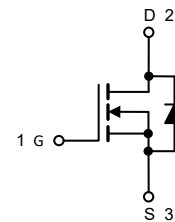
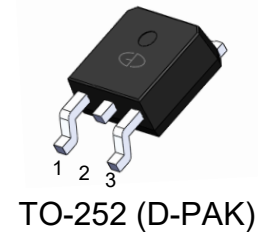


N-Channel 40V (D-S) Power MOSFET

Features

- 100% Avalanche Tested
- Extremely Low Losses with Low FOM $R_{ds(on)} \cdot Q_g$
- RoHS Compliant, Halogen Free, Pb-Free
- AEC-Q101 Qualified
- MSL 1



Applications

- Automotive systems
- Motors, lamps and solenoid control
- Ultra high performance power switching

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$ unless otherwise noted)			
Parameter	Symbol	Value	Unit
Drain Source Voltage	V_{DS}	40	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current, Continuous $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$	250
		$T_C=100^\circ\text{C}$	177
Drain Current, Pulsed (Note 1)	I_{DM}	750	A
Single Avalanche Energy (Note 2)	E_{AS}	552	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	214
		$T_C=100^\circ\text{C}$	107
Operating Junction/ Storage Temperature Range	T_J / T_{STG}	-55 to +175	$^\circ\text{C}$

Note 1: Single Pulse; $t_p \leq 1\mu\text{s}$.

Note 2: $V_{DD} = 20\text{V}$, $V_{GS} = 10\text{V}$, $L = 0.5\text{mH}$, $R_G = 25\Omega$, starting $T_J = 25^\circ\text{C}$.

Thermal Characteristics			
Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to Case	R_{thJC}	0.7	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	R_{thJA}	62.5	$^\circ\text{C/W}$

Note 3: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a 25°C still air environment.

Electrical Characteristics (T_J =25°C unless otherwise noted)

