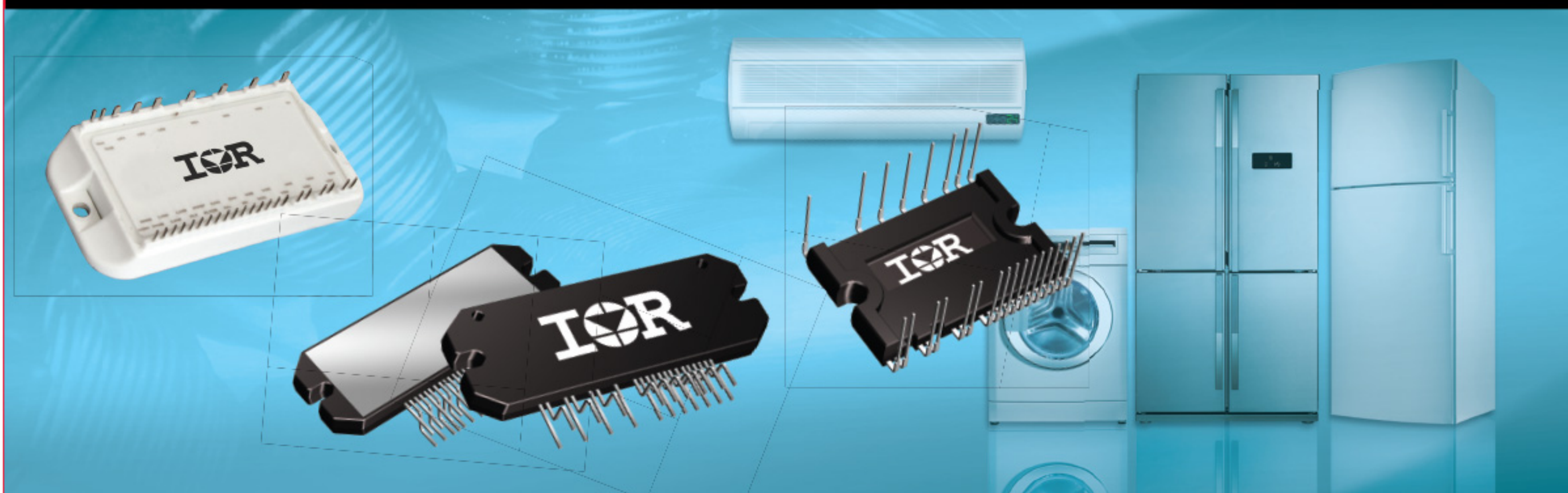


Appliance Motor Drive IPM Product Selection Guide



Cooler - Smaller - Cheaper - Simpler - Smarter



WWW.IRF.COM

International
IOR Rectifier

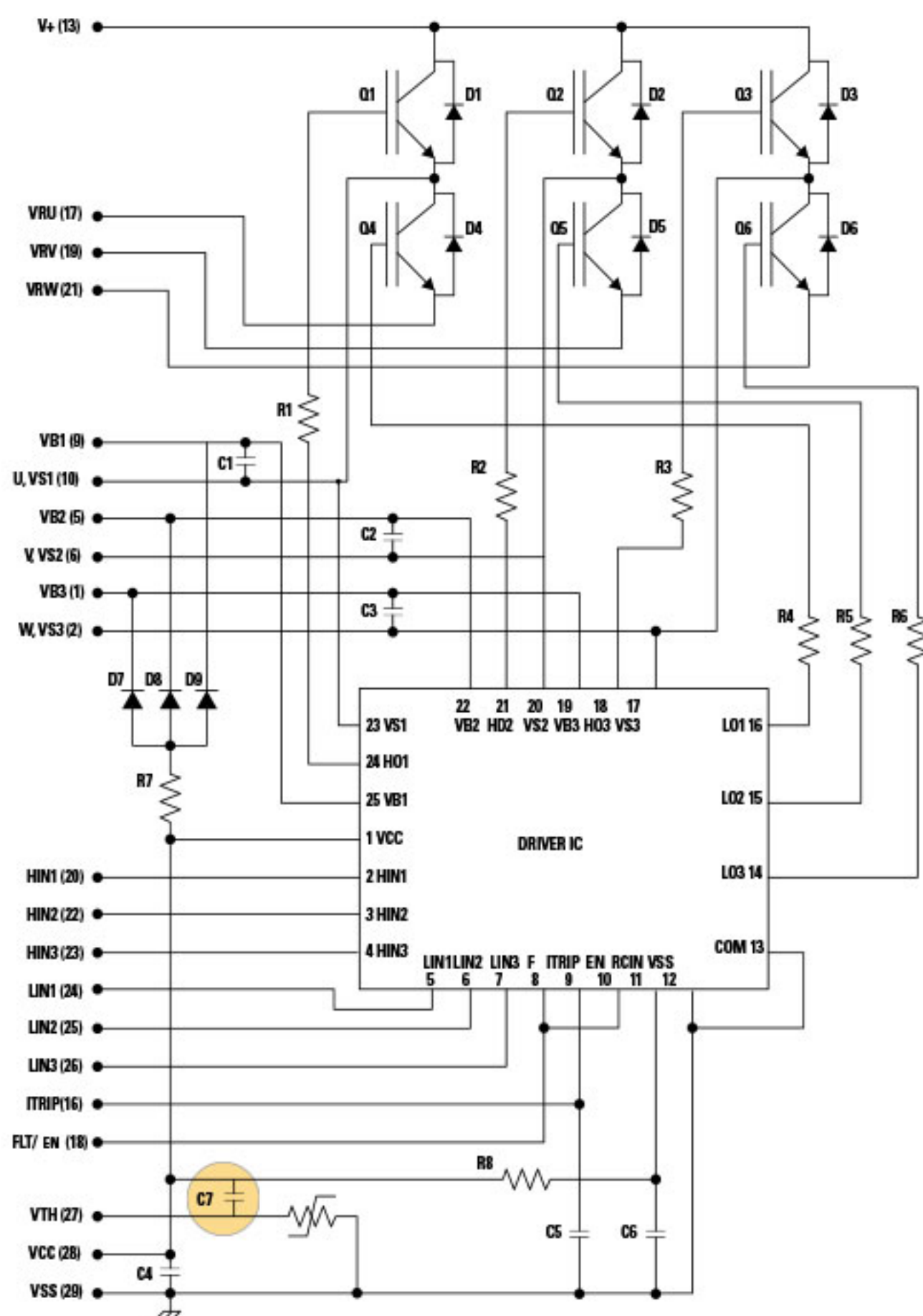
AN INFINEON TECHNOLOGIES COMPANY

IR's New SIP: *IRAM Gen2* Inverter Modules

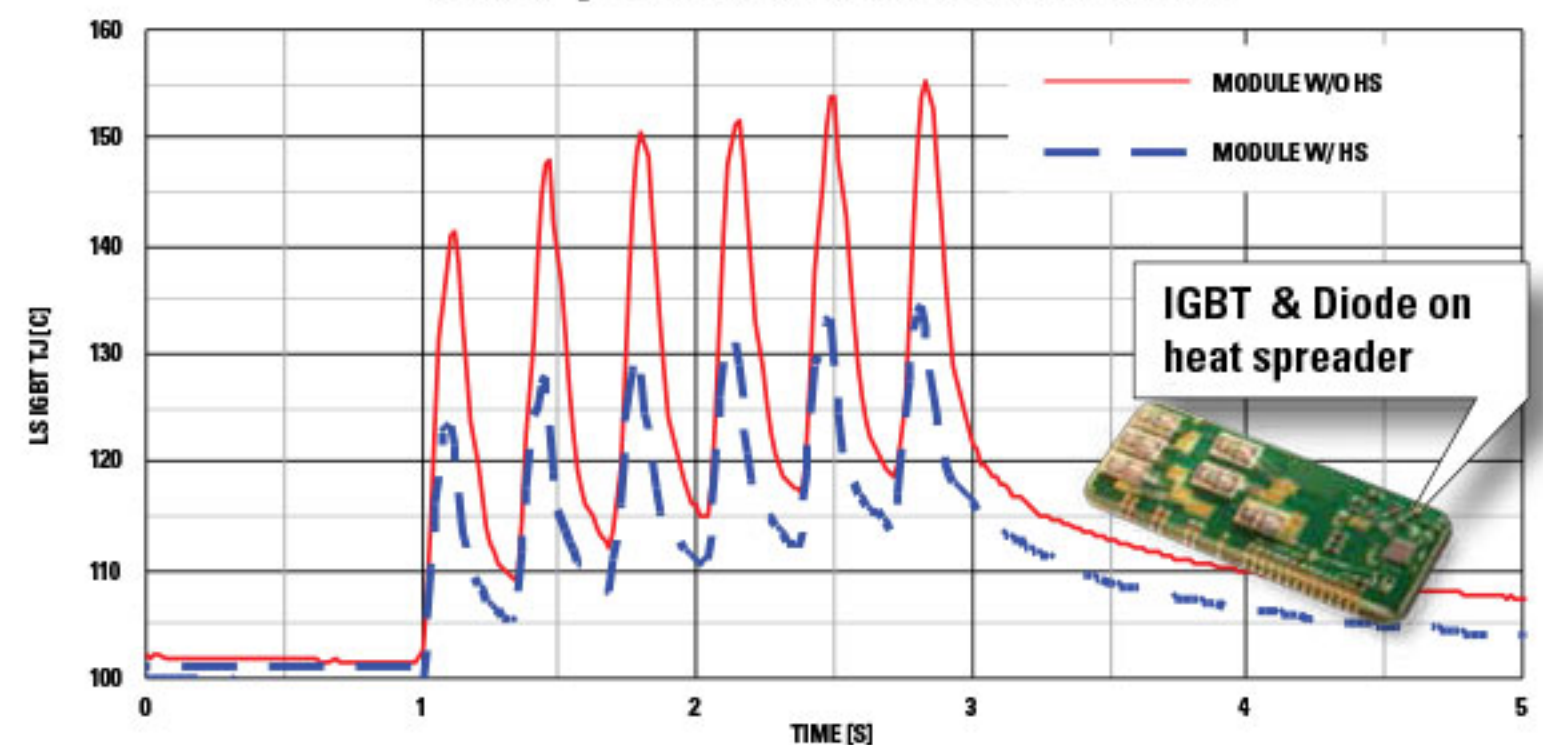
Improving the industry standard benchmark was not an easy task but the new *IRAM Gen2* platform utilizes state-of-the-art technology for next-generation **IRAM System-In-Package (SIP)**, appliance motor drive intelligent power modules. The new platform has been designed to address the demand for more efficient motor drives for appliance applications with particular attention to thermal performance and electromagnetic noise.

