RC-D2 family for refrigerators

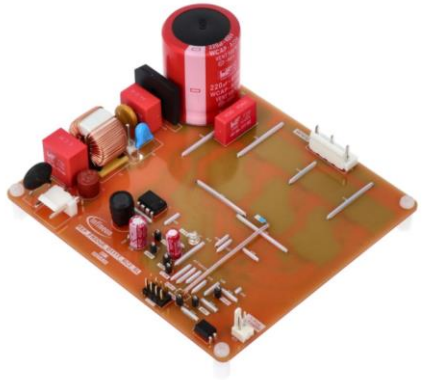
October 2022

Refrigerators and freezers – Product overview

Fridge

- **Motor controller:** PSoC™, XMC™ and **iMOTION™** family
- **Inverter (Discrete):** IGBTs (650 V TRENCHSTOP™ IGBT6 & **RC-D2** series), MOSFETs (CoolMOS™ PFD7) and gate drivers (e.g. EiceDRIVER™)
- **Inverter** (integration): CIPOS™ Micro IPMs
- **PFC**: TRENCHSTOP™ IGBTs, Rapid and CoolSiC™ diodes, PFC gate drivers
- **Auxiliary power**: CoolSET™

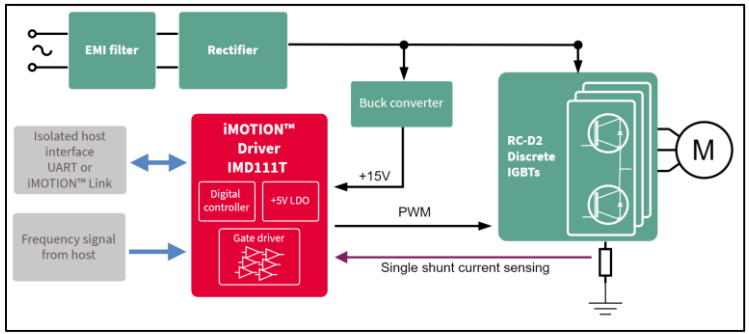
Energy Efficiency



Connectivity

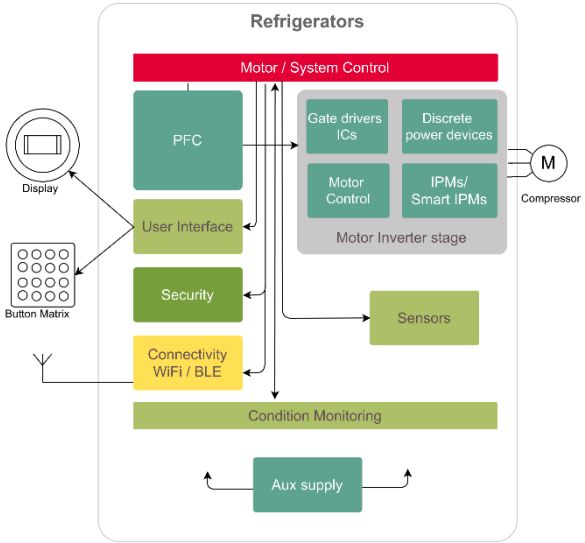
- AIROC™ Combo Bluetooth / Wi-Fi **connectivity**
- XENSIV™ MEMS microphone for **voice control**
- OPTIGA™ Trust M for **secured communication**
- PSOC™ 6 microcontroller

