

General Description

The AGM304MBQ 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

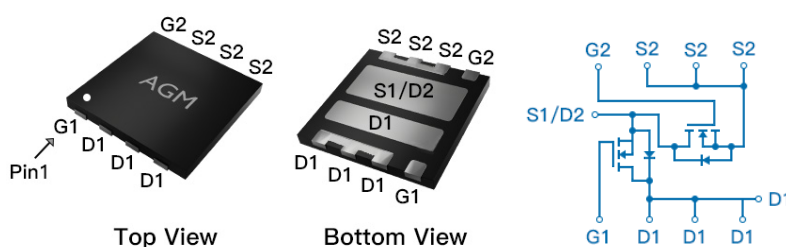
Application

- Electronic Ballast
- Electronic Transformer
- Switch Mode Power Supply

Product Summary

BVDSS	RDSON	ID
30V	4.2mΩ	45A

WQFN3*3 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM304MBQ	AGM304MBQ	WQFN3*3	330mm	12mm	5000

Table 1. Absolute Maximum Ratings (TA=25°C)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	45	A
	Drain Current-Continuous(Tc=100°C)	30	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	180	A
PD	Maximum Power Dissipation(Tc=25°C)	23	w
	Maximum Power Dissipation(Tc=100°C)	9.3	w
EAS	Avalanche energy (Note 3)	81	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) ¹	63	75	°C/W
RθJC	Thermal Resistance Junction-Case ¹	4.6	5.4	°C/W

Table 3. Electrical Characteristics (TJ=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
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	1.5	2.2	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	17	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=15A	--	4.2	5.5	mΩ
		VGS=4.5V, ID=10A	--	6.0	7.0	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V, F=1MHZ	--	869	--	pF
Coss	Output Capacitance		--	435	--	pF
Crss	Reverse Transfer Capacitance		--	54.5	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	0.7	1.61	2.3	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V, VDS=15V, RL=0.75 , RGEN=3	--	8.9	--	nS
tr	Turn-on Rise Time		--	73.9	--	nS
td(off)	Turn-Off Delay Time		--	17.7	--	nS
tf	Turn-Off Fall Time		--	81	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=15V, ID=20A	--	17	--	nC
Qgs	Gate-Source Charge		--	3.8	--	nC
Qgd	Gate-Drain Charge		--	3.2	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	45	A
VSD	Forward on Voltage	VGS=0V,ISD=15A	--	--	1.2	V
trr	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , TJ=25℃	--	14	--	ns
Qrr	Reverse Recovery Charge		--	3	--	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 ,VDD=20V,Vgs=10V,ID=18A, L=0.5mH,RG=25ohm

TYPICAL ELECTRICAL AND THERMAL CHARACTERIS

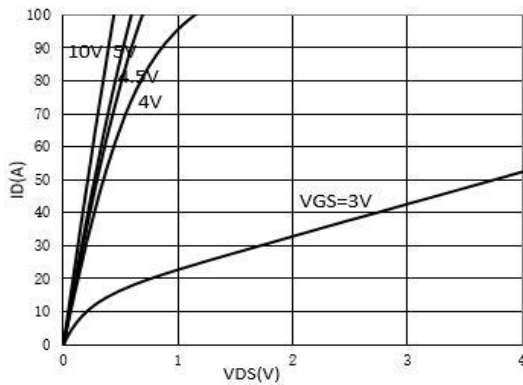


Figure 1: On-Region Characteristics (Note E)

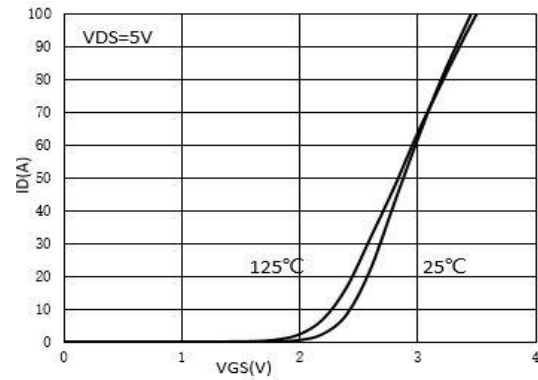


Figure 2: Transfer Characteristics (Note E)

