

### • General Description

The AGM304AP combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

This device is ideal for load switch and battery protection applications.

### • Features

- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance
- 100% Avalanche tested
- 100% DVDS tested

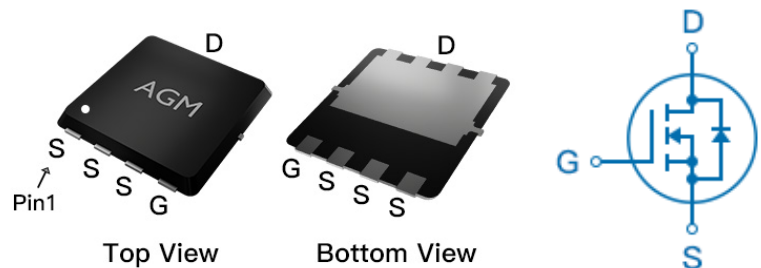
### • Application

- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

### Product Summary

BVDSS	RDSON	ID
30V	3.8mΩ	40A

### PDFN3.3\*3.3 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM304AP	AGM304AP	PDFN3.3*3.3	330mm	12mm	5000

Table 1. Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage ( $V_{GS}=0V$ )	30	V
VGS	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
ID	Drain Current-Continuous( $T_c=25^{\circ}\text{C}$ ) (Note 1)	40	A
	Drain Current-Continuous( $T_c=100^{\circ}\text{C}$ )	28	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	160	A
PD	Maximum Power Dissipation( $T_c=25^{\circ}\text{C}$ )	20	w
	Maximum Power Dissipation( $T_c=100^{\circ}\text{C}$ )	8.0	w
EAS	Avalanche energy (Note 3)	81	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	$^{\circ}\text{C}$

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	50	$^{\circ}\text{C}/\text{W}$
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	6.5	$^{\circ}\text{C}/\text{W}$

**Table 3. Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=30V, VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V, VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	1.2	--	2.2	V
gFS	Forward Transconductance	VDS=5V, ID=10A	--	12	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	3.8	4.5	mΩ
		VGS=4.5V, ID=15A	--	5.1	6.5	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=15V, VGS=0V, F=1MHZ	--	814	--	pF
Coss	Output Capacitance		--	398	--	pF
Crss	Reverse Transfer Capacitance		--	28	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V, f=1.0MHz	--	1.7	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V, VDS=15V, RL=0.75Ω, RGEN=3.3Ω	--	7.1	--	nS
tr	Turn-on Rise Time		--	40	--	nS
td(off)	Turn-Off Delay Time		--	15	--	nS
tf	Turn-Off Fall Time		--	6	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=15V, ID=10A	--	8.0	--	nC
Qgs	Gate-Source Charge		--	2.4	--	nC
Qgd	Gate-Drain Charge		--	3.2	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)	VG=VD=0V , Force Current	--	--	40	A
VSD	Forward on Voltage	VGS=0V, IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , TJ=25°C	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25°C, Vgs=10V, Vdd=20V, ID=18A, L=0.5mH, Rg=25ohm

