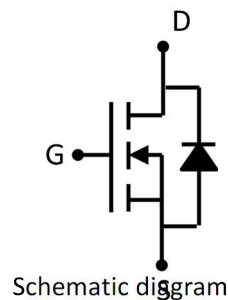


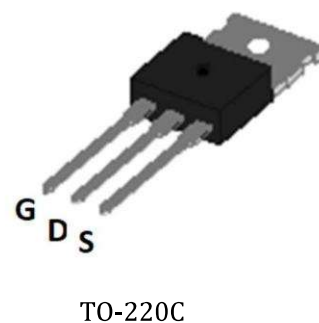
Feature

- 85V,140A
 $R_{DS(ON)} < 5m\Omega @ V_{GS}=10V$
- Advanced Trench Power MOSFET
- Provide Excellent $R_{DS(ON)}$ And Low Gate Charge



Application

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



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G045N85	APG045N85	TO-220C		-	1000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_a=25^{\circ}C$)	I_D	140	A
Continuous Drain Current ($T_a=100^{\circ}C$)	I_D	99	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	280	A
Singel Pulsed Avalanche Energy ⁽²⁾	E_{AS}	263	mJ
Power Dissipation	P_D	200	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.51	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

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

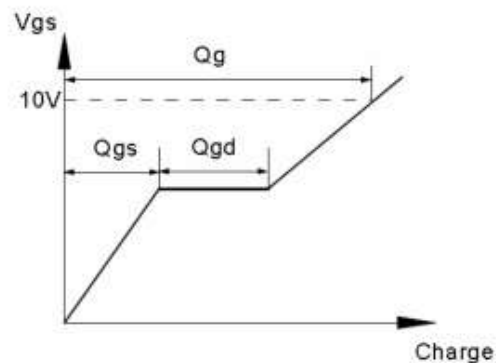
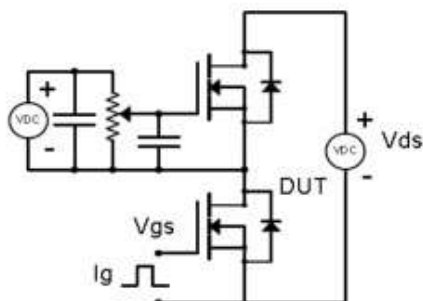
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	85	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =85V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ± 20V, V _{DS} = 0V	-	-	±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	-	4.2	5	mΩ
Forward tranconductance ⁽³⁾	g _{FS}	V _{DS} =10V, I _D =70A	-	128	-	S
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =40V, V _{GS} =0V, f =1MHz	-	3300	-	pF
Output Capacitance	C _{oss}		-	819	-	
Reverse Transfer Capacitance	C _{rss}		-	9	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =40V, I _D =70A, V _{GS} =10V, R _G =25Ω	-	18	-	ns
Turn-on rise time	t _r		-	32	-	
Turn-off delay time	t _{d(off)}		-	37	-	
Turn-off fall time	t _f		-	18	-	
Total Gate Charge	Q _g	V _D S=40V, I _D =70A, V _G S=10V	-	48.5	-	nC
Gate-Source Charge	Q _{gs}		-	2	-	
Gate-Drain Charge	Q _{gd}		-	32	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{DS}	V _{GS} =0V, I _S =70A	-	-	1.2	V
Diode Forward current ⁽⁴⁾	I _S		-	-	140	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		68		nC

Notes:

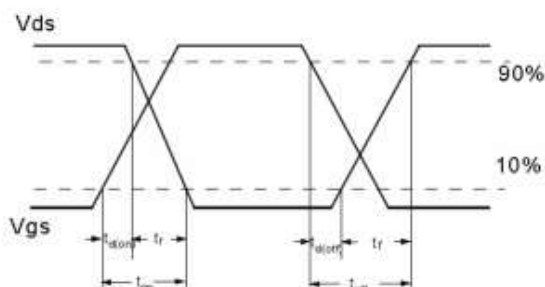
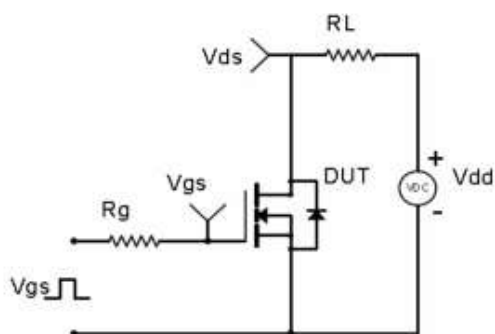
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: $T_J = 25^{\circ}\text{C}$, $V_{DD} = 10V$, $R_G = 20\Omega$, $L = 0.5mH$, $I_{AS} = 32.5A$
3. Pulse Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. Surface Mounted on FR4 Board, $t \leq 10$ sec

Test Circuit & Waveform

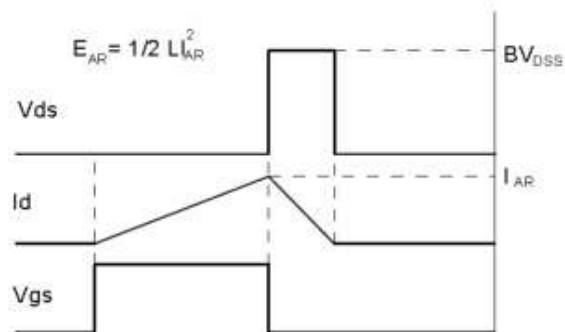
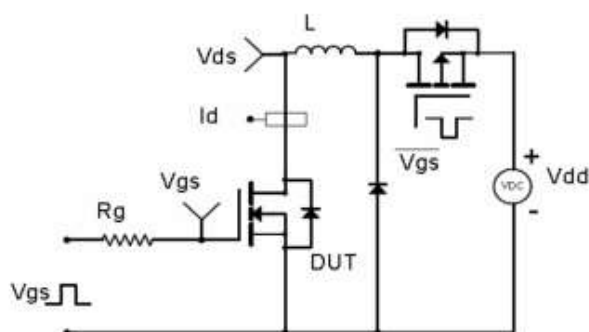
Gate Charge Test Circuit & Waveform



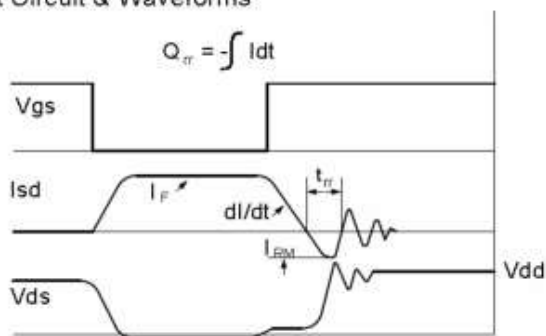
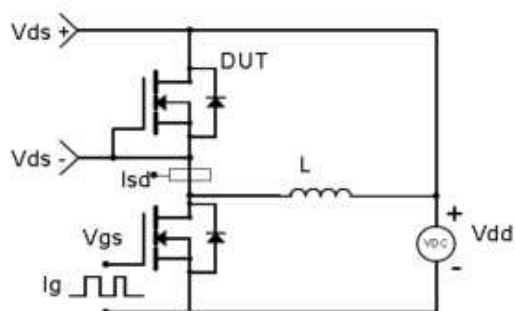
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Electrical and Thermal Characteristics