- Pin to Pin compatible with existing IRAM SiP1A series
- Exposed back side improves thermal performance
- Advanced Trench IGBT and next-generation 3-phase gate driver
- Extended operating case temperature
- 100% IR assembly line and IR silicon

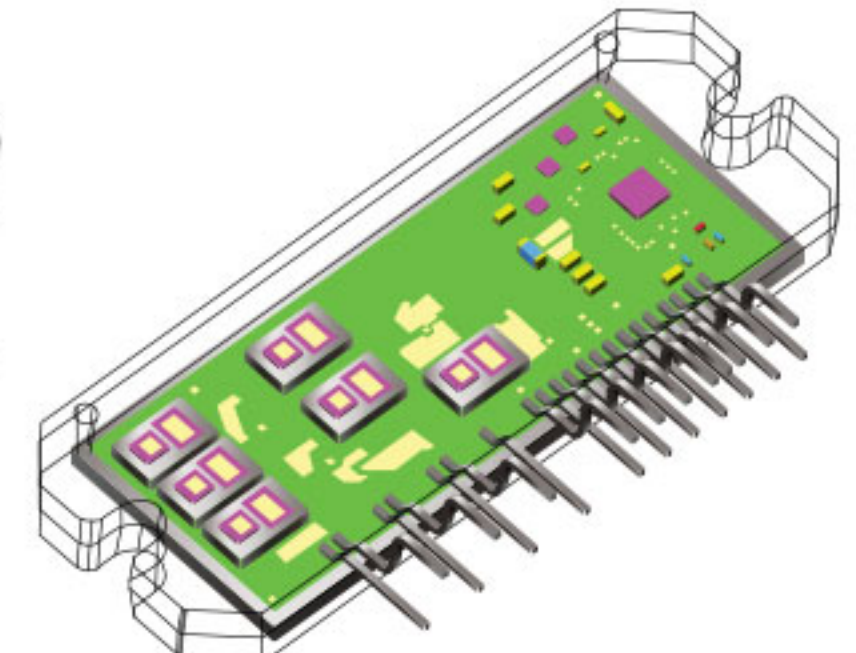
Voltage (V)	Nominal Current		Configuration	Topology Feature	Motor Current RMS, at Tc=100°C Vdc=320V			Package	Typical Motor Load (W)	Good for New Designs
	Io (RMS)@ Tc= 25°C (A) RMS	@ (kHz)	Open Emitter		3P Sinus 6kHz PWM (A) RMS	3P Sinus 16kHz PWM (A) RMS	2P Sinus 16kHz PWM (A) RMS			
600	8	6	IRAM256-0867A(2)		5.9	4.6	5.5	SIP1A+	750	✓
	10	6	IRAM256-1067A(2)		6.8	5.3	6.4	SIP1A+	1000	✓
	15	6	IRAM256-1567A(2)		8.4	6.5	7.8	SIP1A+	1500	✓
	20	6	IRAM256-2067A(2)		10.4	8.1	9.7	SIP1A+	2000	✓
	15	6	IRAM722-1562F	PFC (20kHz) + Inverter	5.6	4.3	5.2	SIP2A+	1000	✓
	15	6	IRAM722-1562F	PFC (133kHz) + Inverter	5.6	5.4	6.5	SIP2A+	700	✓



50% Reduction!