### Typical Characteristics

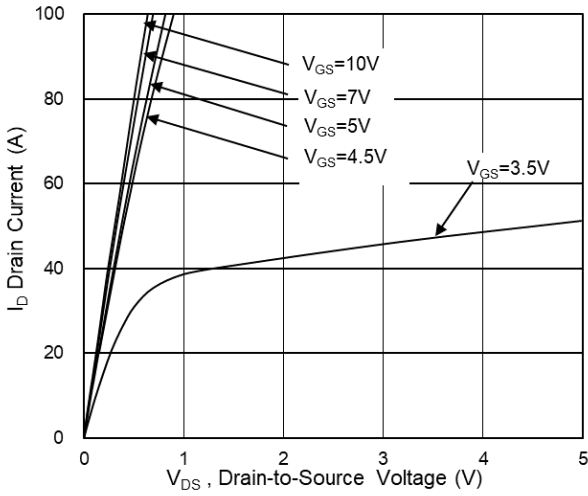


Fig.1 Typical Output Characteristics

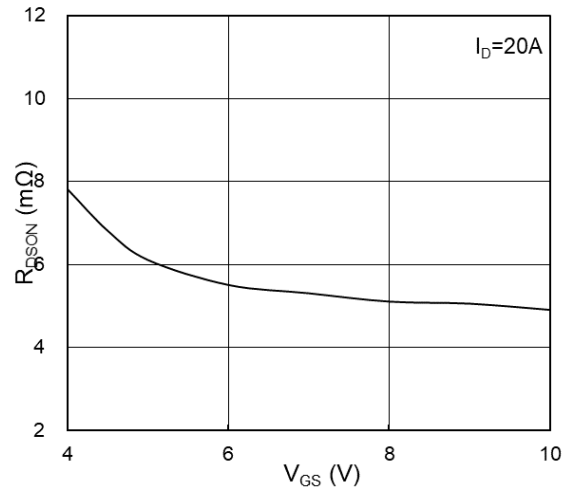


Fig.2 On-Resistance vs G-S Voltage

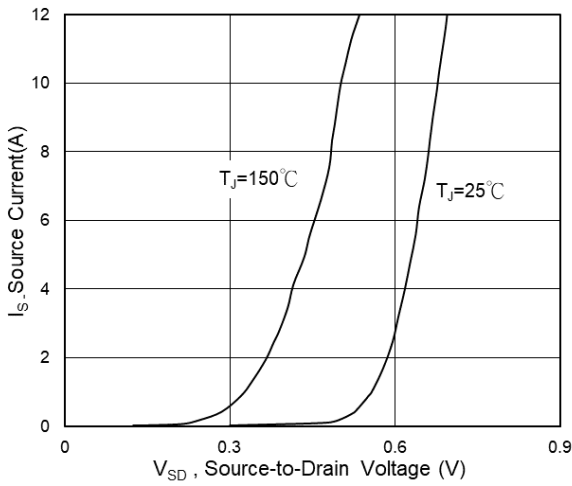


Fig.3 Source Drain Forward Characteristics

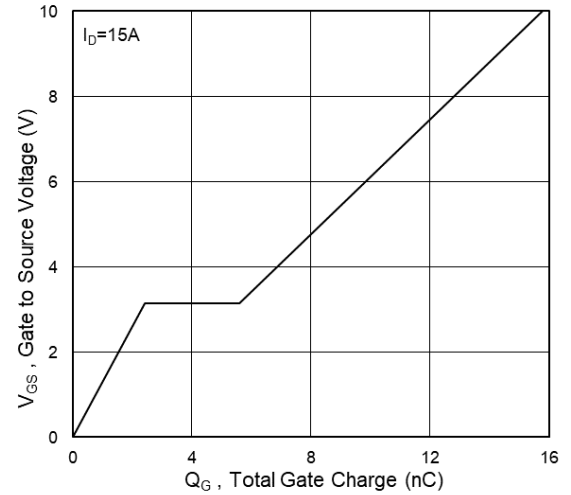


Fig.4 Gate-Charge Characteristics