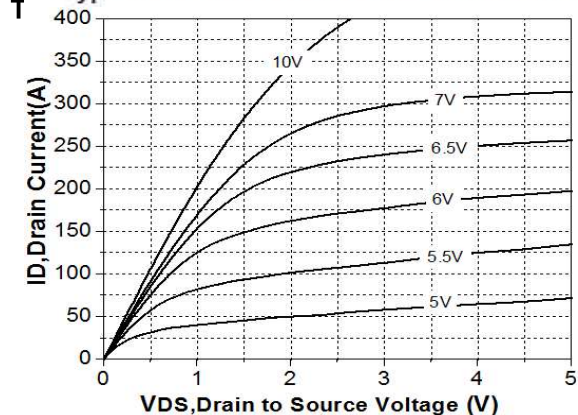


Figure 1 Output Characteristics

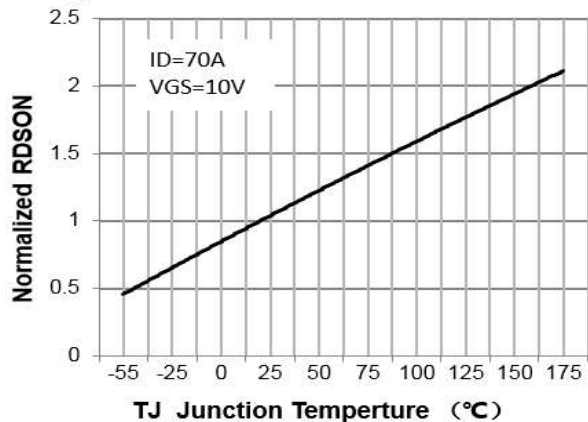


Figure 4 $R_{DS(on)}$ -Junction Temperature

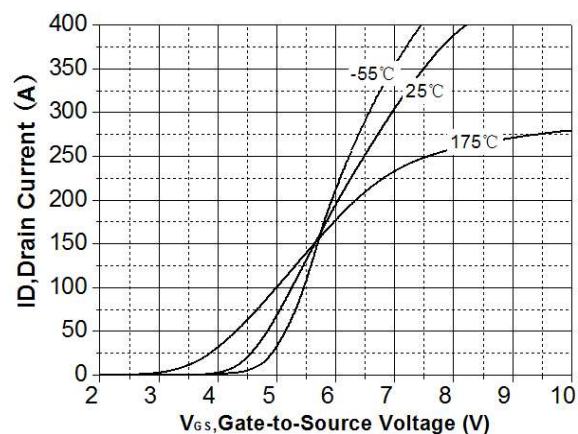


Figure 2 Transfer Characteristics

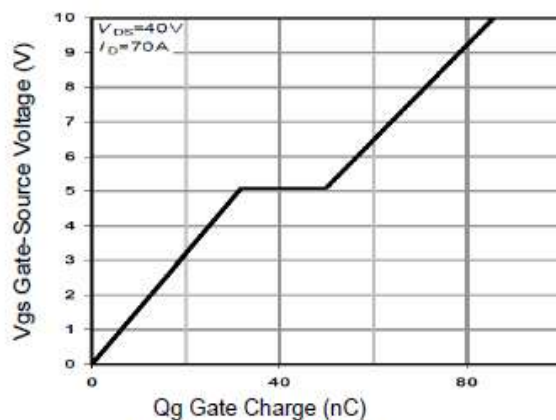


Figure 5 Gate Charge