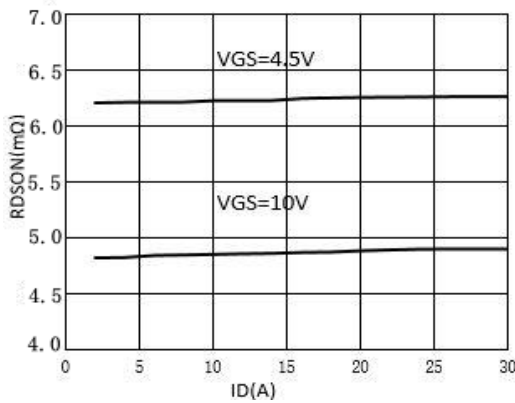


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

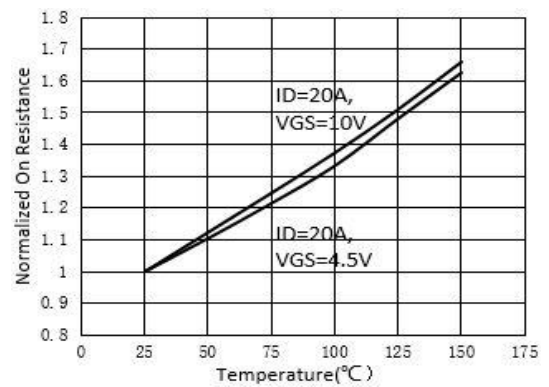


Figure 4: On-Resistance vs. Junction Temperature (Note E)

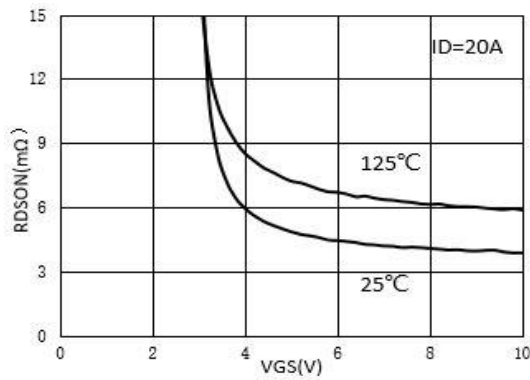


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

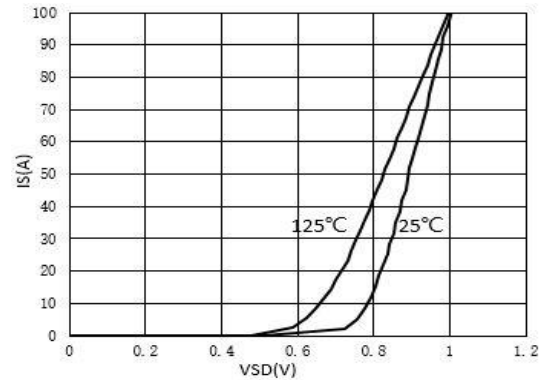


Figure 6: Body-Diode Characteristics (Note E)