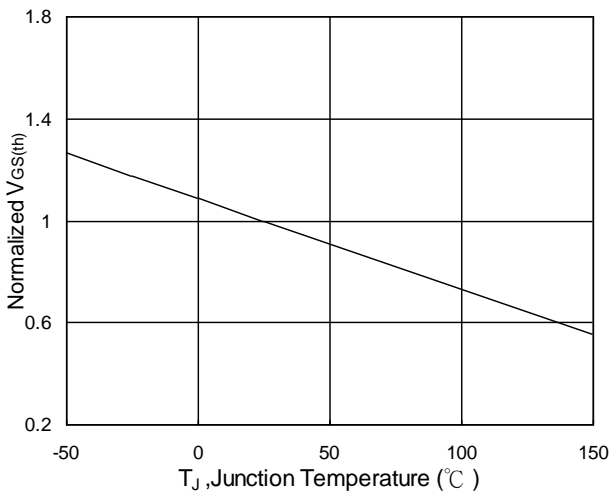


Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$

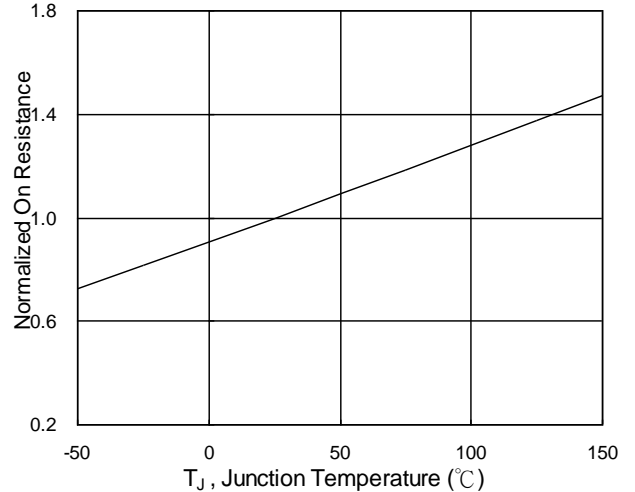


Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$

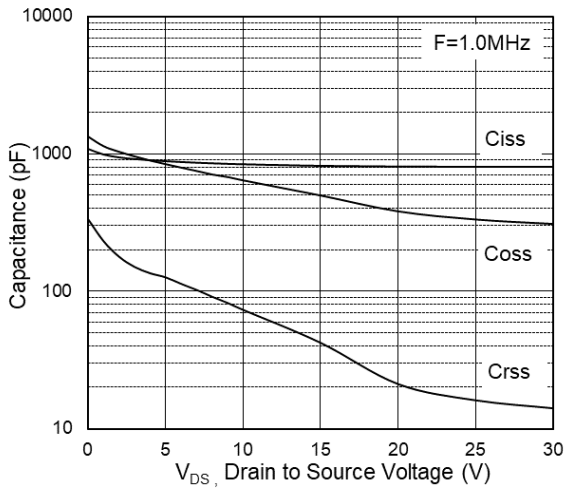


Fig.7 Capacitance

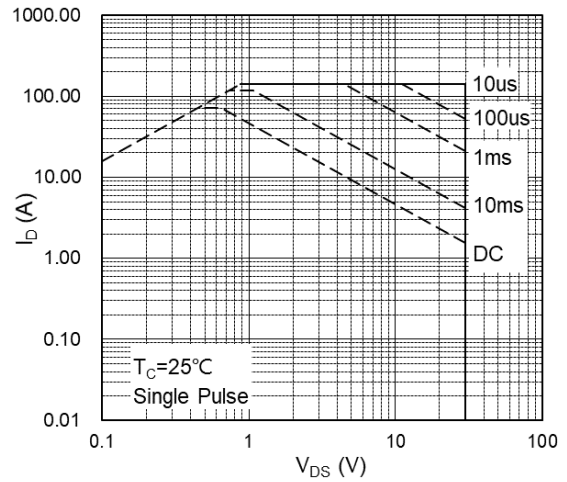


Fig.8 Safe Operating Area

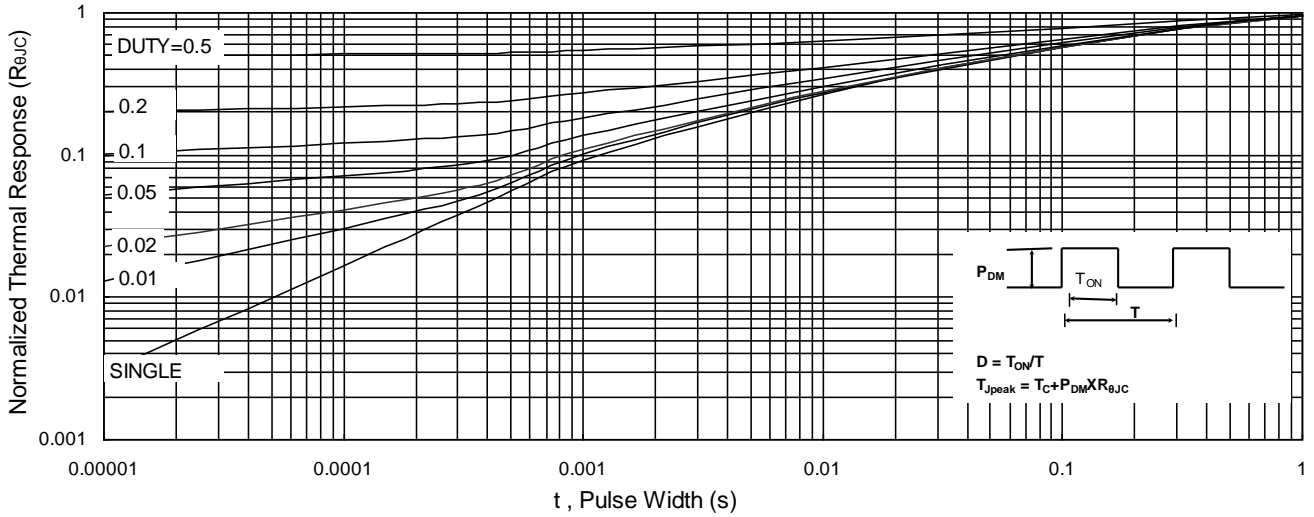