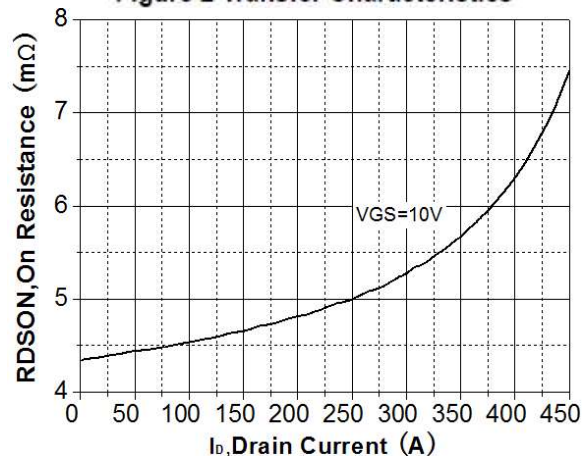


Figure 3 $R_{DS(on)}$ - Drain Current

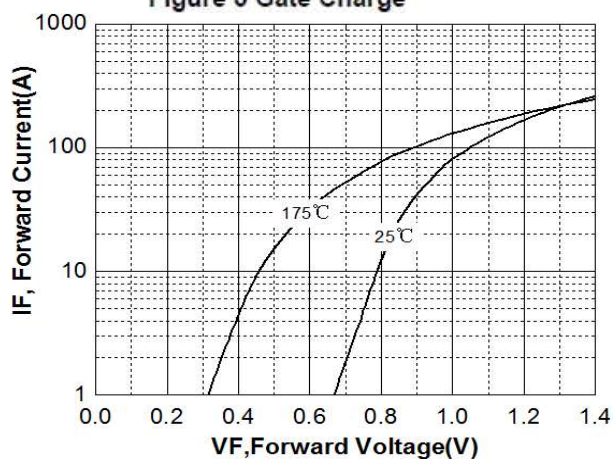


Figure 6 Source- Drain Diode Forward

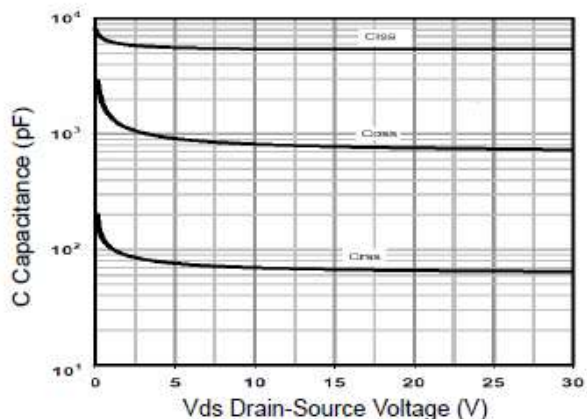


Figure 7 Capacitance vs Vds

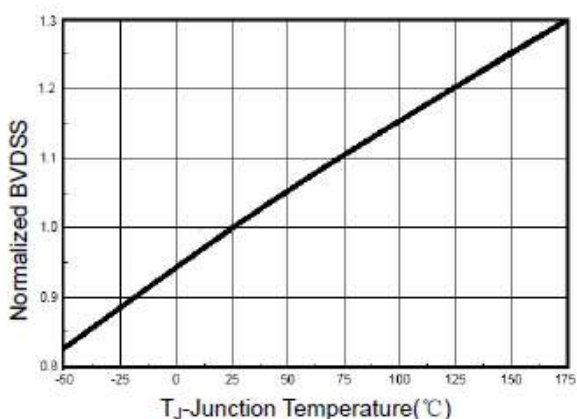


Figure 9 BV_{DSS} vs Junction Temperature

