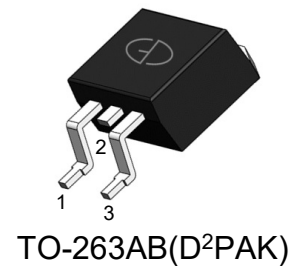


N-Channel 40V (D-S) Power MOSFET

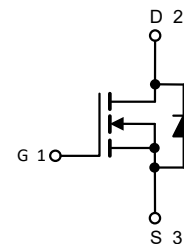
Features

- 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	A
		$T_C=100^\circ\text{C}$ 176	
Drain Current, Pulsed (Note 1)	I_{DM}	750	A
Single Avalanche Energy (Note 2)	E_{AS}	412	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$ 223	W
		$T_C=100^\circ\text{C}$ 111	
Operating Junction and 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}	0.67	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	R_{thJA}	50	$^\circ\text{C/W}$

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	--	4	V
Gate Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	--	--	±100	nA
Drain-Source On-state Resistance (Note 4)	R _{DS(on)}	V _{GS} =10V, I _D =20A	--	1.6	1.8	mΩ
Total Gate Charge	Q _g	V _{GS(off)} =0V, V _{GS(on)} =10V, V _{DD} =32V, I _D =20A	--	76	--	nC
Gate-Source Charge	Q _{gs}		--	23	--	
Gate-Drain Charge	Q _{gd}		--	29	--	
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =15V, R _L =0.75Ω, R _G =3Ω	--	17	--	ns
Turn-on Rise Time	t _r		--	52	--	
Turn-off Delay Time	t _{d(off)}		--	52	--	
Turn-off Fall Time	t _f		--	40	--	
Gate Resistance	R _g	V _{GS} =0V, f=1MHz, open drain	--	2.0	--	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =40V, f=1MHz	--	4510	--	pF
Output Capacitance	C _{oss}		--	1140	--	
Reverse Transfer Capacitance	C _{rss}		--	76	--	

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	--	--	167	A
Diode Forward Voltage (Note 4)	V _{SD}	I _F =100A, V _{GS} =0V	--	--	1.2	V
Reverse Recovery Time	T _{rr}	V _R =20V, I _F =50A di/dt=100A/μs	--	82	--	ns
Reverse Recovery Charge	Q _{rr}		--	100	--	nC