Fig.9 Normalized Maximum Transient Thermal Impedance

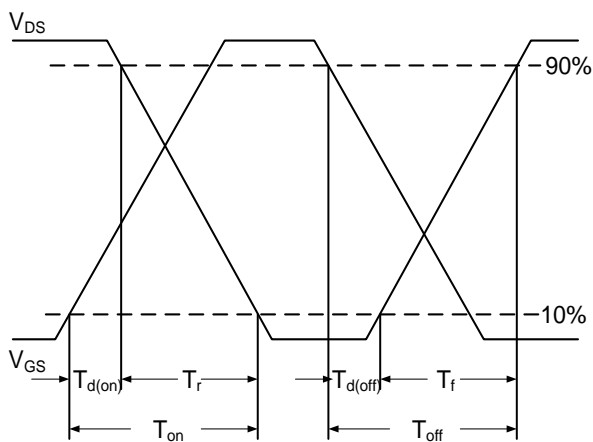


Fig.10 Switching Time Waveform

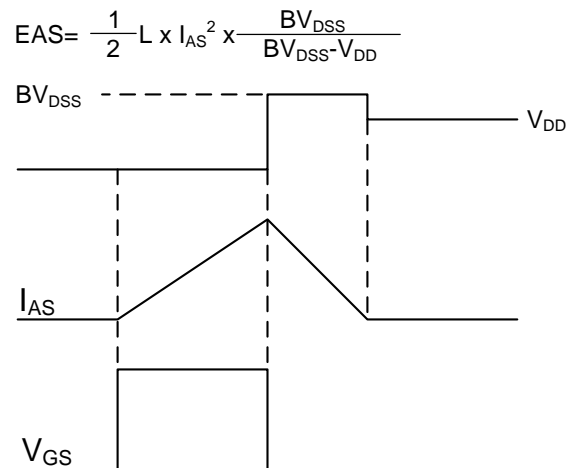
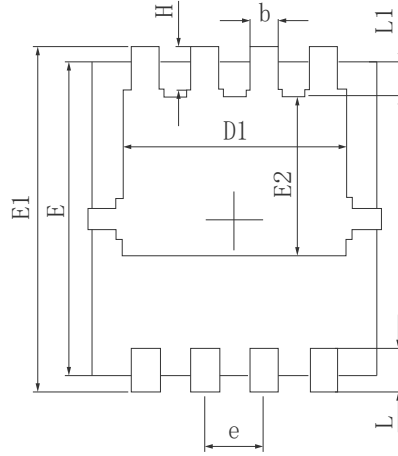
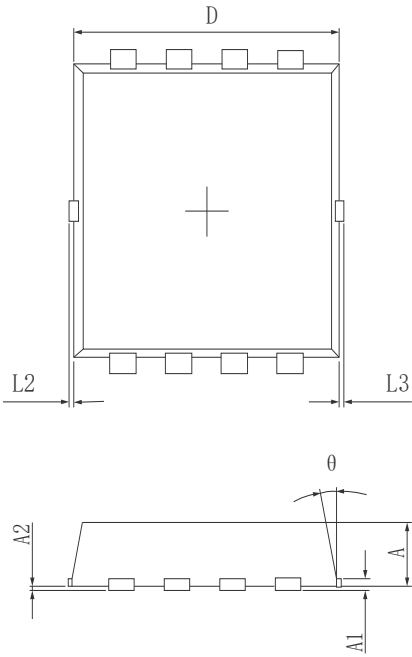
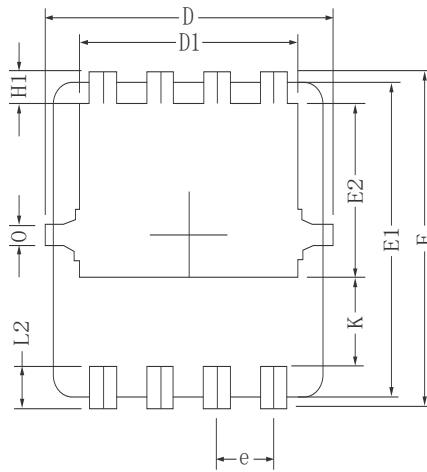
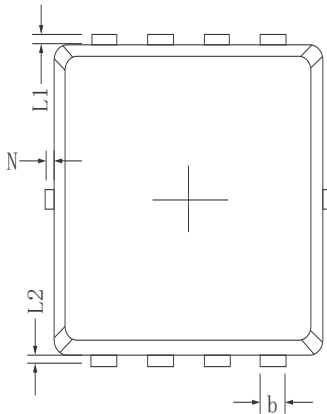