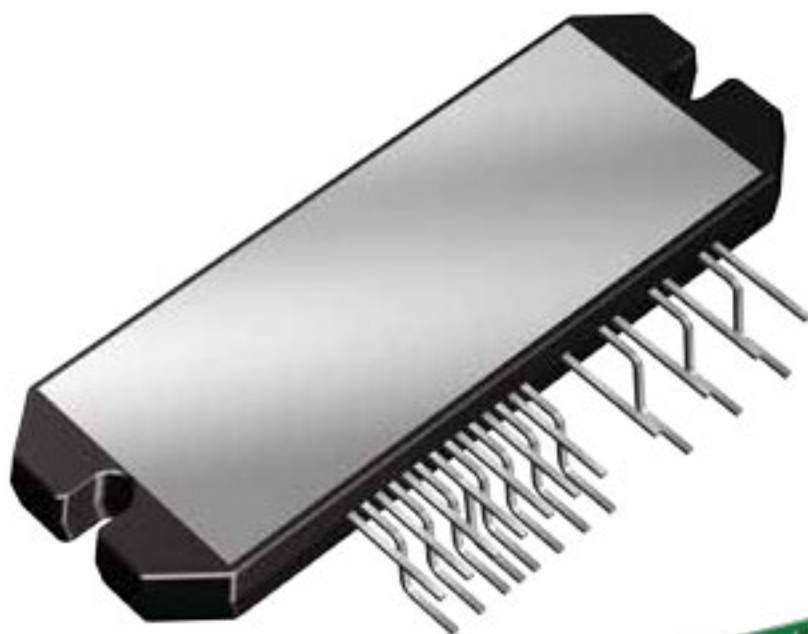
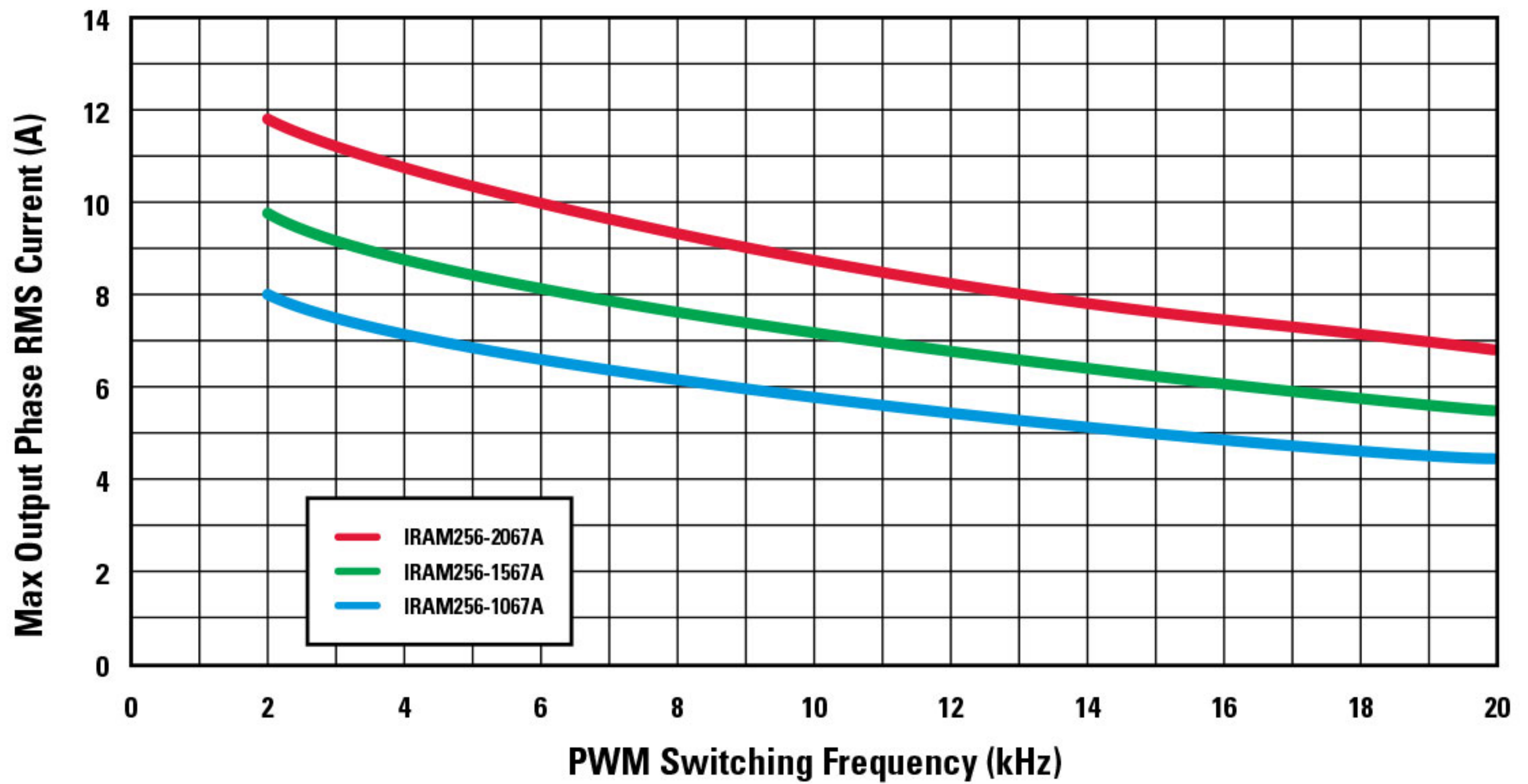