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

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

Fig. 1 - Output Characteristics

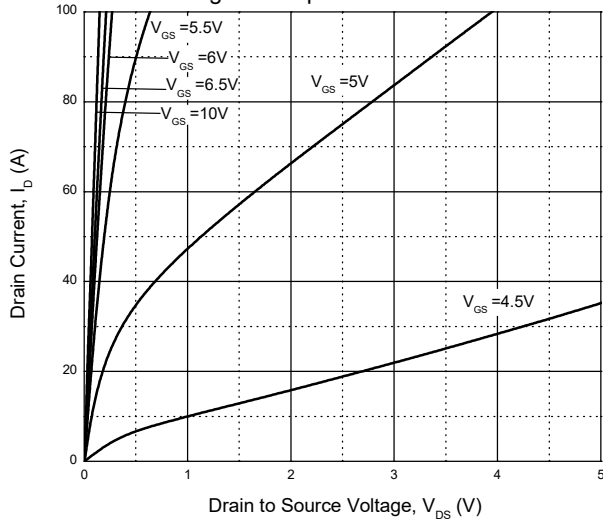


Fig. 2 - Transfer Characteristics

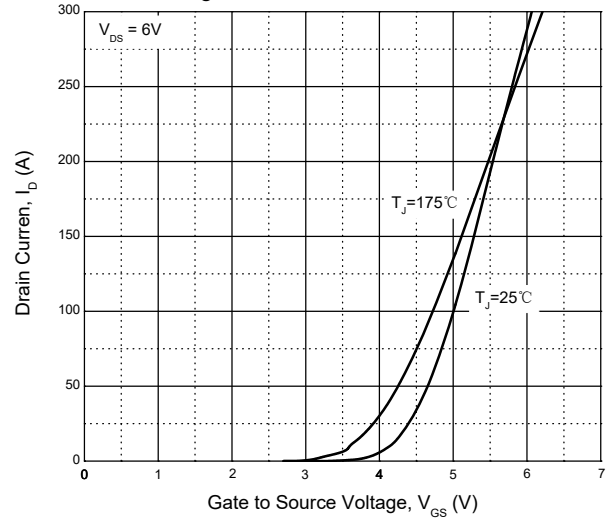


Fig. 3 - Drain-Source On-Resistance

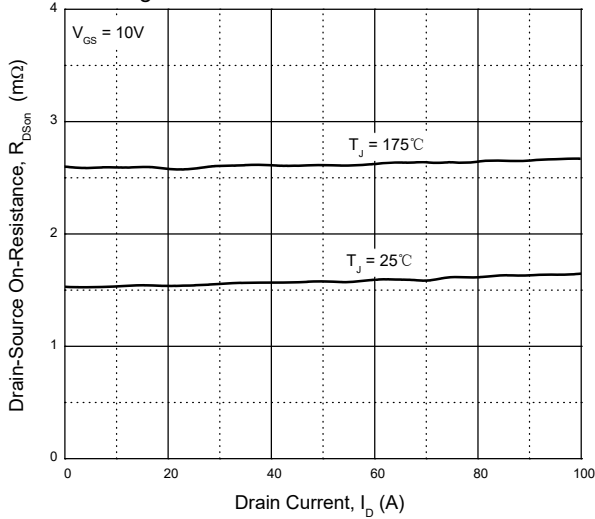


Fig. 4 - Normalized On-Resistance

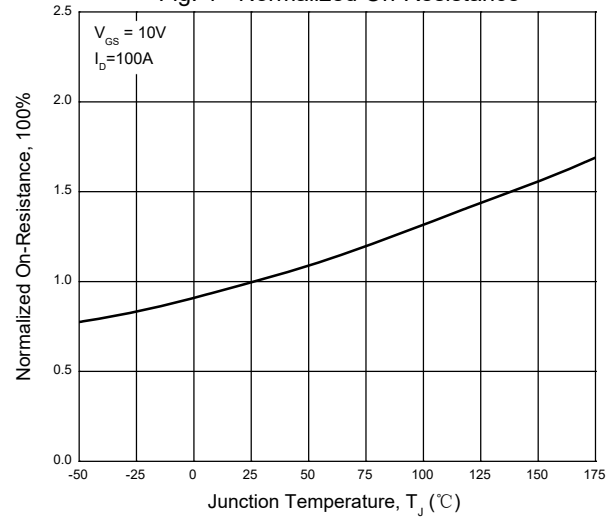


Fig. 5 - Drain-Source On-Resistance

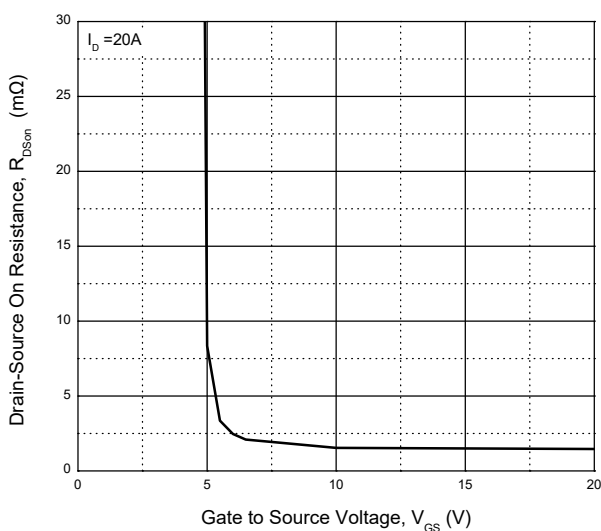
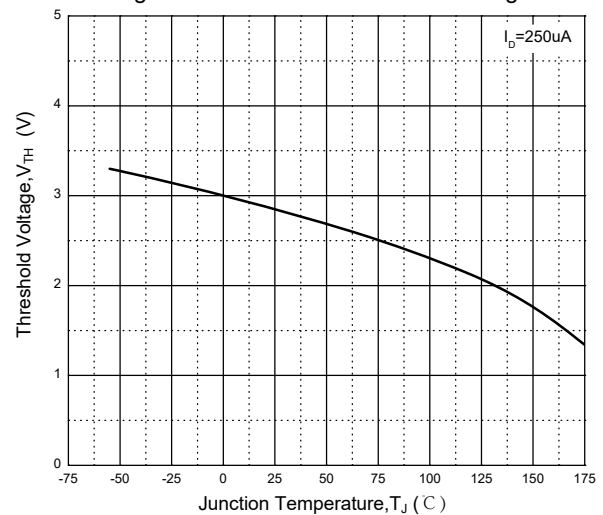