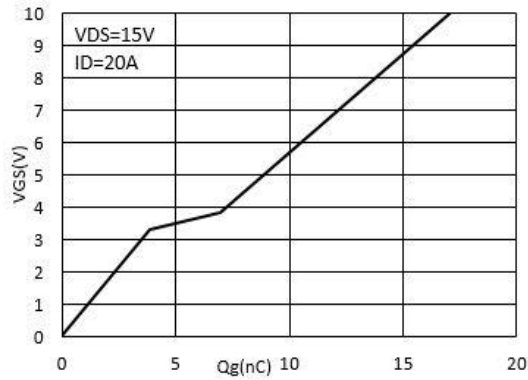


Figure 7: Gate-Charge Characteristics

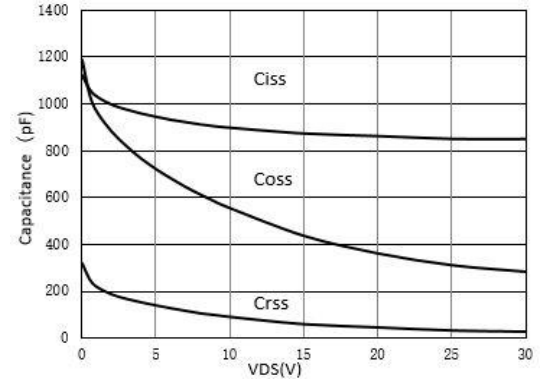


Figure 8: Capacitance Characteristics

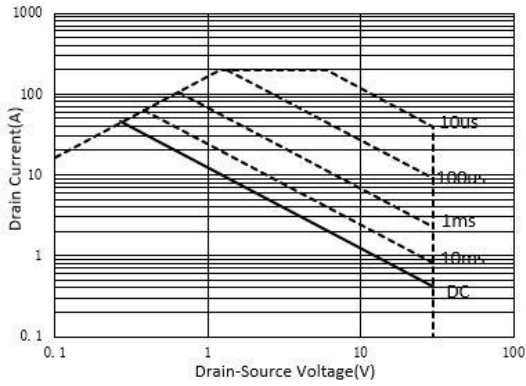


Figure 9: Maximum Forward Biased
Safe Operating Area

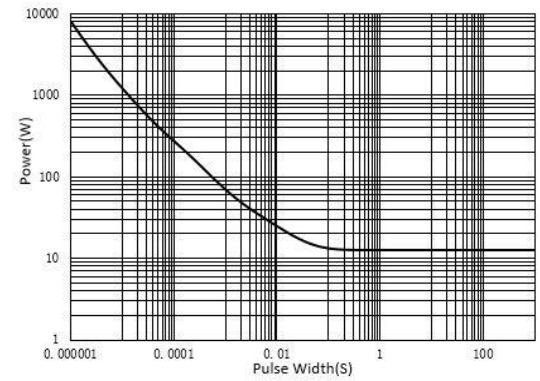
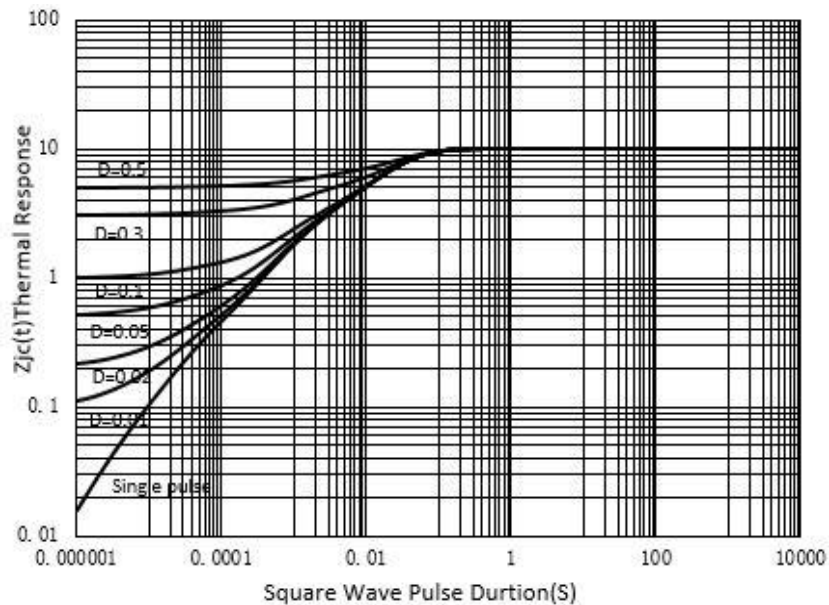
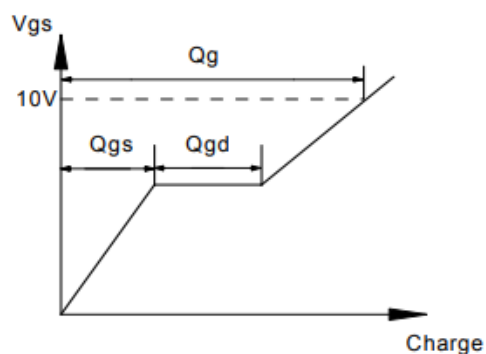
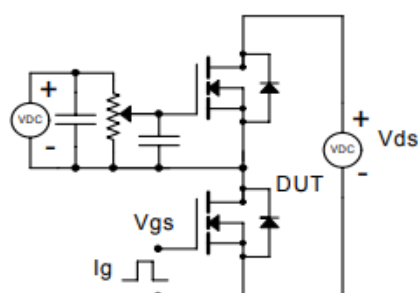


