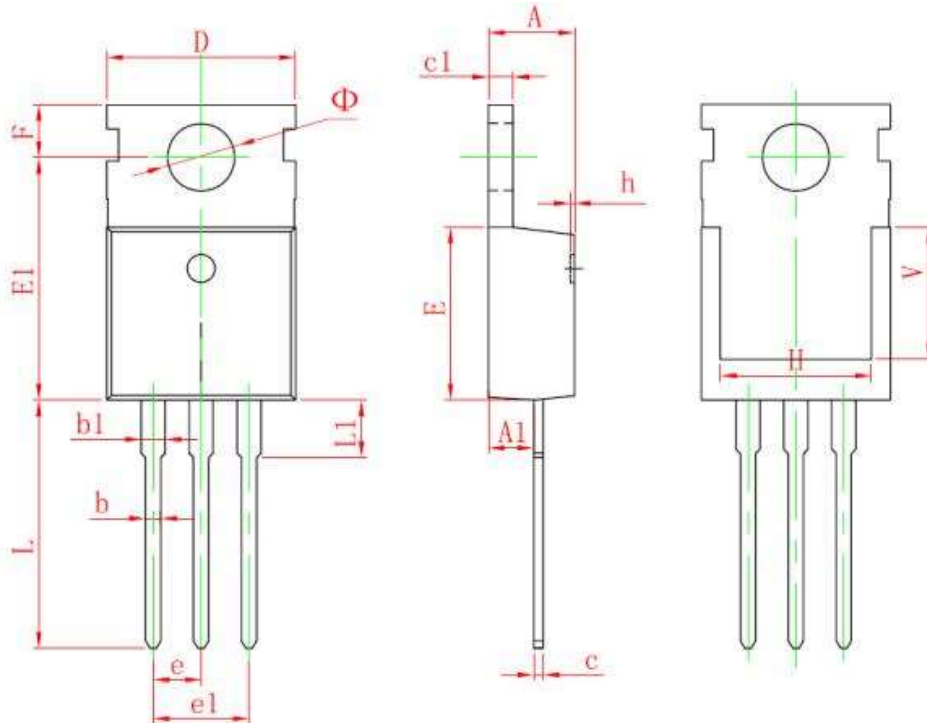


Figure 11. Transient Thermal Response Curve

TO220C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150

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