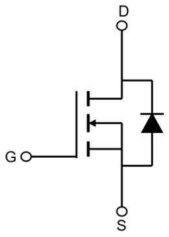
APG020N08D7

N-Channel Enhancement Mosfet

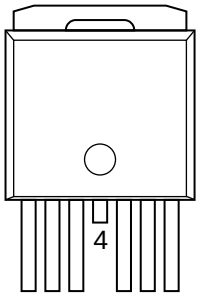
DATA SHEET

Features

- 80V,280A
  $R_{DS(ON)}$ <2.0mΩ@V_{GS}=10V TYP:1.8mΩ
- Surface-mounted package
- Super Trench
- Advanced trench cell design



Schematic Diagram



TO-263-7

Applications

- Power appliances
- BMS appliances
- High power inverter system

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G020N08D7	APG020N08D7	TO-263-7	-	-	800

ABSOLUTE MAXIMUM RATINGS (T_J=25℃ 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_C =25℃) (2,3)	I_D	280	A
Continuous Drain Current (T_C =100℃) (2,3)	I_D	196	A
Pulsed Drain Current (1,2,3)	I_{DM}	1000	A
Single Pulsed Avalanche Energy (V_{DD} =40V,L=0.1mH) (2)	E_{AS}	1605	mJ
Drain Power Dissipation	P_D	158	W
Thermal Resistance from Junction to Case(2)	$R_{\theta JC}$	0.55	℃/W
Thermal Resistance- Junction to Ambient(2)	$R_{\theta JA}$	40	℃/W
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55~ +175	℃

Notes:

1. Pulse width ≤ 300 μs, duty cycle ≤ 2 %
2. Surface Mounted on n 1 in2 pad area, t ≤ 10 sec.
3. Limited by bonding wire

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25℃ 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} =80V, V_{GS} = 0V	-	-	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	2.0	-	4.0	V
Drain-source on-resistance[a]	$R_{DS(on)}$	V_{GS} =10V, I_D =30A	-	1.8	2.0	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =40V, V_{GS} =0V, f =1.0MHz	-	7234	-	pF
Output Capacitance	C_{oss}		-	1280	-	
Reverse Transfer Capacitance	C_{rss}		-	99	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=40V, I_D=30A, R_G=4.5Ω, R_L=1.3Ω,V_G=10V	-	41	-	ns
Turn-on rise time	t_r		-	68	-	
Turn-off delay time	$t_{d(off)}$		-	76	-	
Turn-off fall time	t_f		-	44	-	
Total Gate Charge	Qg	V_{DS}=40V, I_D=30A, V_{GS}=10V	-	124	-	nC
Gate-Source Charge	Qgs		-	31.2	-	
Gate-Drain Charge	Qgd		-	39.2	-	
Source-Drain Diode characteristics						
Diode Forward voltage[a]	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=30A	-	-	1.3	V
Diode Forward current	I_S	T_C=25℃	-	-	280	A
Body Diode Reverse Recovery Time	trr	T_J=25℃， IF=30A,di/dt=100A/us		78		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25℃， IF=30A,di/dt=100A/us		110		uc

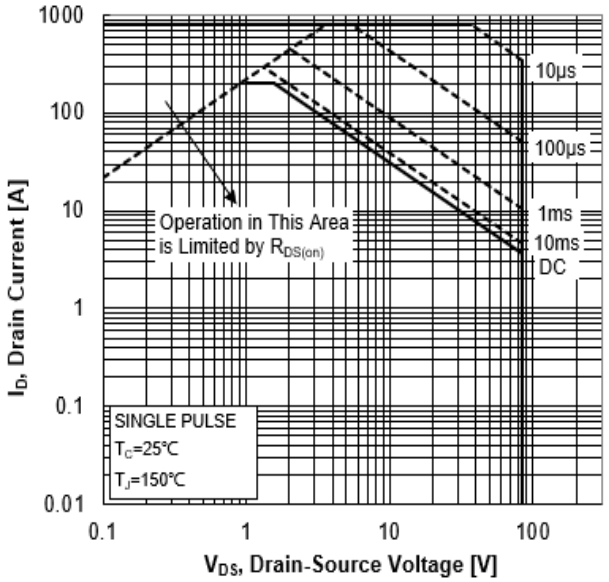
Notes:

