# B C Sa APM16S M a a S -B PFC SCD

# FAM65CR51ADZ1, FAM65CR51ADZ2

Features

Integrated SIP or DIP Boost Converter Stage Power Module for On–board Charger (OBC) in EV or PHEV

#### ORDERING INFORMATION

Part Number	Package	Lead Forming	DBC Material	Pb-Free and RoHS Compliant	Operating Temperature (T <sub>A</sub> )	Packing Method
FAM65CR51ADZ1	APM16-CDA	Y–Shape	Al2O3	Yes	–40°C ~ 125°C	Tube
FAM65CR51ADZ2	APM16-CDB	L–Shape	Al2O3	Yes	–40°C ~ 125°C	Tube

#### Pin Configuration and Description

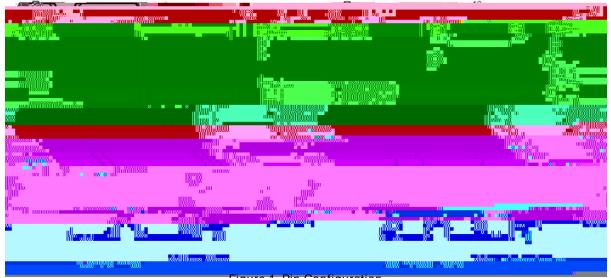


Figure 1. Pin Configuration

#### Table 1. PIN DESCRIPTION

Pin Number

Pin Name

Pin Description

### INTERNAL EQUIVALENT CIRCUIT

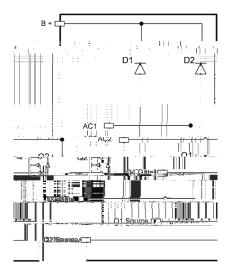


Figure 2. Internal Block Diagram

Symbol	Parameter	Max	Unit
V <sub>DS</sub> (Q1~Q2)	Drain-to-Source Voltage	650	V
V <sub>GS</sub> (Q1~Q2)	Gate-to-Source Voltage	20	V
I <sub>D</sub> (Q1~Q2)	Drain Current Continuous ( $T_C = 25^{\circ}C$ , $V_{GS} = 10$ V) (Note 1)	41	A
	Drain Current Continuous ( $T_C = 100^{\circ}C$ , $V_{GS} = 10 \text{ V}$ ) (Note 1)	25	A
E <sub>AS</sub> (Q1~Q2)	Single Pulse Avalanche Energy (Note 2)	623	mJ
PD	Power Dissipation (Note 1)	189	W
TJ	Maximum Junction Temperature	-55 to +150	°C
T <sub>C</sub>	Maximum Case Temperature	-40 to +125	°C
T <sub>STG</sub>	Storage Temperature	-40 to +125	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
Maximum continuous current and power, without switching losses, to reach T<sub>J</sub> = 150°C respectively at T<sub>C</sub> = 25°C and T<sub>C</sub> = 100°C; defined by design based on MOSFET R<sub>DS(ON)</sub> and R<sub>θJC</sub> and not subject to production test
Starting T<sub>J</sub> = 25°C, I<sub>AS</sub> = 6.5 A, R<sub>G</sub> = 25 Ω

#### **DBC Substrate**

0.63 mm Al2O3 alumina with 0.3 mm copper on both sides.

### PARAMETER DEFINITIONS

## Reference to Table 3: Parameter of MOSFET Electrical Specifications

BV <sub>DSS</sub>	Q1, Q2 MOSFET Drain-to-Source Breakdown Voltage The maximum drain-to-source voltage the MOSFET can endure without the avalanche breakdown of the body- drain P-N junction in off state. The measurement conditions are to be found in Table 3. The typ. Temperature behavior is described in Figure 13
V <sub>GS(th)</sub>	Q1, Q2 MOSFET Gate to Source Threshold Voltage The gate-to-source voltage measurement is triggered by a threshold ID current given in conditions at Table 4. The typ. Temperature behavior can be found in Figure 10
R <sub>DS(ON)</sub>	