3-Phase Inverter

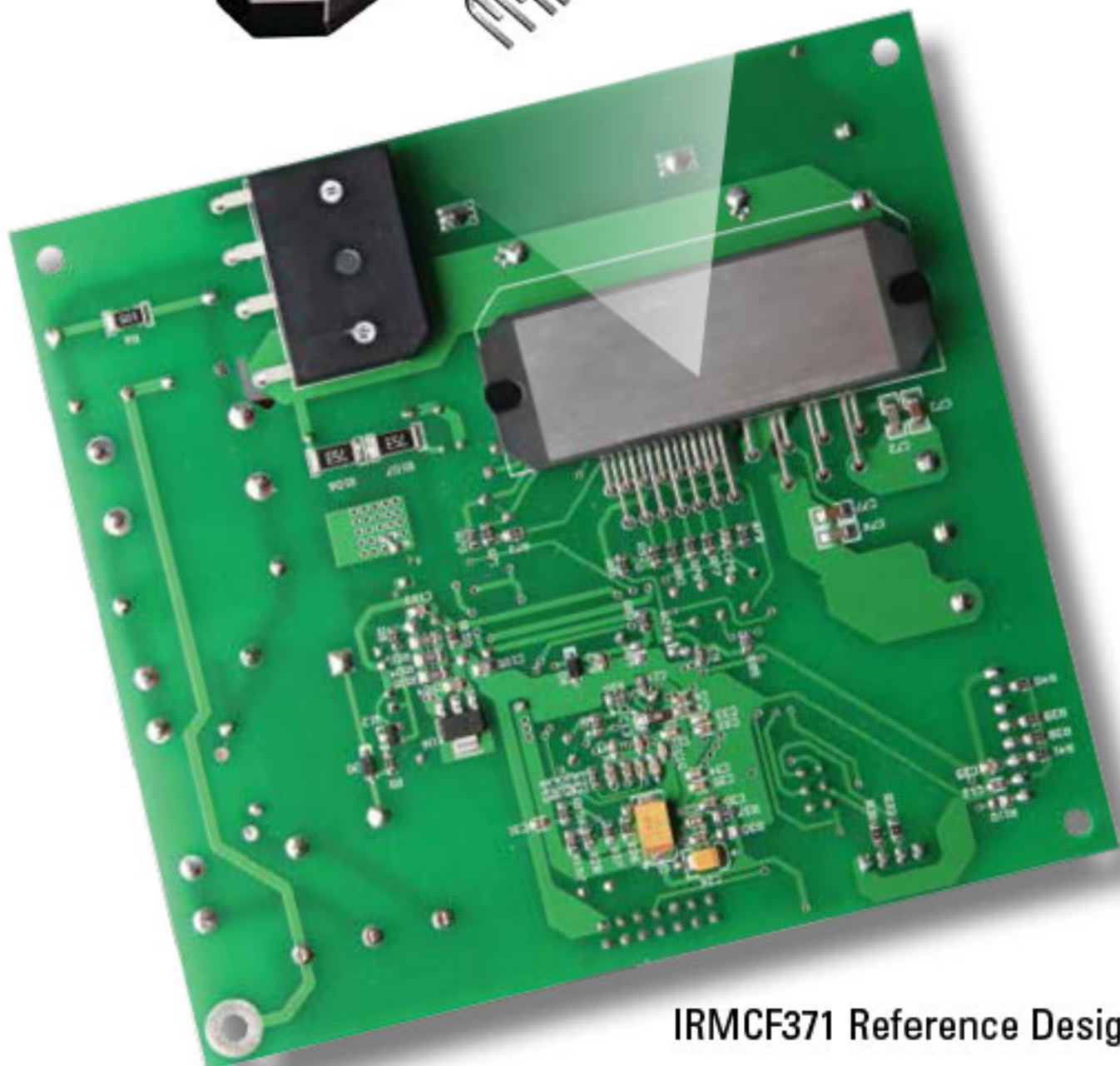


IGBT & Diode on heat spreader (6x)