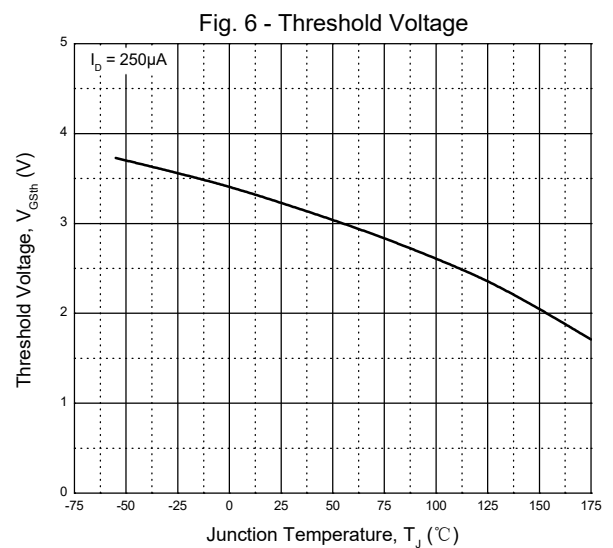
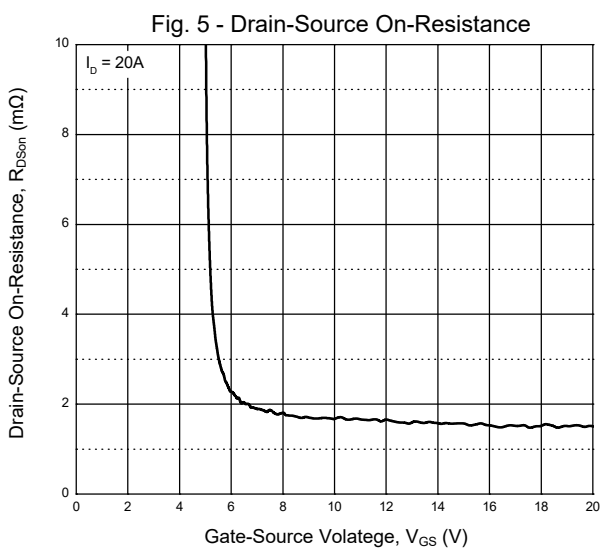
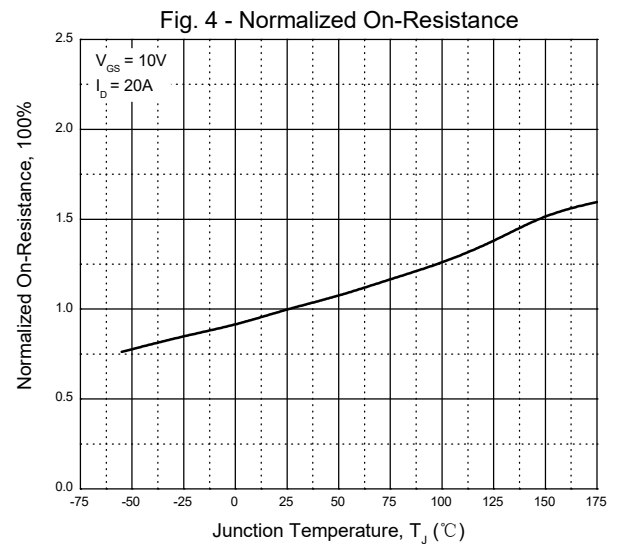
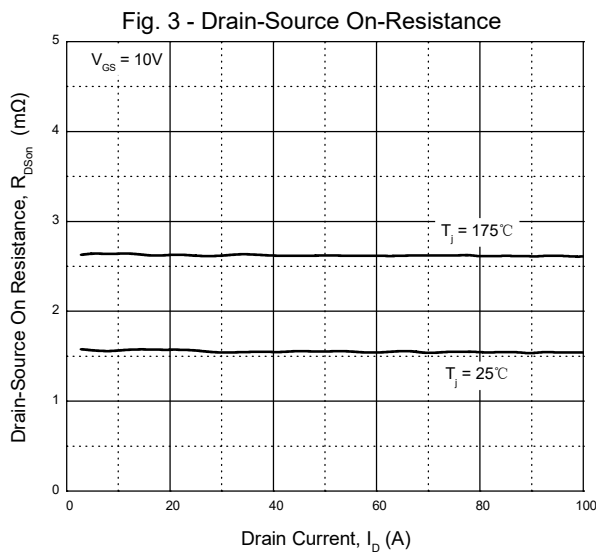
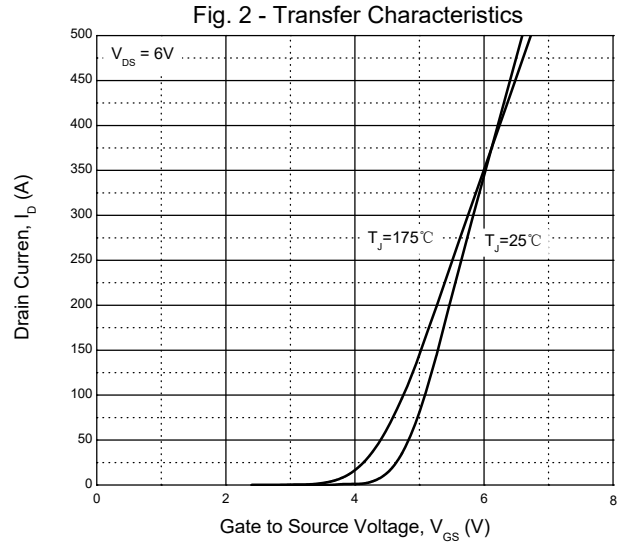
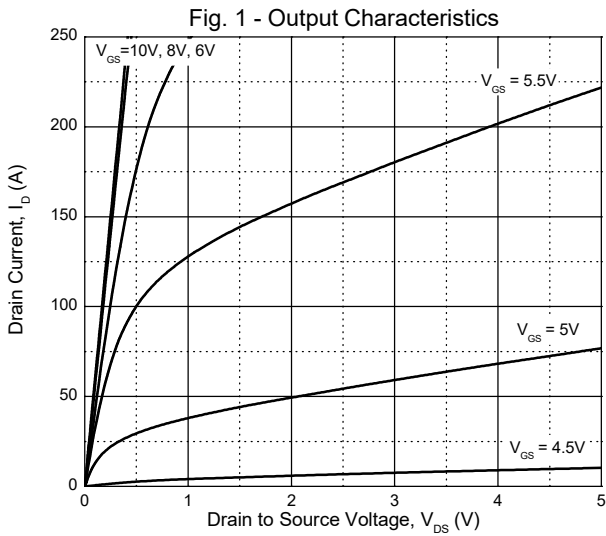
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	--	--	1	uA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	2	3.2	4	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
Drain-Source On-state Resistance (Note 4)	R _{DS(on)}	V _{GS} =10V, I _D =20A	--	1.6	2.0	mΩ
Total Gate Charge	Q _g	V _{GS(off)} =0V, V _{GS(on)} =10V, V _{DD} =32V, I _D =20A	--	80	--	nC
Gate-Source Charge	Q _{gs}		--	24	--	
Gate-Drain Charge	Q _{gd}		--	17	--	
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =15V, R _L =0.75Ω, R _G =3Ω	--	38	--	ns
Turn-on Rise Time	t _r		--	31	--	
Turn-off Delay Time	t _{d(off)}		--	69	--	
Turn-off Fall Time	t _f		--	29	--	
Gate Resistance	R _g	V _{GS} =0V, f=1MHz, open drain	--	2.2	--	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =40V, f=1MHz	--	5754	--	pF
Output Capacitance	C _{oss}		--	1361	--	
Reverse Transfer Capacitance	C _{rss}		--	34	--	