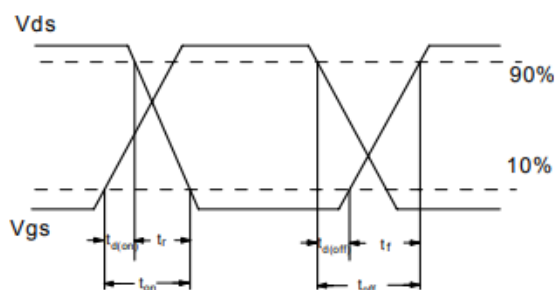
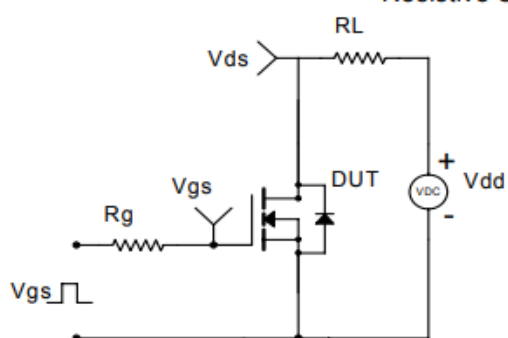
Figure 10: Single Pulse Power Rating
Junction-to-Case



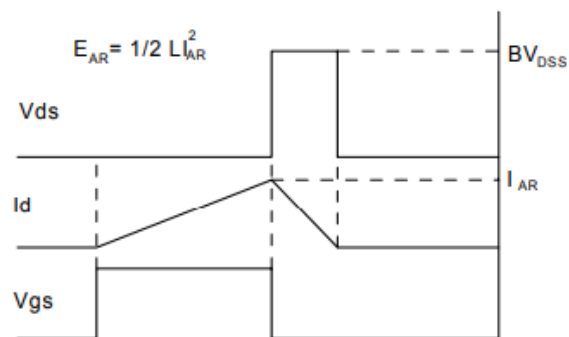
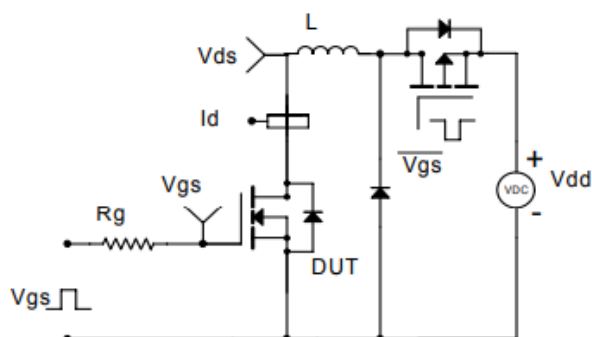
Gate Charge Test Circuit & Waveform