IRAM Current vs Frequency

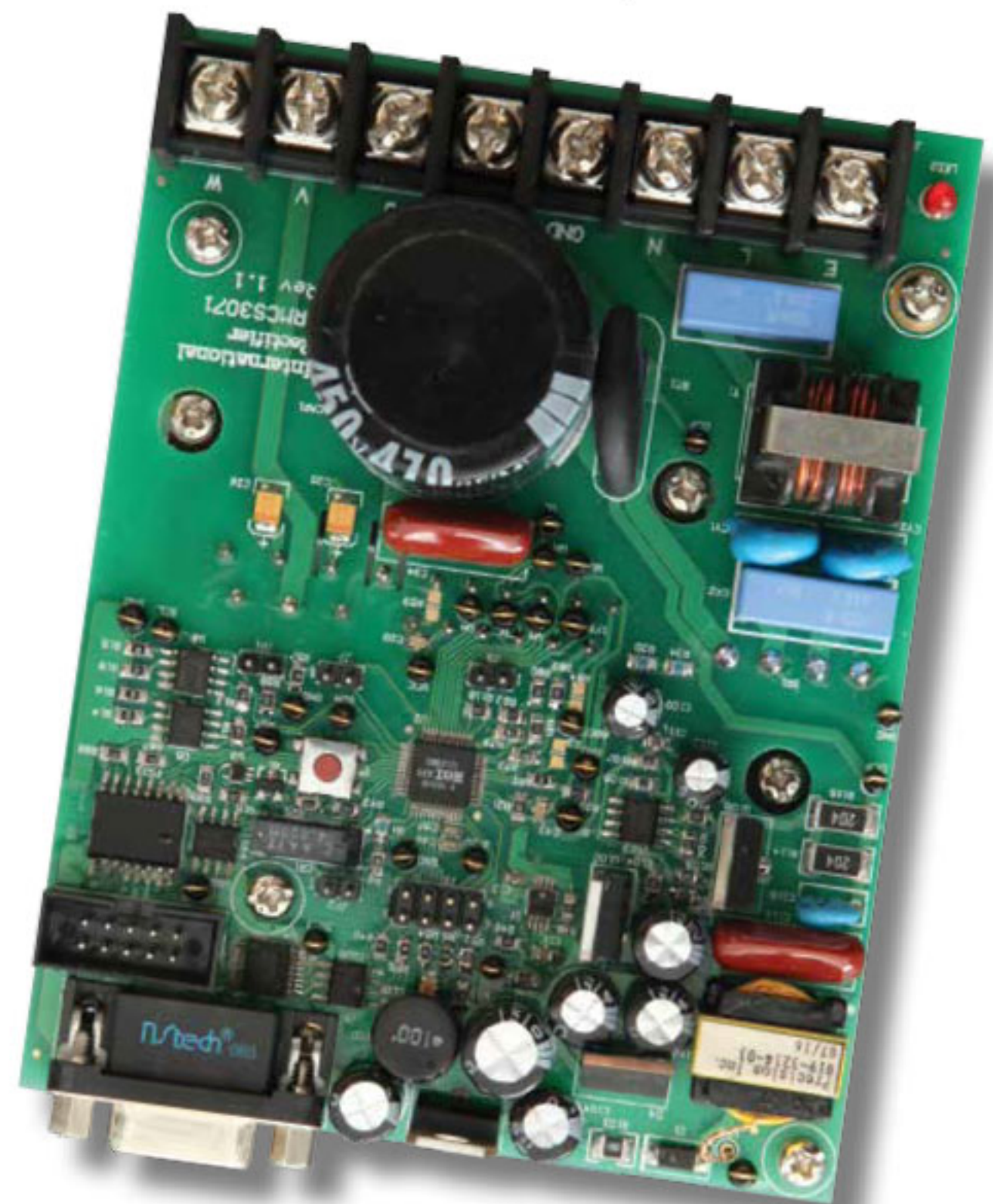


Exposed IMS



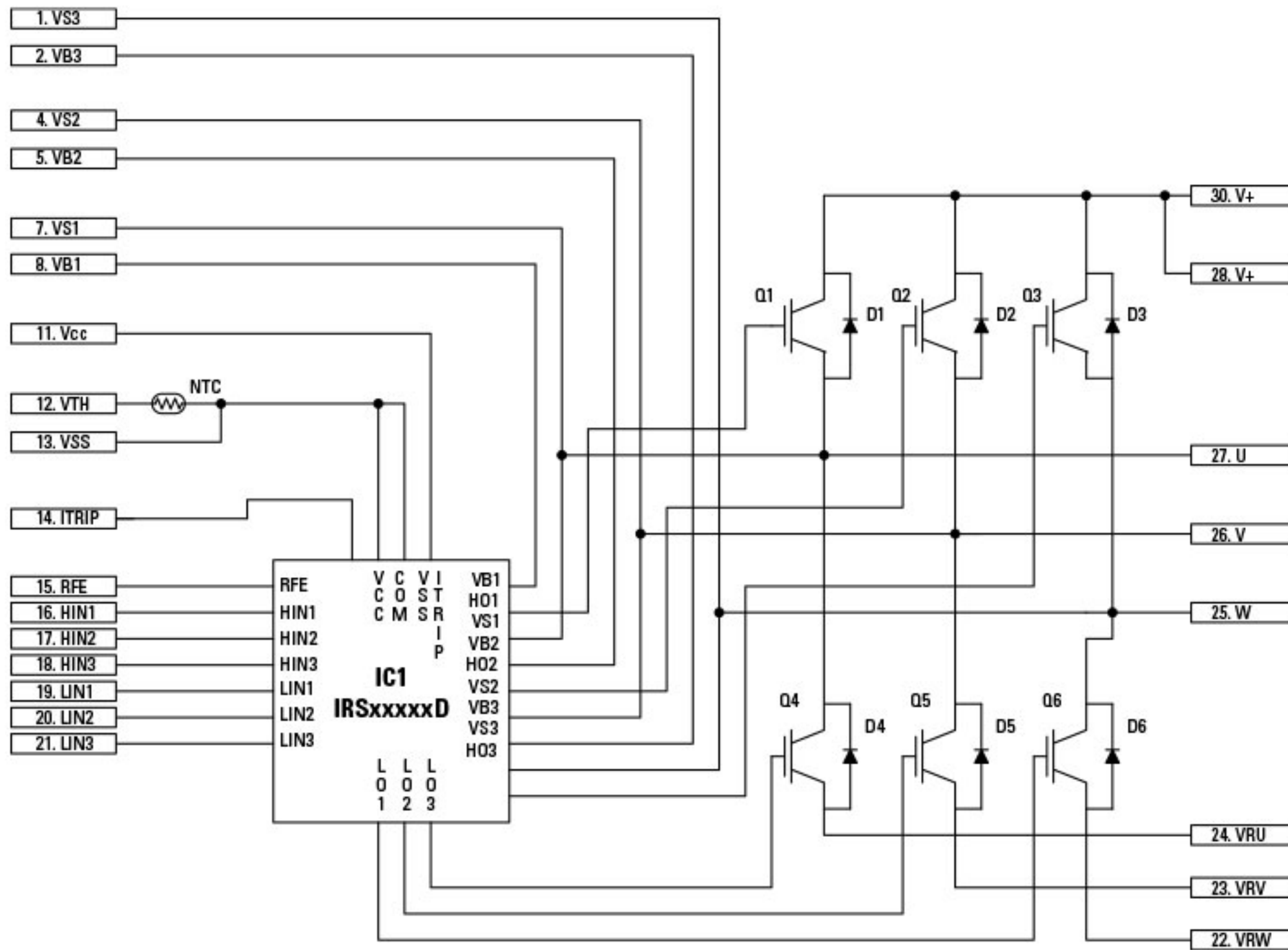
IRMCF371 Reference Design

IRMCS3071 Reference Design

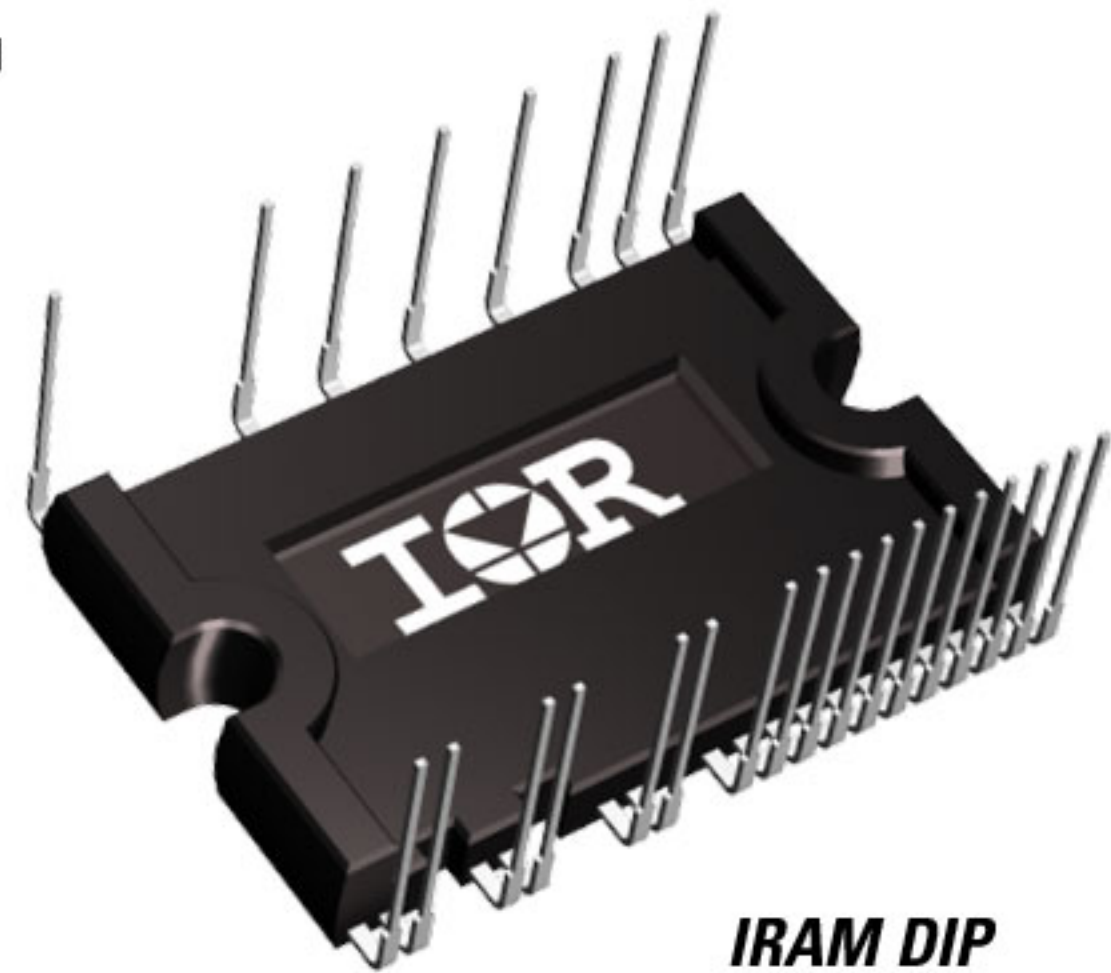


IR IRAM DIP Platform

