General Description

The AGM40P65EL 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

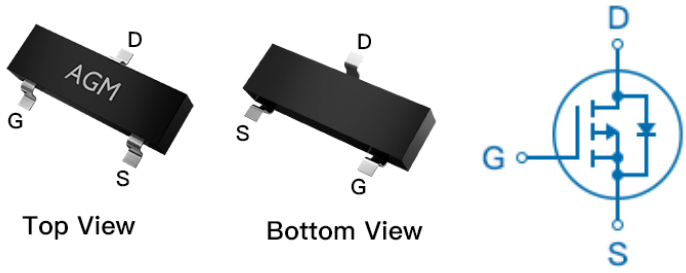
Application

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

Product Summary

BVDSS	RDSON	ID
-40V	63mΩ	-5A

SOT23 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
40P65	AGM40P65EL	SOT23	178mm	8mm	3000

Table 1. Absolute Maximum Ratings (TA=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	-40	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(TA=25℃) **(Note 1)**	-5	A
	Drain Current-Continuous(TA=70℃)	-3.0	A
IDM (pluse)	Drain Current-Pulsed **(Note 2)**	-20	A
PD	Maximum Power Dissipation(TA=25℃)	1.25	W
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State)[1]	---	100	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	-40	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-40V,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	-1.4	-2.2	V
gFS	Forward Transconductance	VDS=-5V,ID=-4A	--	-5	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-5A	--	63	75	mΩ
		VGS=-4.5V, ID=-4A	--	75	100	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-20V,VGS=0V, F=1MHZ	--	600	--	pF
Coss	Output Capacitance		--	90	--	pF
Crss	Reverse Transfer Capacitance		--	70	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-20V, RGEN=3Ω,ID=-3A	--	9	--	nS
tr	Turn-on Rise Time		--	8	--	nS
td(off)	Turn-Off Delay Time		--	25	--	nS
tf	Turn-Off Fall Time		--	9	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-20V, ID=-3A	--	14	--	nC
Qgs	Gate-Source Charge		--	2.9	--	nC
Qgd	Gate-Drain Charge		--	3.8	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-5.0	A
VSD	Forward on Voltage	VGS=0V,IS=-5A	--	--	-1.2	V
trr	Reverse Recovery Time	IF=-5A , dI/dt=100A/μs ,TJ=25℃	--	--	--	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℃