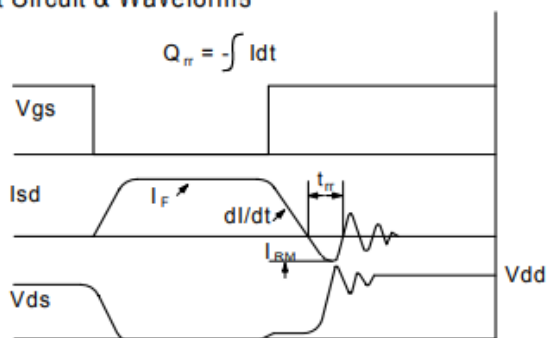
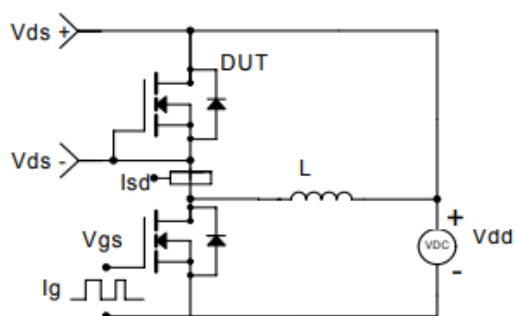
Resistive Switching Test Circuit & Waveforms



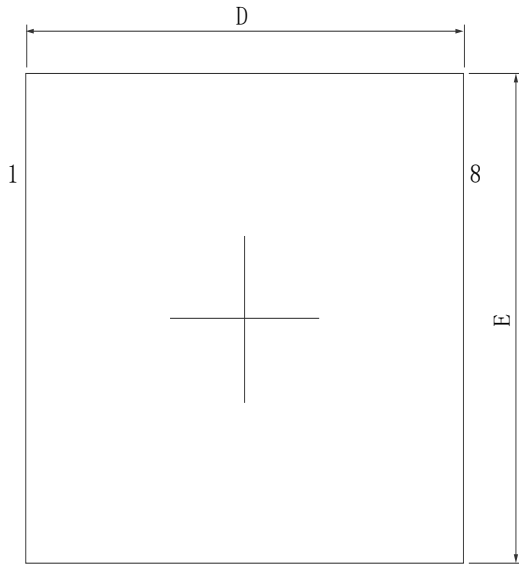
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



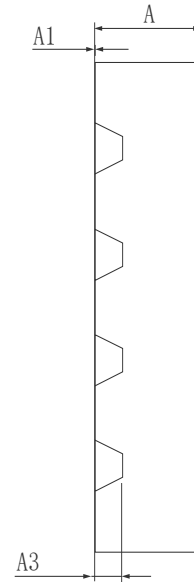
Diode Recovery Test Circuit & Waveforms



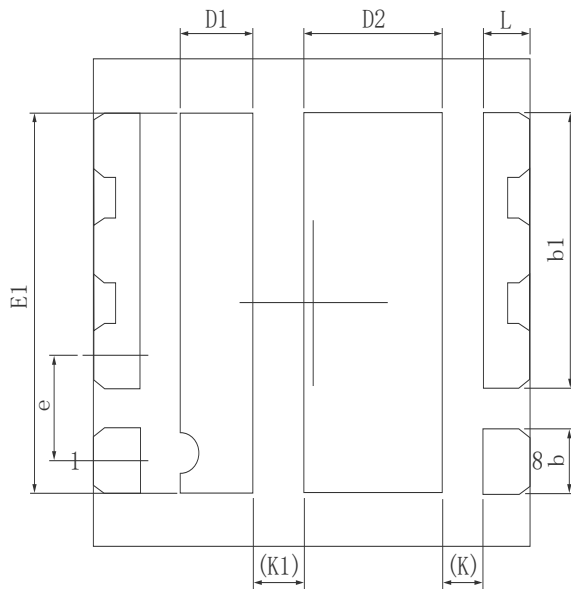
●Dimensions (WQFN3*3)