Fig. 6 - Gate-Source Threshold Voltage



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

Fig. 7 - Capacitance

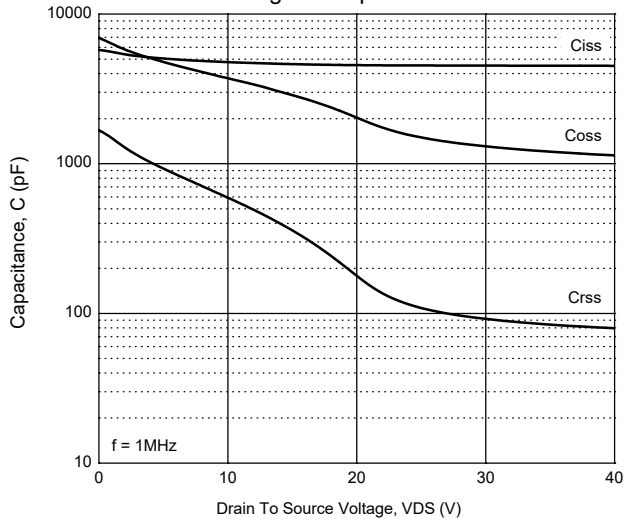


Fig. 8 - Gate Charge

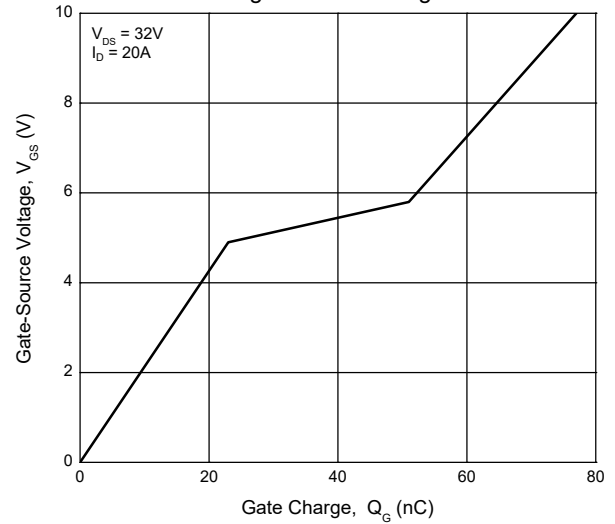