Typical Electrical and Thermal Characteristics

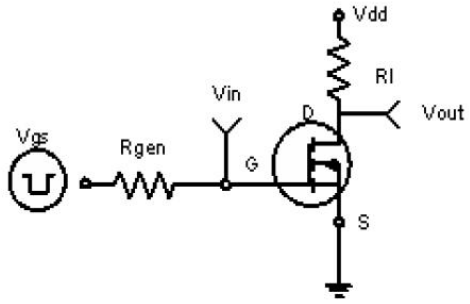


Figure 1:Switching Test Circuit

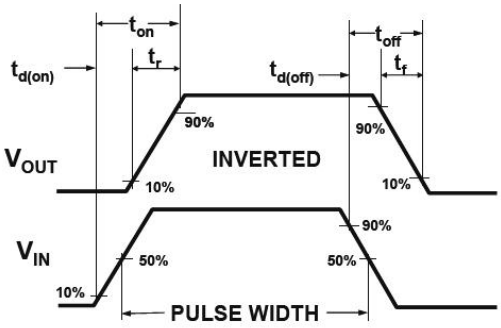


Figure 2:Switching Waveforms

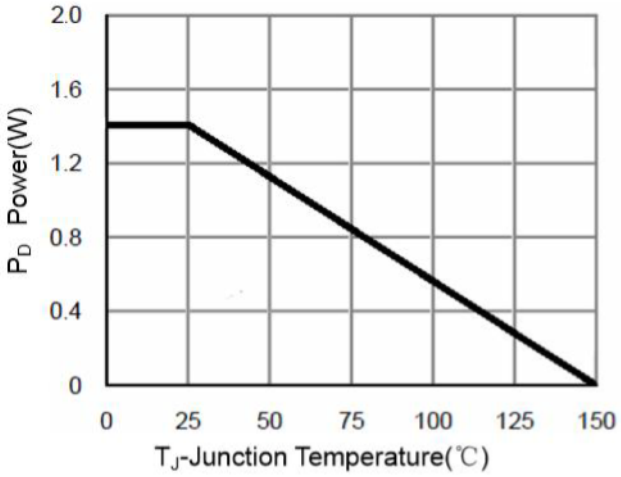


Figure 3 Power Dissipation

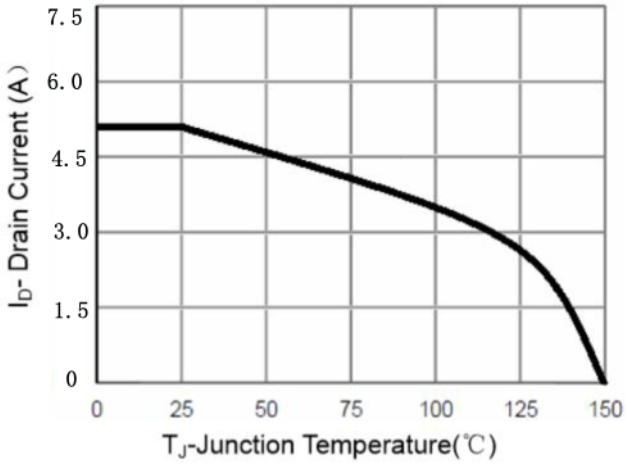