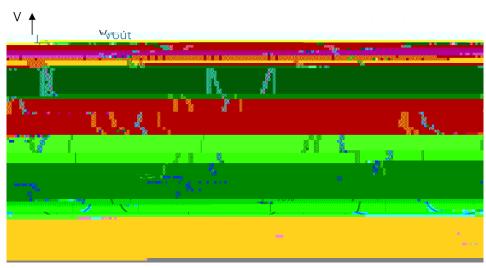
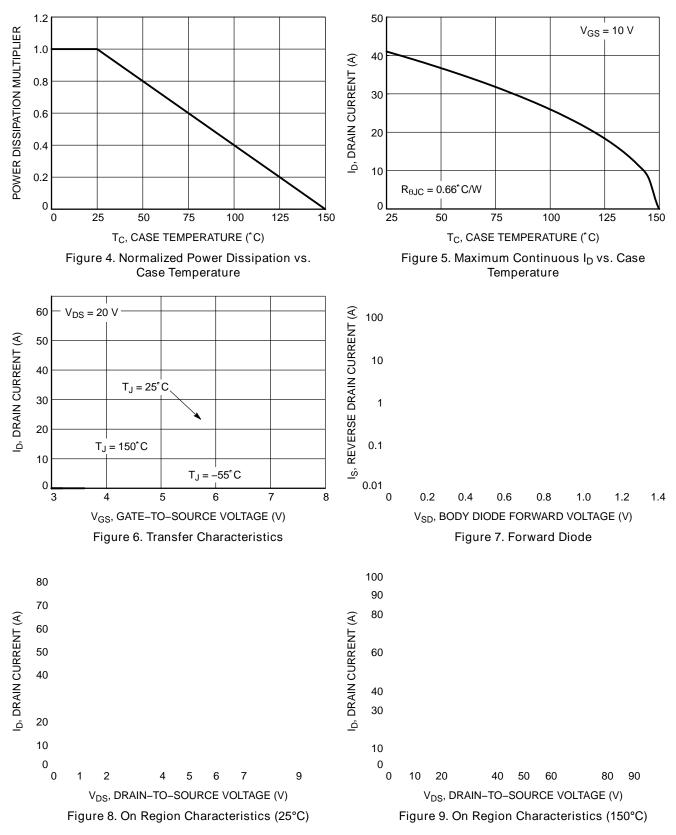


Figure 3. Timing Measurement Variable Definition

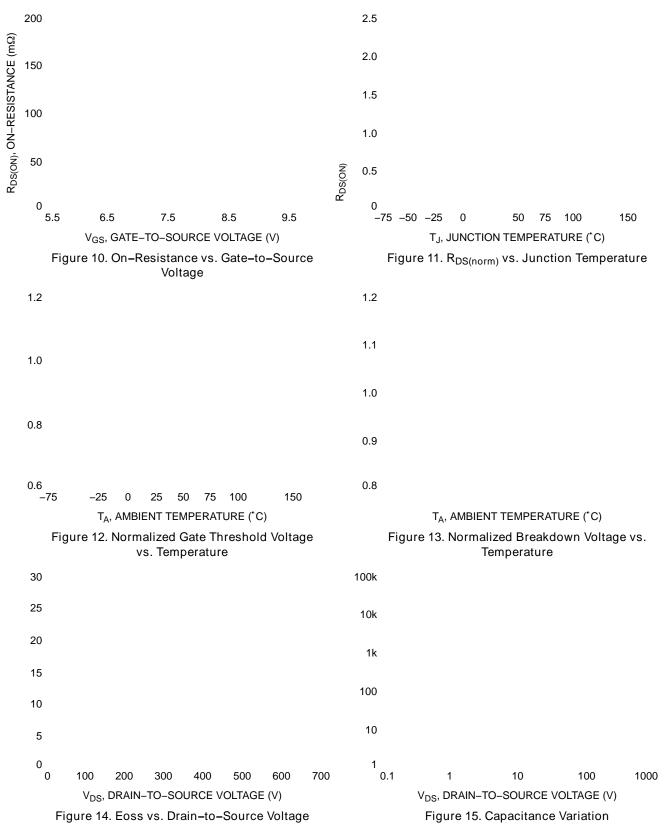
#### Table 8. PARAMETER OF SWITCHING CHARACTERISTICS

Turn–On Delay (t <sub>d(on)</sub> )	This is the time needed to charge the input capacitance, Ciss, before the load current ID starts flowing. The measurement conditions are described in the Table 3. For signal definition please check Figure 3 above.
Rise Time (t <sub>r</sub> )	The rise time is the time to discharge output capacitance, Coss. After that time the MOSFET conducts the given load current ID



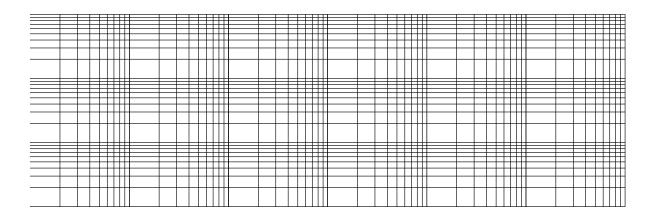


#### TYPICAL CHARACTERISTICS - MOSFETs



TYPICAL CHARACTERISTICS - MOSFETs

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## TYPICAL CHARACTERISTICS – DIODES

### APMCD-A16 / 12LD, AUTOMOTIVE MODULE



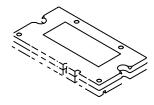
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1. DIMENSIONING

SION: MILLIMETERS

GENERIC MARKING DIAGRAM\*

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#### APMCD-B16 / 12LD, AUTOMOTIVE MODULE CASE MODGK ISSUE D

DATE 04 NOV 2021

#### GENERIC MARKING DIAGRAM\*

\*This information is generic. Please refer to device data sheet for actual part marking. Pb–Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

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