Fig.9 - Forward Characteristic

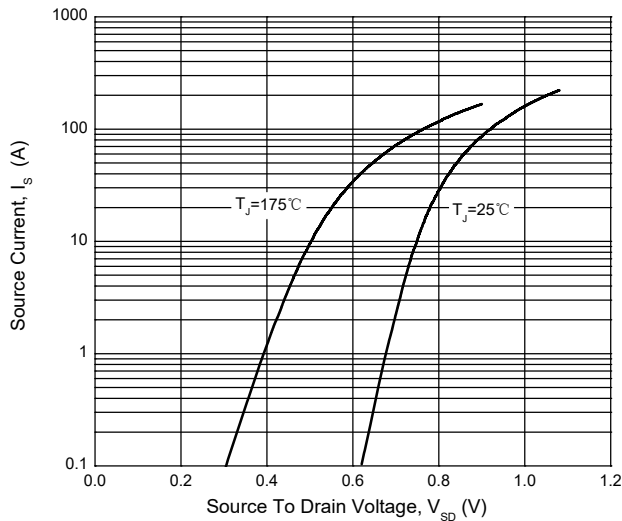


Fig. 10 - Safe Operating Area

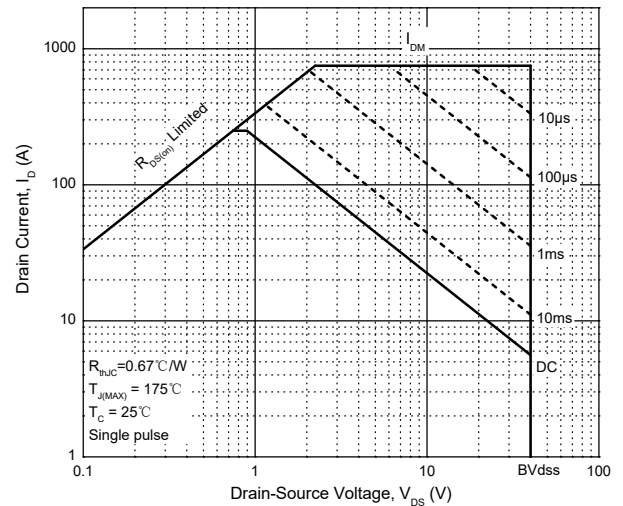
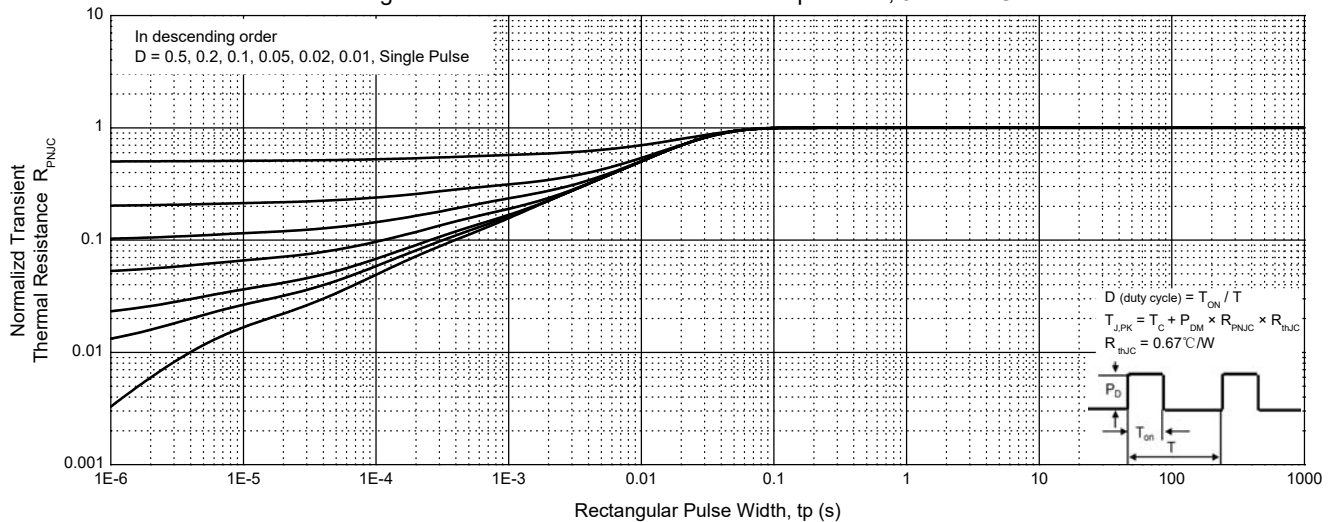