Figure 4 Drain Current

4.5

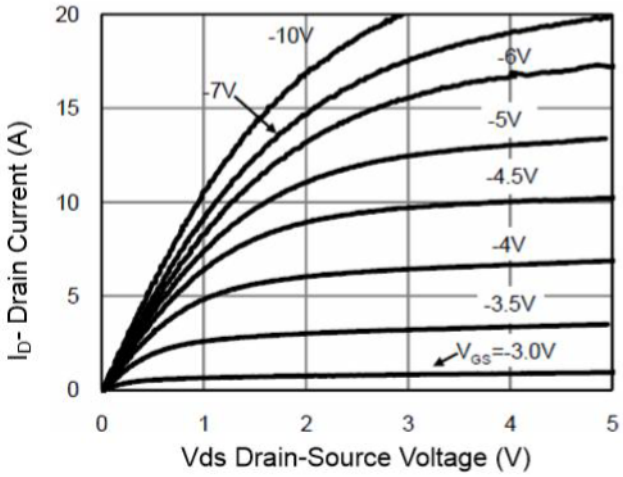


Figure 5 Output Characteristics

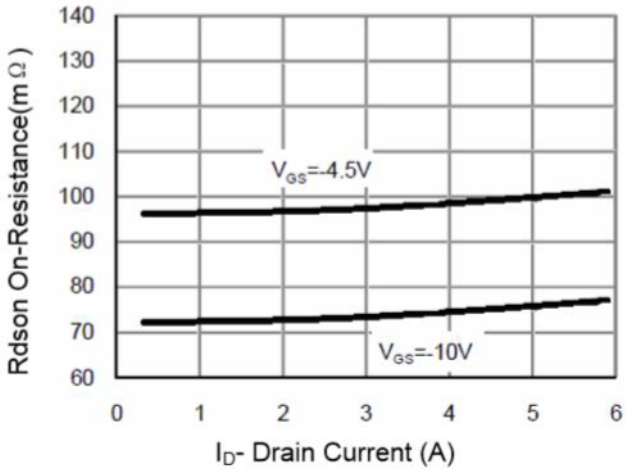


Figure 6 Drain-Source On-Resistance

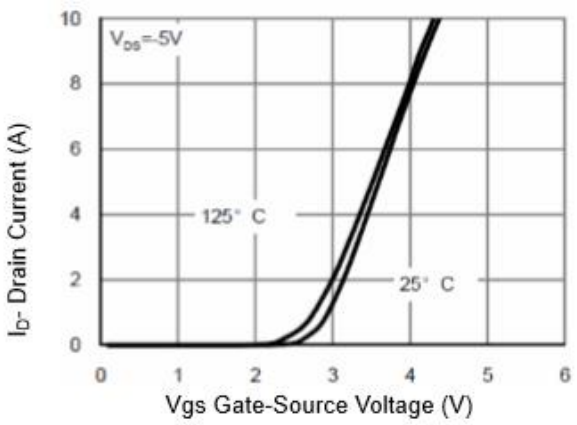


Figure 7 Transfer Characteristics

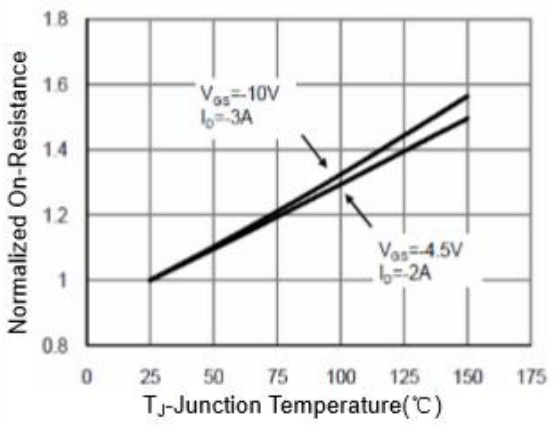