a) Pulse width ≤ 300 μs, duty cycle ≤ 2%

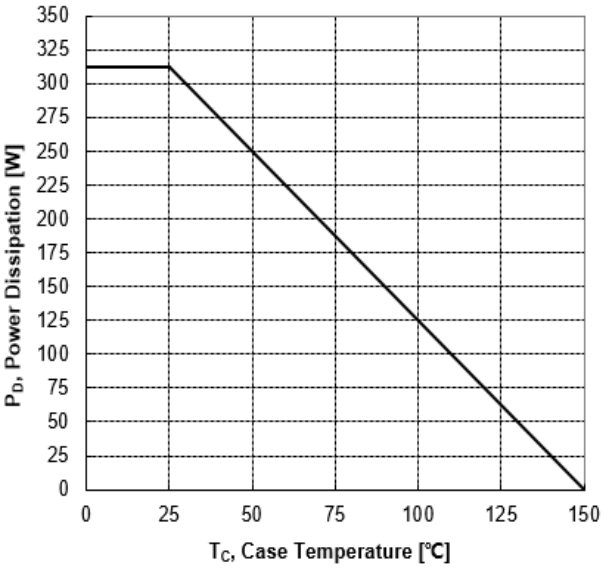
b) Guaranteed by design, not subject to production testing

Typical Characteristics

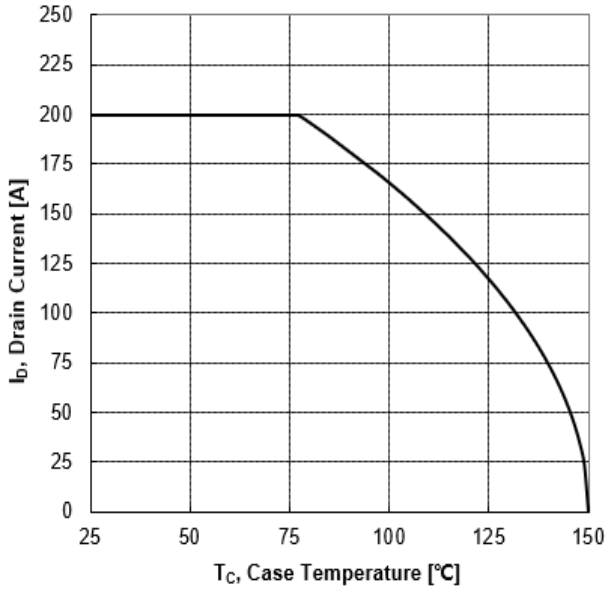
Safe Operating Area



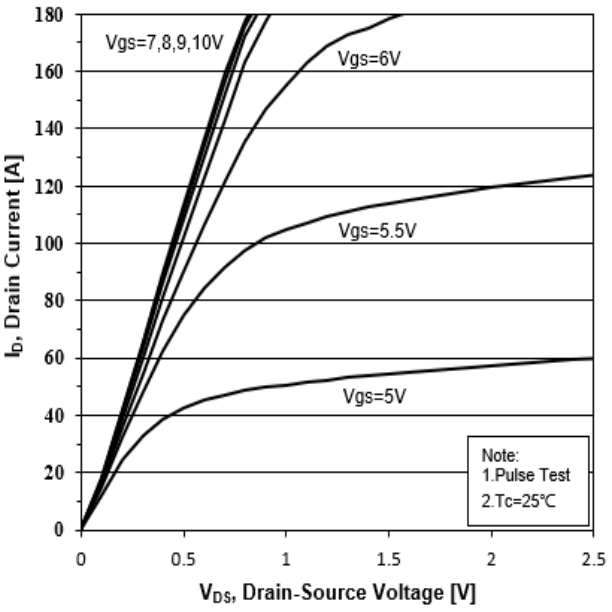
Maximum Power Dissipation vs Case Temperature