Reverse Diode Characteristics (T_J =25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Forward Current, Continuous	I _{SD}	T _C =25°C	--	--	160	A
Diode Forward Voltage (Note 4)	V _{SD}	I _F =20A, V _{GS} =0V	--	--	1.2	V
Reverse Recovery Time	T _{rr}	V _R =20V, I _F =50A, di/dt=100 A/μs	--	61	--	ns
Reverse Recovery Charge	Q _{rr}		--	69	--	nC

Note 4: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

Typical Characteristics Curves (T_J = 25°C unless otherwise noted)



Typical Characteristics Curves (T_J = 25°C unless otherwise noted)

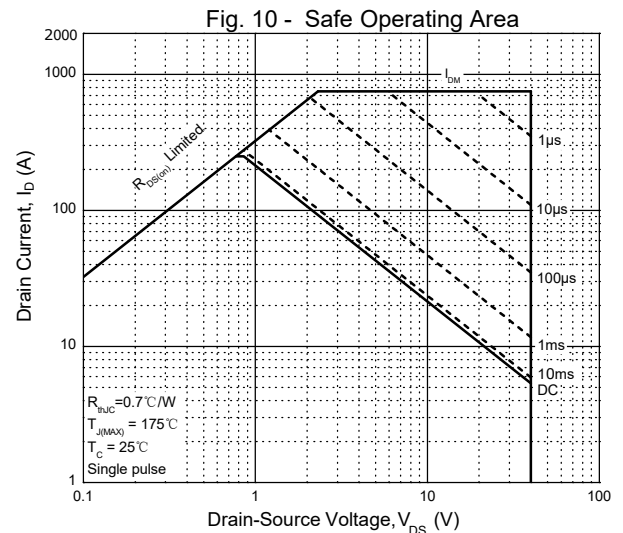
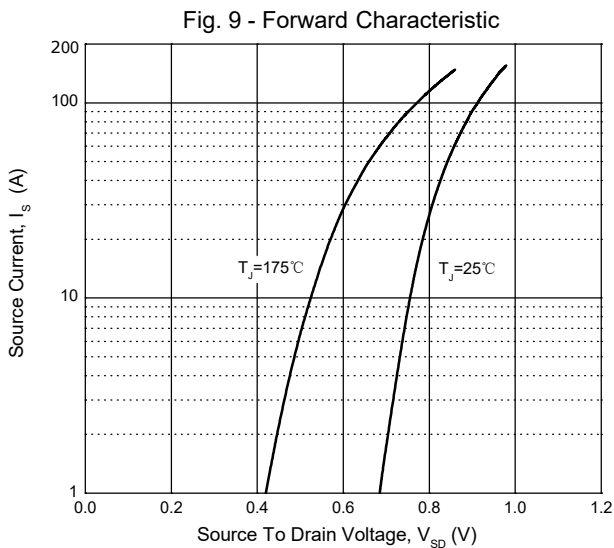
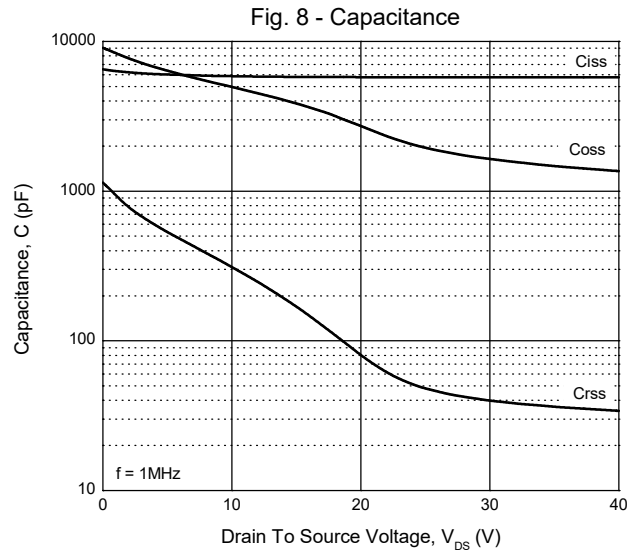
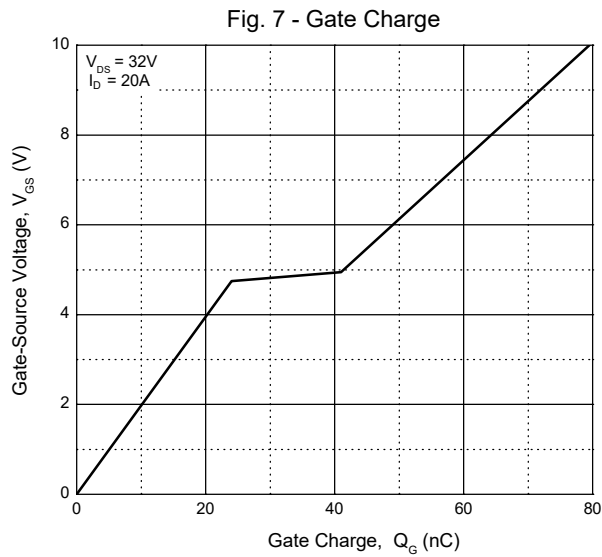
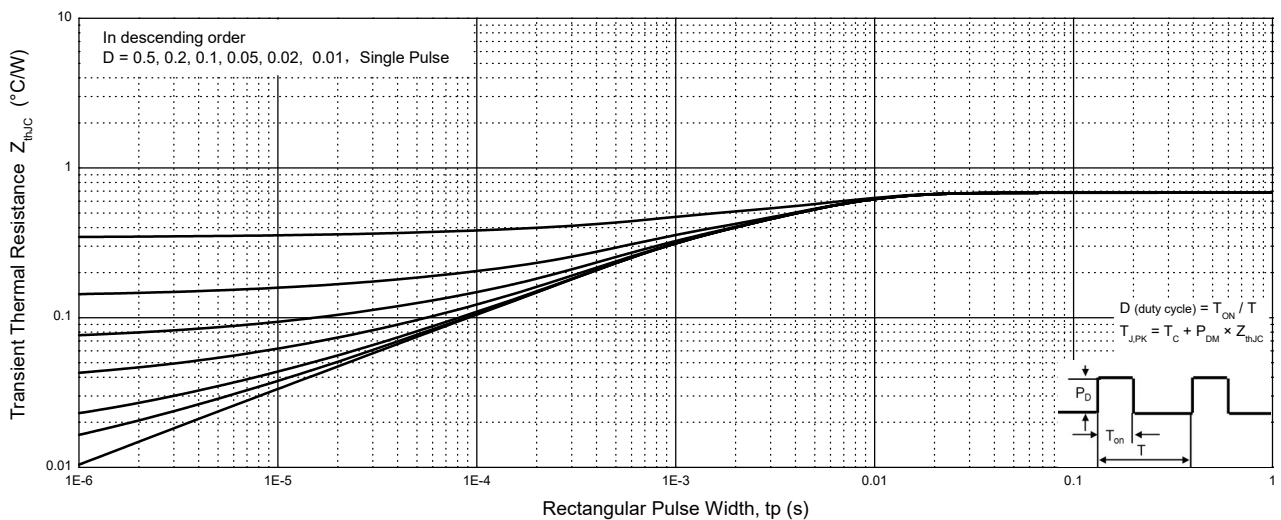