Figure 8 Drain-Source On-Resistance

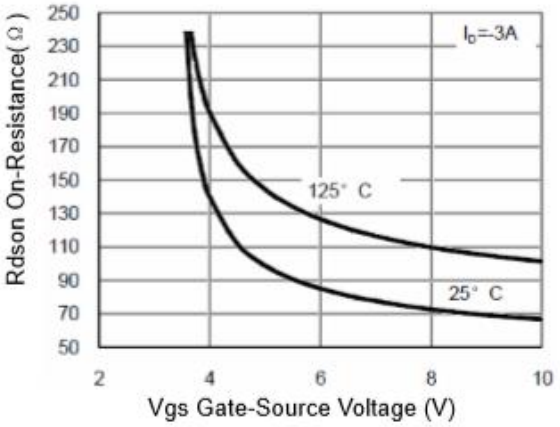


Figure 9 Rdson vs Vgs

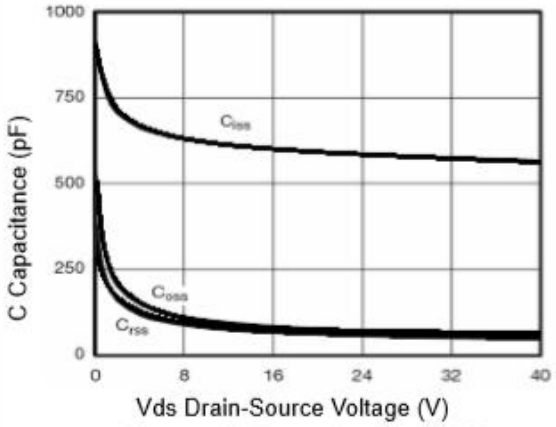


Figure 10 Capacitance vs Vds

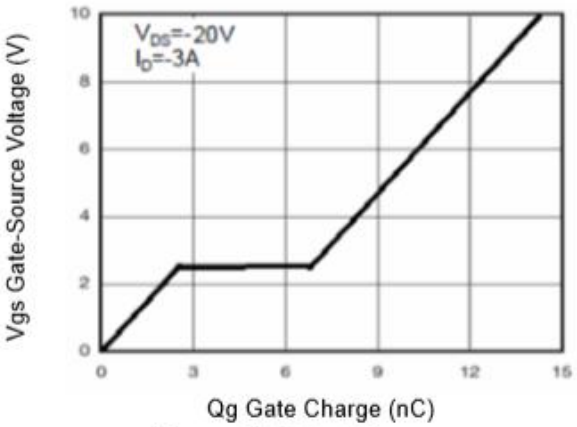


Figure 11 Gate Charge

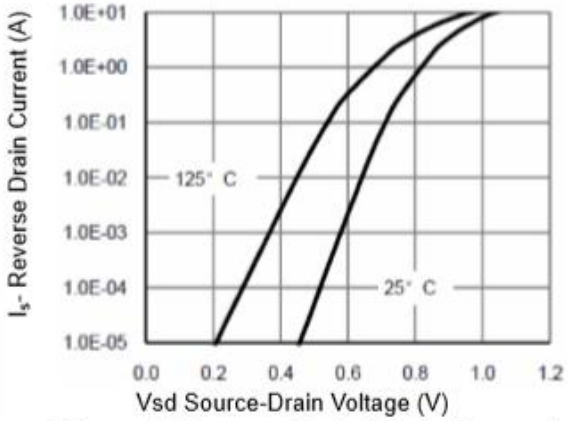


Figure 12 Source- Drain Diode Forward