Maximum Continuous Drain Current vs Case Temperature

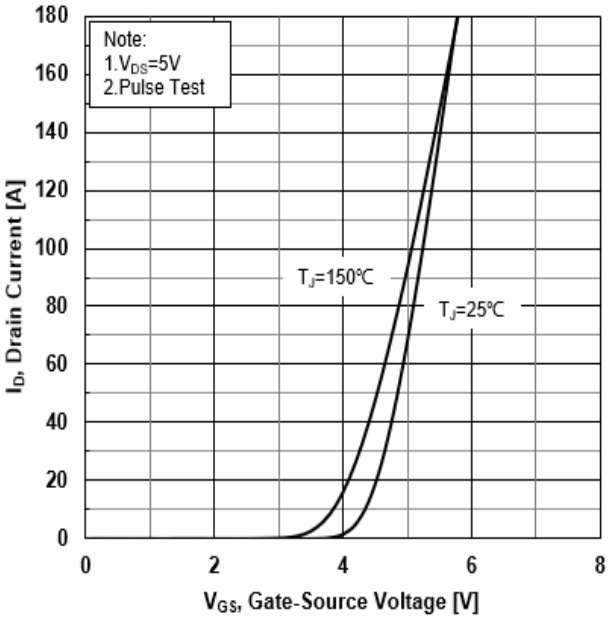


Typical Output Characteristics

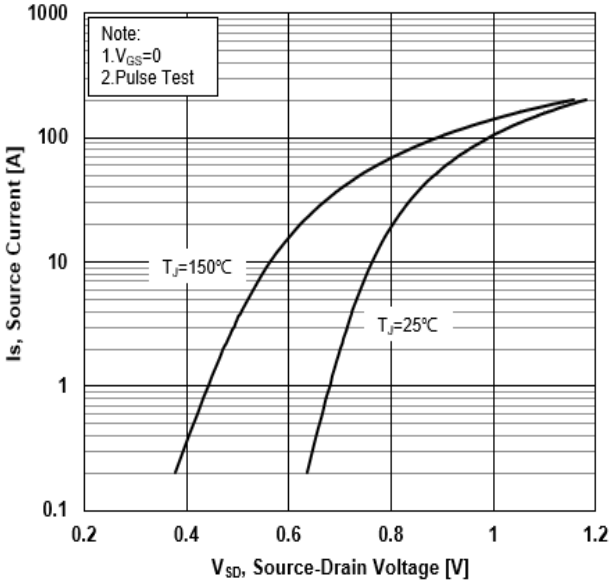


Typical Characteristics

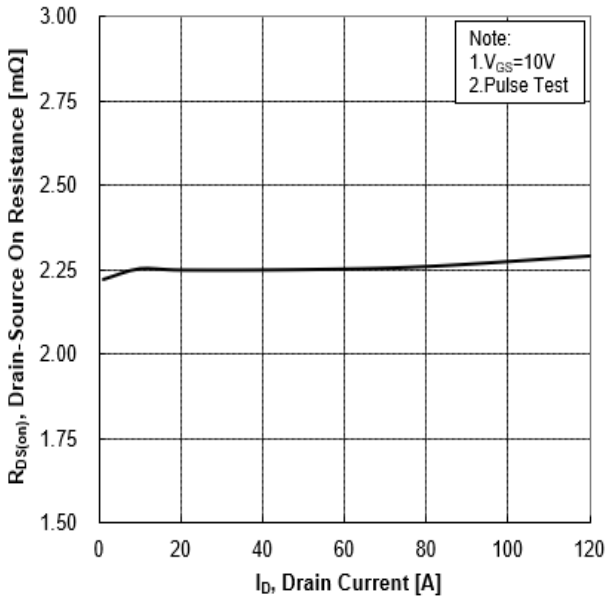
Typical Transfer Characteristics



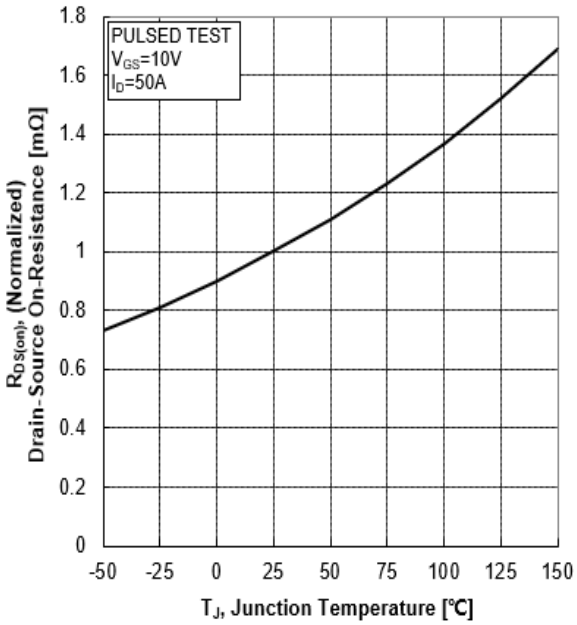
Source-Drain Diode Forward Characteristics