Fig.11 - Maximum Transient Thermal Impedance, Junction-Case



Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Fig. 12 - Power Derating

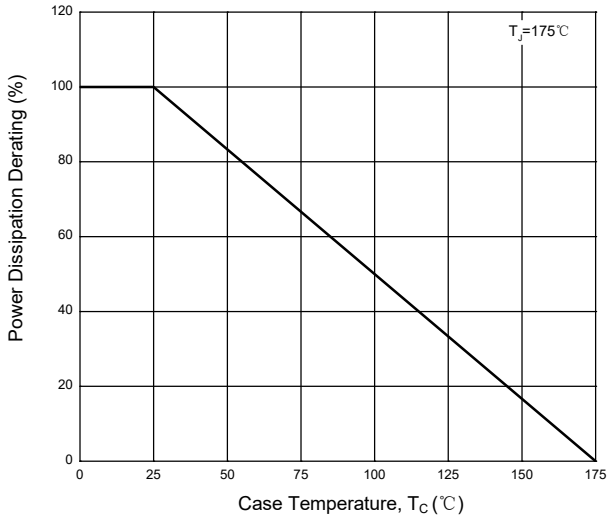
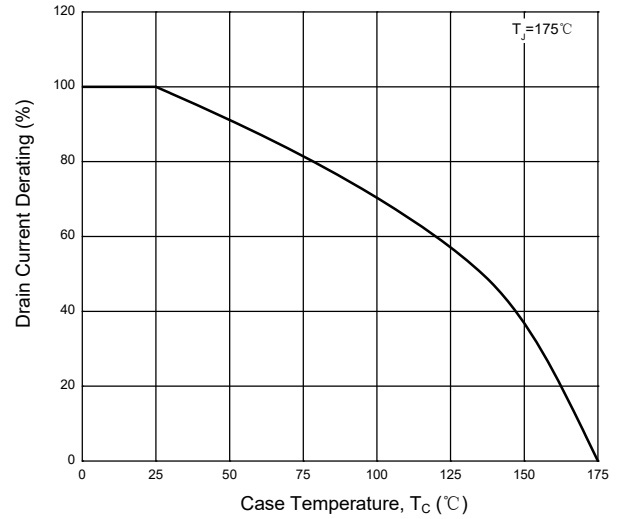
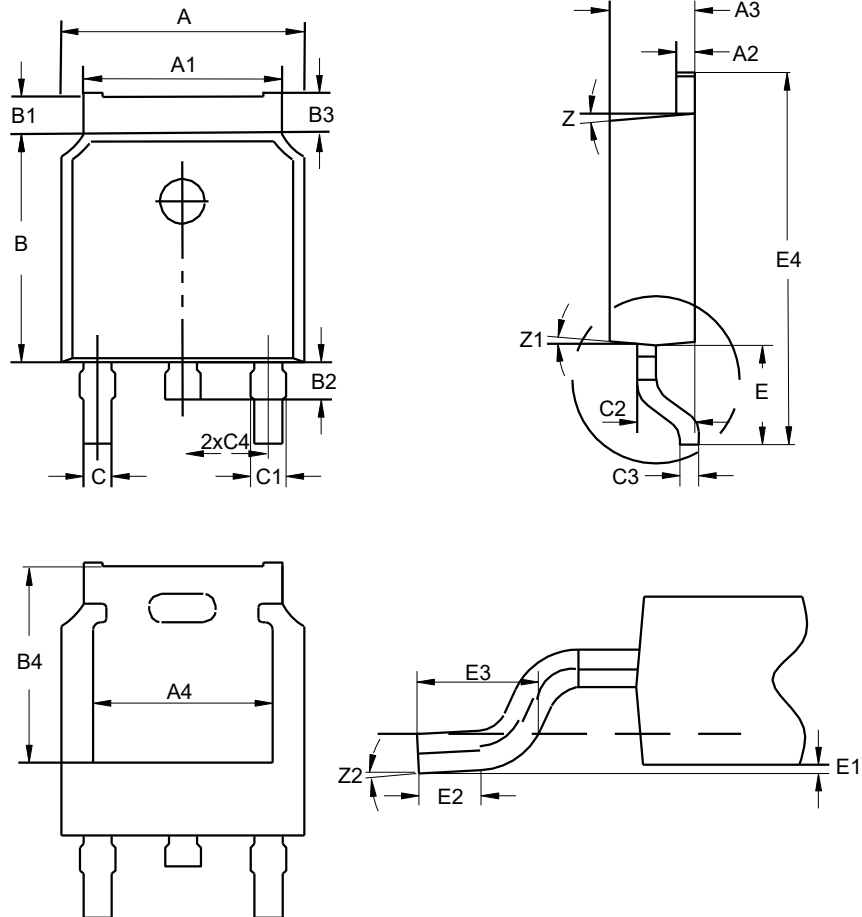