IoT

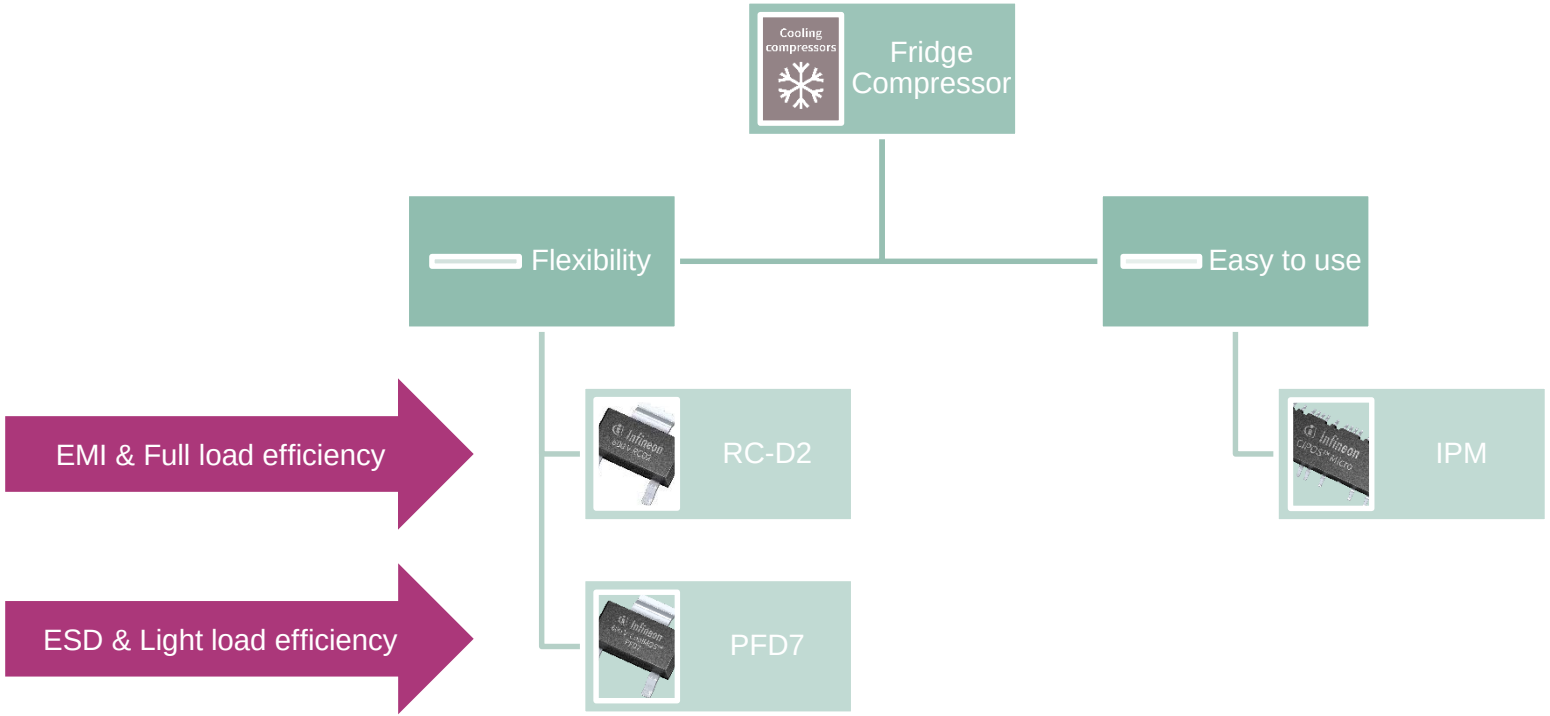


Modern refrigerators brings higher energy efficiency and connectivity features

Featuring **higher efficiency** and **smart connectivity** modern refrigerators can help to reduce waste of energy as well as waste of food



RC-D2 offers high flexibility & efficiency fulfilling EMI standards



600 V RC-D2 for fridges
Optimized for low power drive <300 W

Key features 600 V RC-D2		Key value
New price/ performance standard	Optimized for consumer drives	**Great** trade-off between price and performance
Broad portfolio	DPAK: offered in 4 variants with a collector current IC ranging from 4 to 15 A; SOT-223 package variants ranging from 1 to 6 A	Drop in **replacement**
Improved EMI	Enhanced controllability to reduce EMI noise compared to previous RC-D technologies	**Easy to design in**
HV-H3TRB ruggedness	HV humidity ruggedness improvement to protect the system	**High system reliability**

Package comparison
RC-D2 in DPAK vs RC-D2 in SOT-223

TO-252 DPAK	SOT-223
	
Area: **~75 mm²**	Area: **49 mm²**

Higher power density
Less printed circuit board space

35% shrink in length
25% shrink in height

When to use which package type in fridge application?

600 V RC-D2
price competitive

Supersedes IKDxxN60RF

Low price required

DPAKs
IKDxxN60RC2

Form factor and/or lower price required

SOT-223s
IKNxxN60RC2

600 V RC-D2 is recommended as price competitive solution to supersede the existing 600 V RC-D(F) product family for low power fridge applications

RC-D2 portfolio for fridges

TRENCHSTOP™ RC-D2 family is the successor of TRENCHSTOP™ and RC-D(F) product lines.

IGBTs with monolithically integrated diode

Ic 100°C	SOT-223	DPAK
	RC-D2	RC-D2
1	IKN01N60RC2	
3	IKN03N60RC2	
4	IKN04N60RC2	IKD04N60RC2
6	IKN06N60RC2	IKD06N60RC2
8		
10		IKD10N60RC2
15		IKD15N60RC2
20		

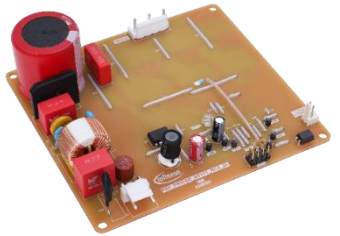
Recommended drivers:

Half-bridge:
2ED2304S06F, IRS2890DS

A reference design, which enables designing cost effective compressor drives for refrigerators without motor control development

Overview

- Turnkey motor control with the field-proven MCE (Motor Control Engine) that eliminates the need for motor control software development
- Single-layer PCB for lowest manufacturing costs
- Proven thermal design and EMI compatibility
- Features RCD2-600 V IGBTs with the monolithically integrated diode for lowest EMI and losses and maximum design flexibility



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Target application

- Refrigerators

Key featured products

- **IMD111T-6F040 iMOTION™ driver** integrating motor controller and 600 V three phase gate driver in LQFP-40 package
- **IKD04N60RC2**, a 600 V, 4 A IGBT Discrete with Reverse Conducting Drive 2-diode in TO-252 package

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