Drain-Source On-Resistance vs Drain Current

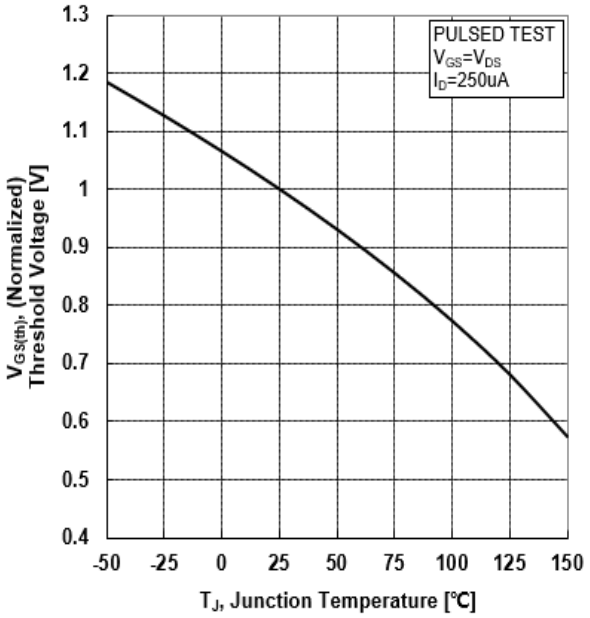


Normalized On-Resistance vs Junction Temperature

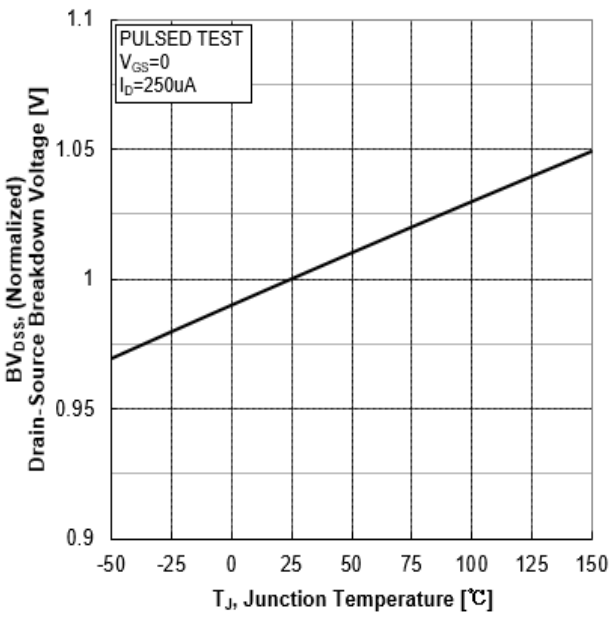


Typical Characteristics