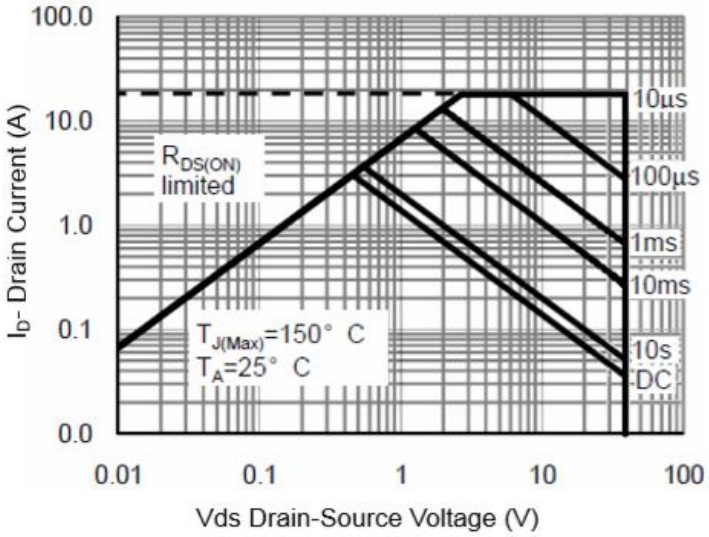


Figure 13 Safe Operation Area

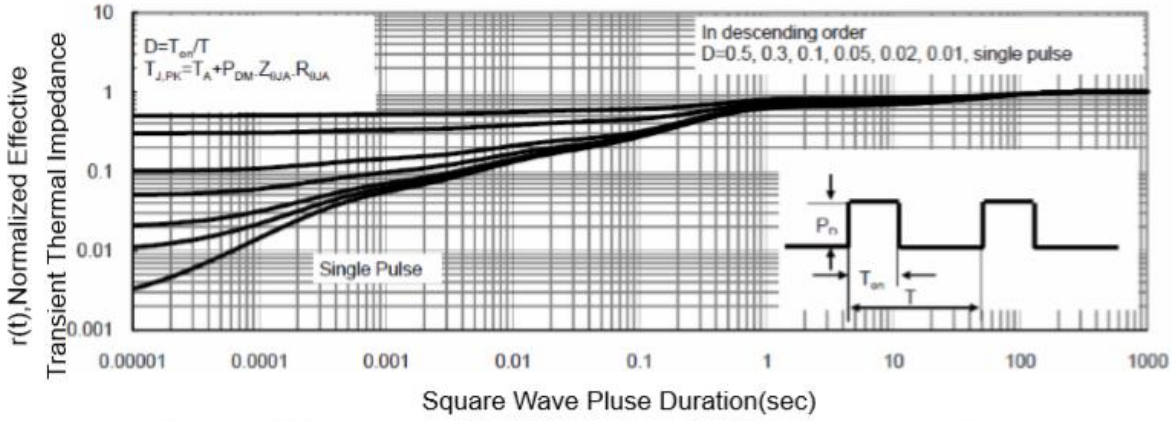
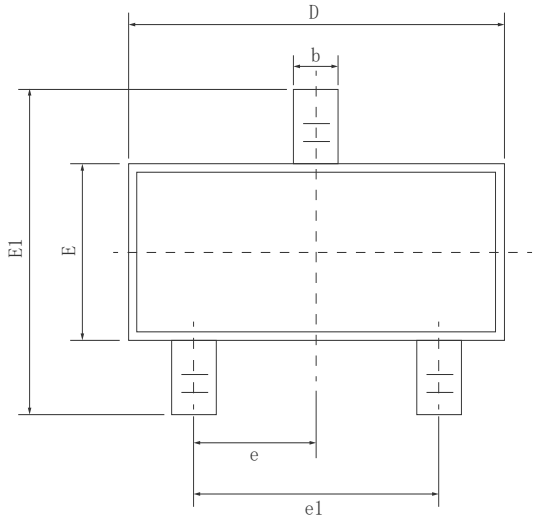
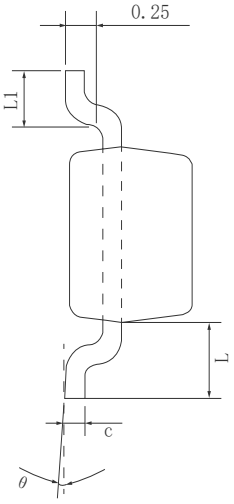


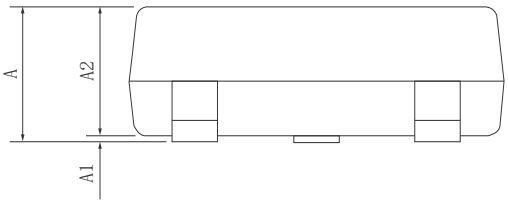
Figure 14 Normalized Maximum Transient Thermal Impedance