Small footprint 38x24mm



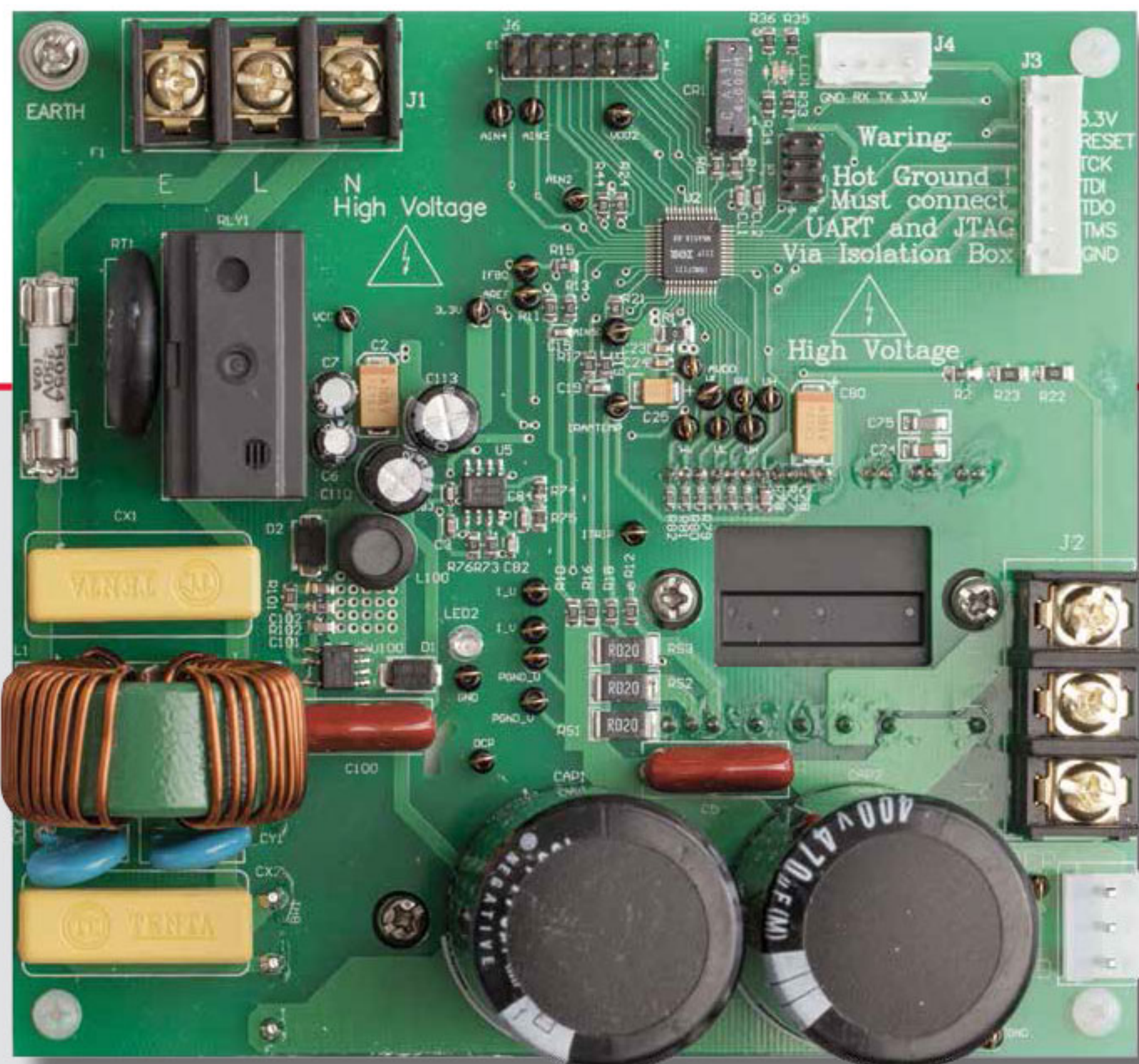
- Advanced Trench IGBTs
- Optimized Gate Drive for low EMI emission
- Rating: 450W~2000W Motor Load @ TC=100°C
- Accurate Temp Sense with UL rated Thermistor
- UL Qualified