TOP VIEW
[顶视图]



SIDE VIEW
[侧视图]

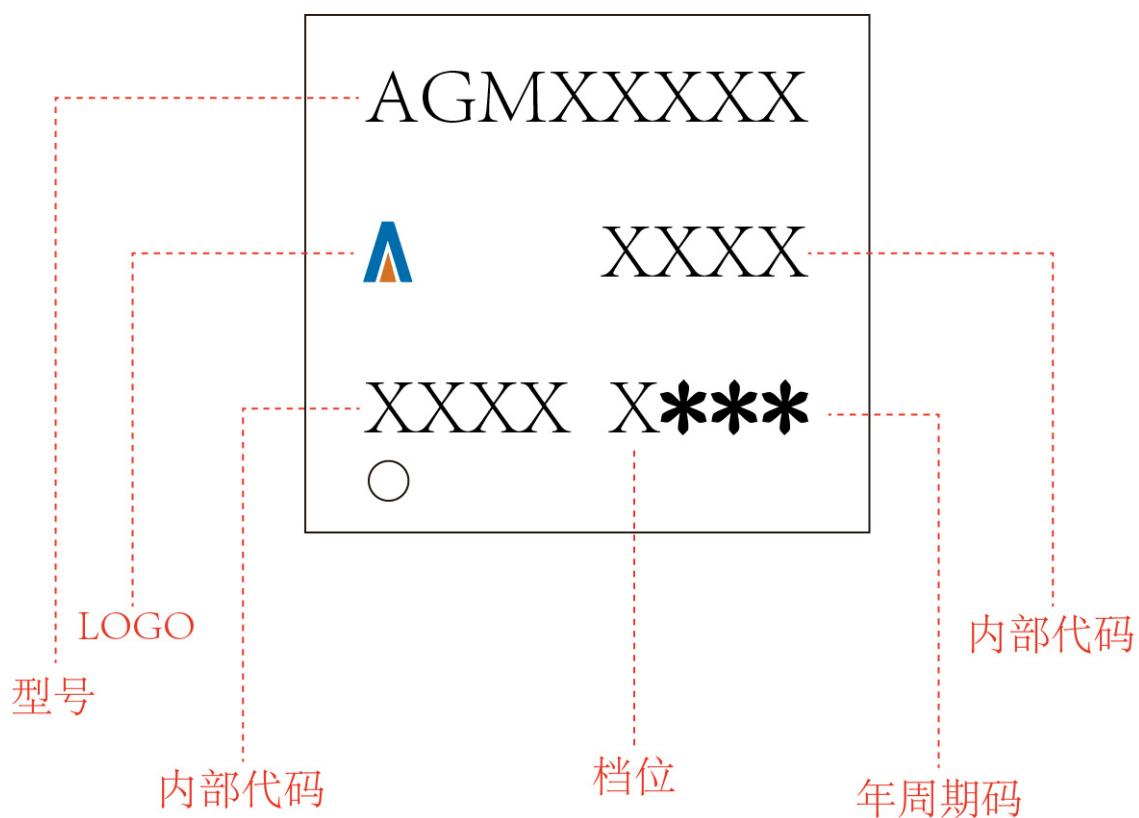


BOTTOM VIEW
[背视图]

SYMBOL	MIN	NOM	MAX
A	0.700	0.750	0.800
A1	0.000	0.020	0.050
A3	0.203 REF		
b	0.350	0.400	0.450
b1	1.600	1.700	1.800
D	2.900	3.000	3.100
E	2.900	3.000	3.100
e	0.650 BSC		
D1	0.400	0.500	0.600
D2	0.850	0.950	1.050
E1	2.225	2.325	2.425
L	0.220	0.320	0.420
K	0.280 REF		
K1	0.350 REF		

WQFN3*3

Marking Instructions:



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