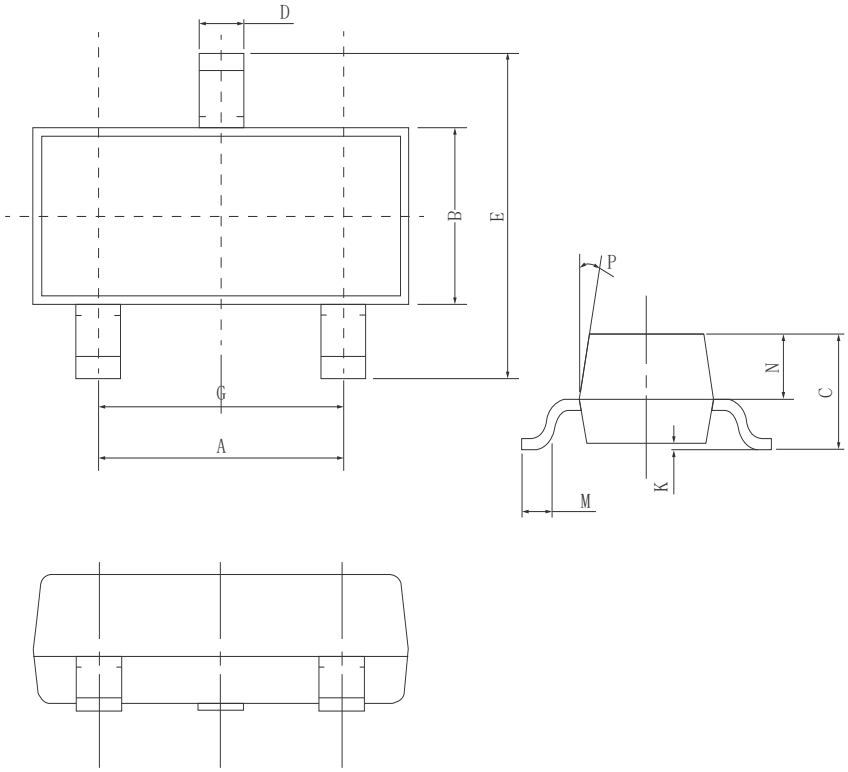
●Dimensions（SOT23）





SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.90	—	1.15
A1	0.00	—	0.10
A2	0.90	0.95	1.05
b	0.30	0.40	0.50
c	0.15	—	0.25
D	2.85	2.90	2.95
E	1.25	1.30	1.35
E1	2.25	2.40	2.55
e	0.95 TYP.		
e1	1.80	—	2.00
L	0.55 REF.		
L1	0.30	—	0.50
θ	0°	—	8°

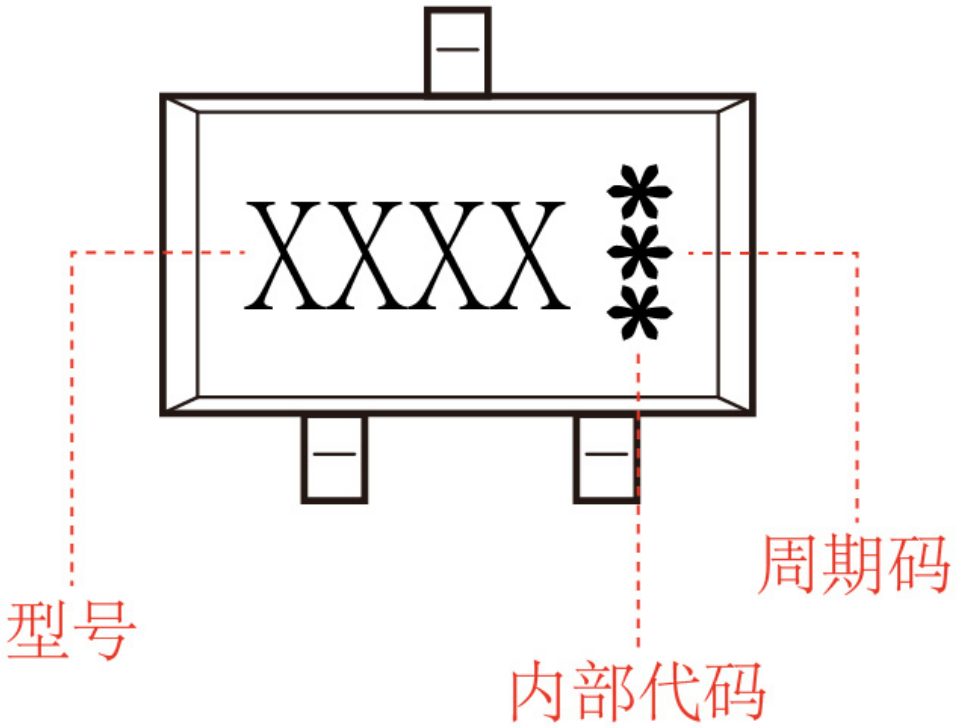




DIM	MILLIMETERS
A	2.90±0.1
B	1.30±0.10
C	0.90~1.15
D	0.40±0.10
E	2.40±0.15
G	1.90±0.10
K	0.00~0.10
M	0.30MIN
N	0.60±0.10
P	10° TYP

SOT23

Marking Instructions:



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This document is the fourth version issued on April 20th, 2024. This document replaces all previously provided information.