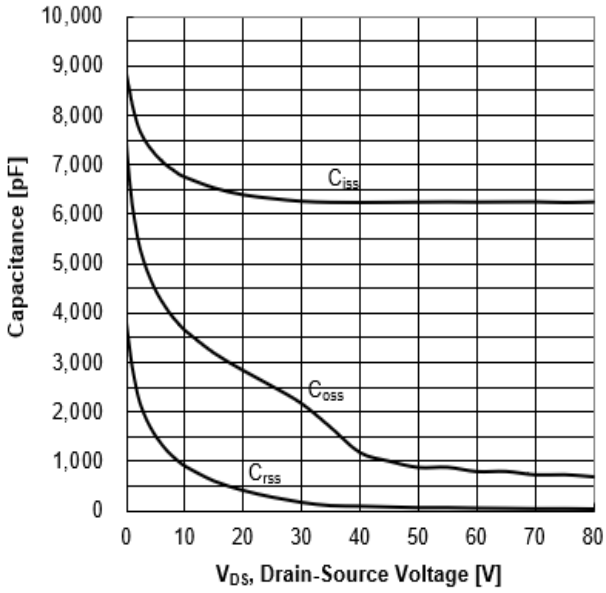
Normalized Threshold Voltage vs Junction Temperature



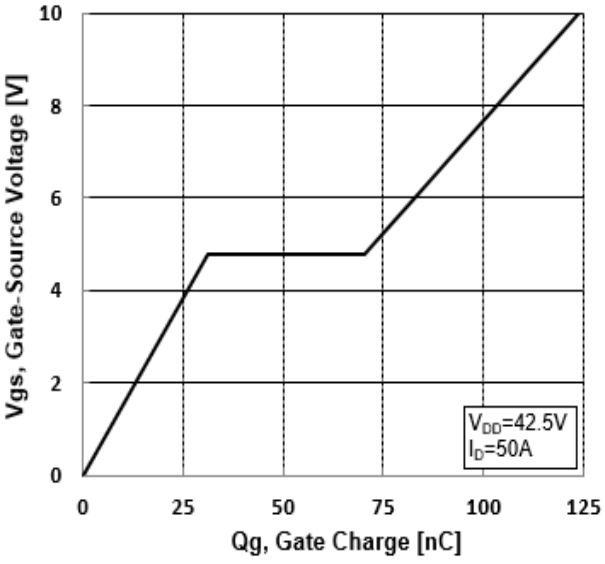
Normalized Breakdown Voltage vs Junction Temperature