Fig.13 - Drain Current Derating



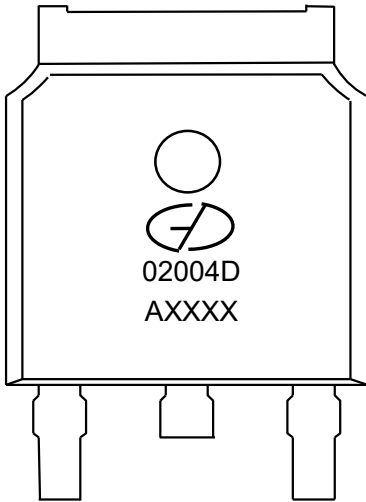
Package Outline Dimensions (Unit: millimeters)

TO-252 (D-PAK)



TO-252							
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	6.34	6.54	6.74	C2	1.34	1.54	1.74
A1	5.2	5.3	5.4	C3	0.4	0.5	0.6
A2	0.4	0.5	0.6	C4	2.09	2.29	2.49
A3	2.08	2.28	2.48	E	2.6	2.9	3.2
A4	4.6	4.8	5.0	E1	0	-	0.15
B	5.8	6.1	6.4	E2	0.7	-	-
B1	0.82	1.02	1.22	E3	1.3	1.6	1.9
B2	0.8	1	1.2	E4	9.8	10.1	10.4
B3	0.9	1.1	1.3	Z	-	7°	-
B4	5.05	5.25	5.45	Z1	-	7°	-
C	0.66	0.76	0.86	Z2	0°	-	10°
C1	0.65	0.85	1.05	-	-	-	-

Marking Outline



Part Name: AGMN02004D

1. Logo Mark: 
2. P/N Mark: 02004D
3. Date Code: AXXXX

Revision History

Version	Date	Major Changes
Rev.A	2024.07.11	Official Release

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