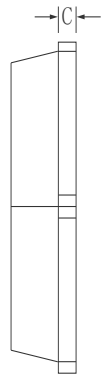
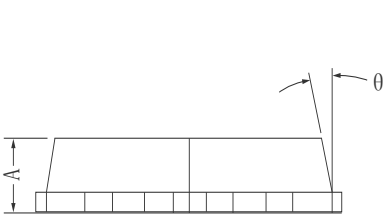
Fig.11 Unclamped Inductive Switching Waveform

**●Dimensions (PDFN3.3\*3.3)**


SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.700	0.800	0.900
A1	0.152REF.		
A2	0~0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.320	1.520	1.720
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0~0.100		
L3	0~0.100		
H	0.315	0.415	0.515
θ	8°	10°	12°

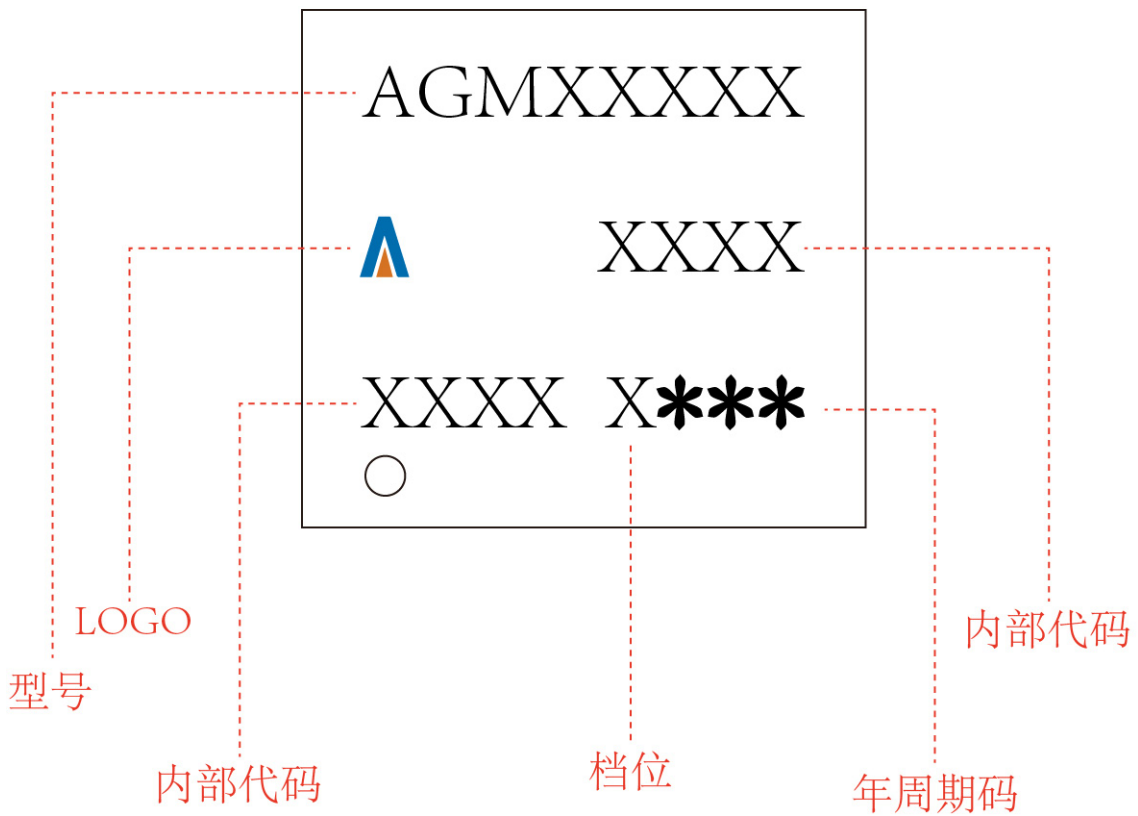


Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.60	1.70	1.80
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.78	0.88	0.98
L1/L2	0.10 REF.		
θ	11°	12°	13°
N	0	-	0.15
0	0.2 REF.		



PDFN3.3\*3.3

Marking Instructions:




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