Fig.11 - Normalized Transient Thermal Impedance, Junction-Case



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

Fig. 12 - Power Derating

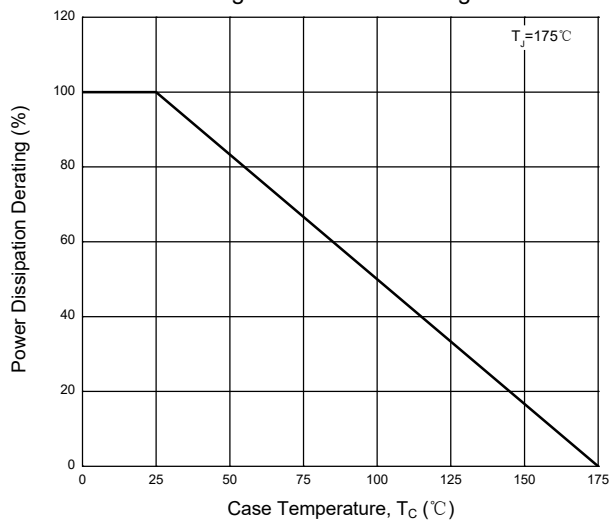
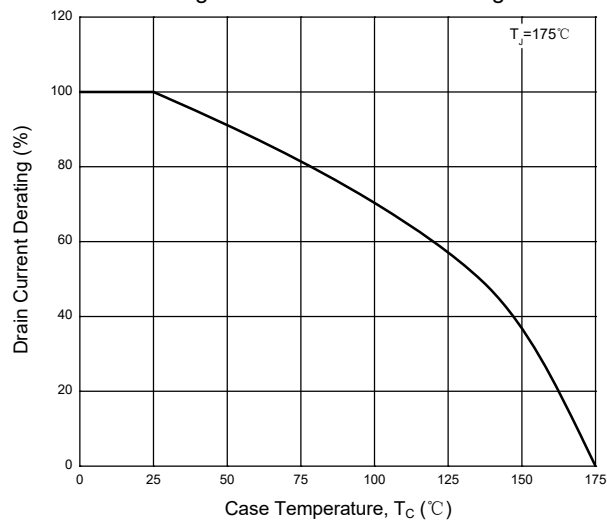
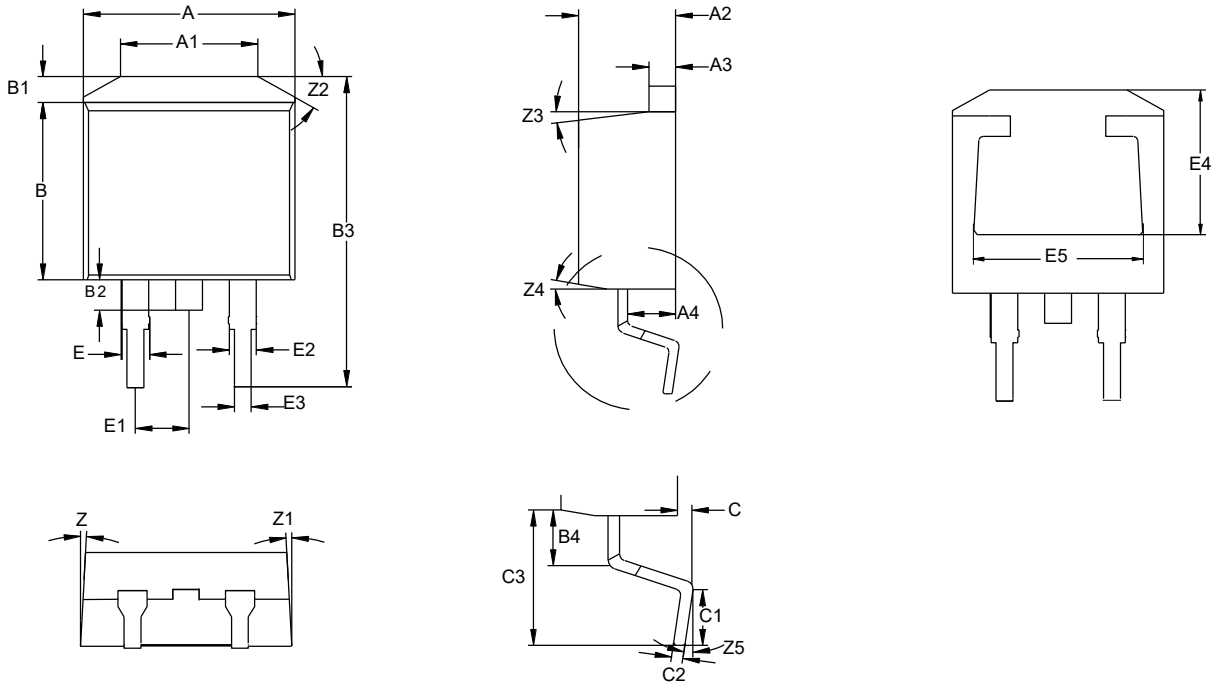


Fig. 13 - Drain Current Derating



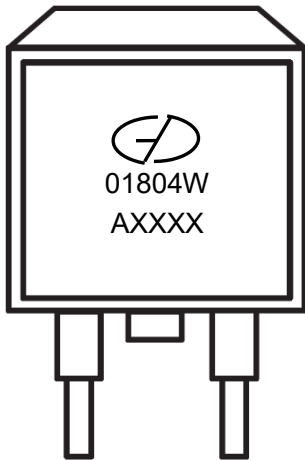
Package Outline Dimensions (Unit: millimeters)

TO-263AB



TO-263AB							
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	9.8	10	10.2	C3	5	5.3	5.6
A1	6.5	-	-	E	1.17	1.37	1.57
A2	4.4	4.6	4.8	E1	2.44	2.54	2.64
A3	1.17	1.27	1.37	E2	1.17	1.27	1.37
A4	2.37	2.67	2.97	E3	0.7	0.8	0.9
B	8.5	8.7	8.9	E4	-	7.1	-
B1	1.07	1.27	1.47	E5	-	8.7	-
B2	1.2	1.5	1.8	Z	-	3°	-
B3	15	15.3	15.6	Z1	-	3°	-
B4	1.8	2	2.2	Z2	-	30°	-
C	0	-	0.25	Z3	-	7°	-
C1	2.34	2.54	2.74	Z4	-	7°	-
C2	0.3	0.45	0.6	Z5	0°	-	8°

Marking Outline



Part Name: AGMN01804W

1. Logo Mark: 
2. P/N Mark: 01804W
3. Date Code: AXXXX

Revision History

Version	Date	Major Changes
Rev.A	2024.03.26	Official Release

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