Capacitance Characteristics

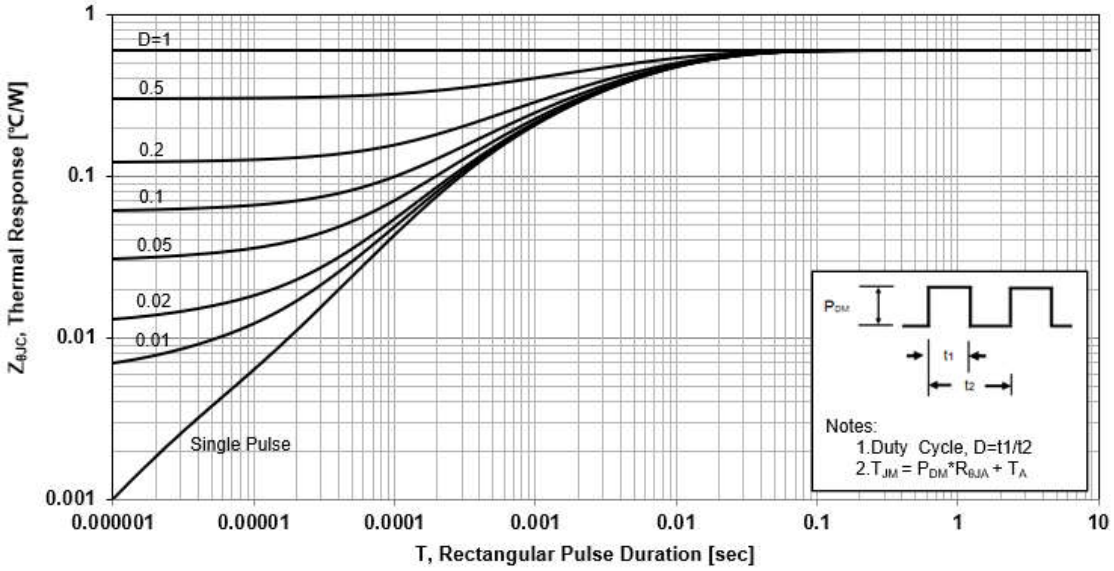


Typical Gate Charge vs Gate-Source Voltage



Typical Characteristics

Transient Thermal Impedance



Package Dimensions

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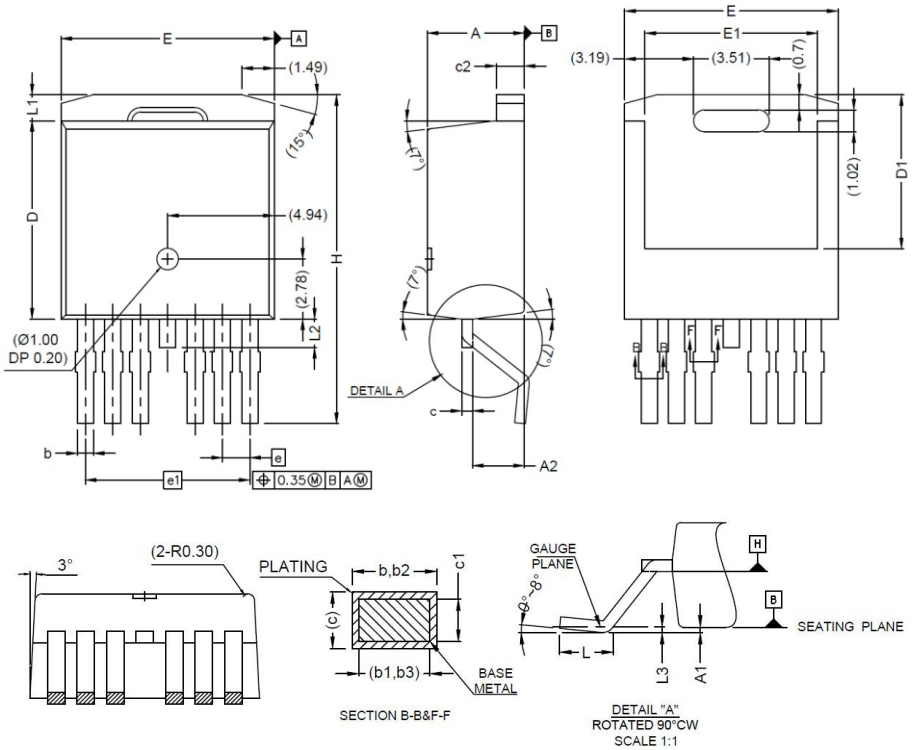

Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	4.30	4.70
A1	-	0.25
A2	2.20	2.60
b	0.65	0.85
b1	0.65	0.80
b2	0.80	1.00
b3	0.80	0.95
c	0.45	0.60
c1	0.45	0.55
c2	1.25	1.40
D	9.00	9.40
D1	6.86	7.42
E	9.68	10.08
E1	7.70	8.30
e	1.27 BSC	
e1	7.62 BSC	
L	1.78	2.79
L1	-	1.60
L2	-	1.78
L3	0.25 BSD	
H	14.61	15.88