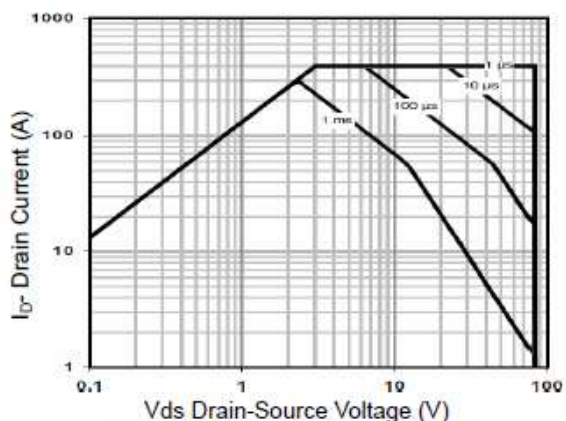


Figure 8 Safe Operation Area

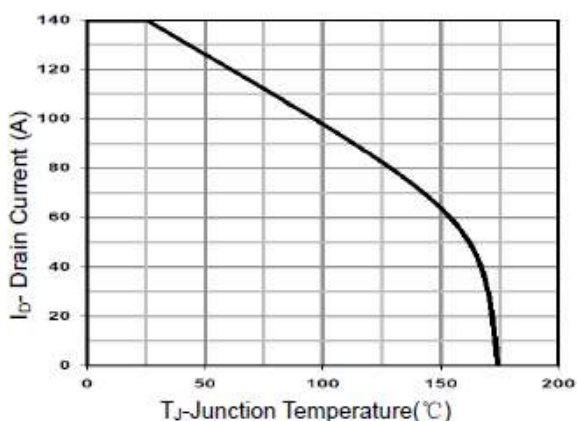


Figure 10 Current De-rating

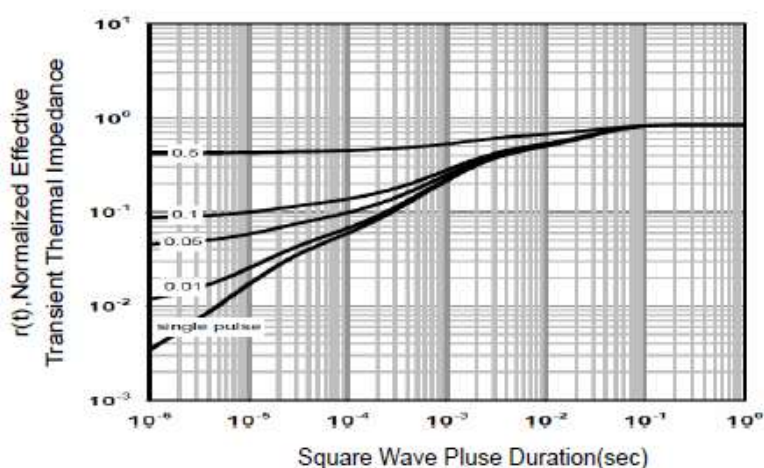
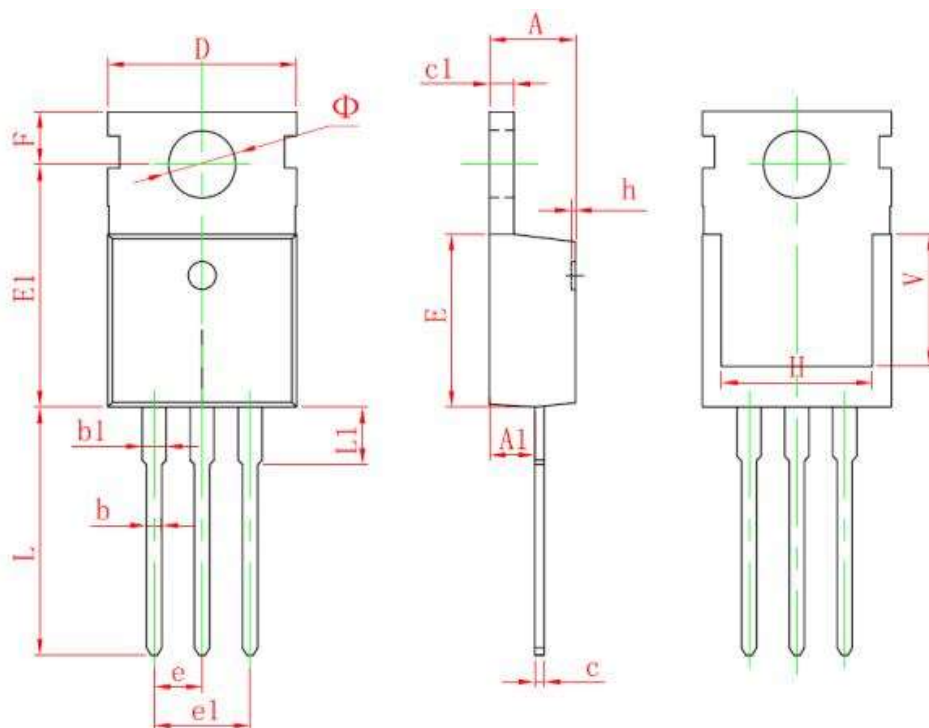


Figure 11 Normalized Maximum Transient Thermal Impedance

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