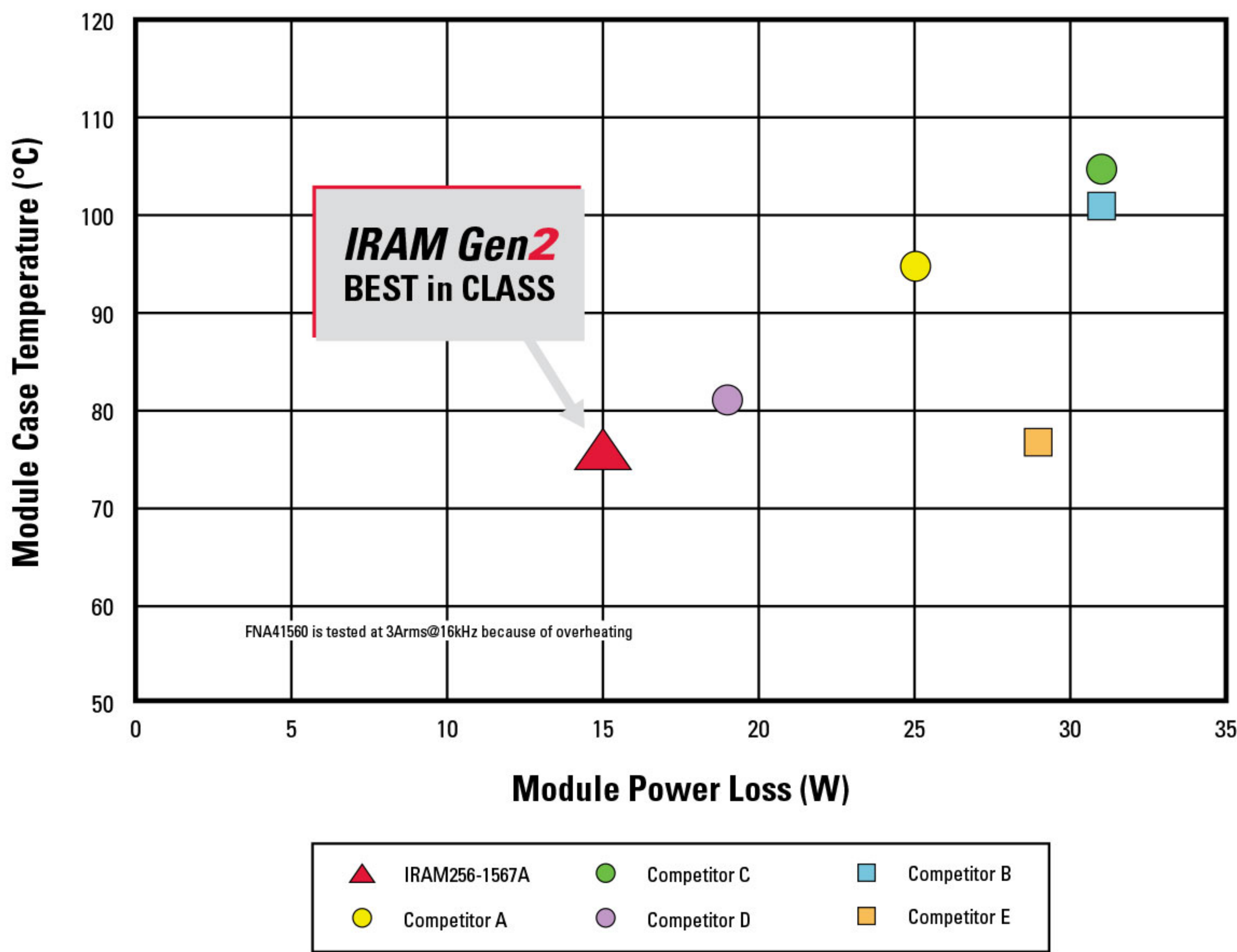
IRAM DIP

REFERENCE BOARDS FOR QUICK EVALUATION

EMI filter, on-board power supply, heatsink, complete protection, and IRMCF171 DCIC with CD-ROM starter and MCEWizard+MCEDesigner (With complete manual/documentation kits) for easy motor tuning.



Module Case Temperature $T_c=3.5A@16kHz$

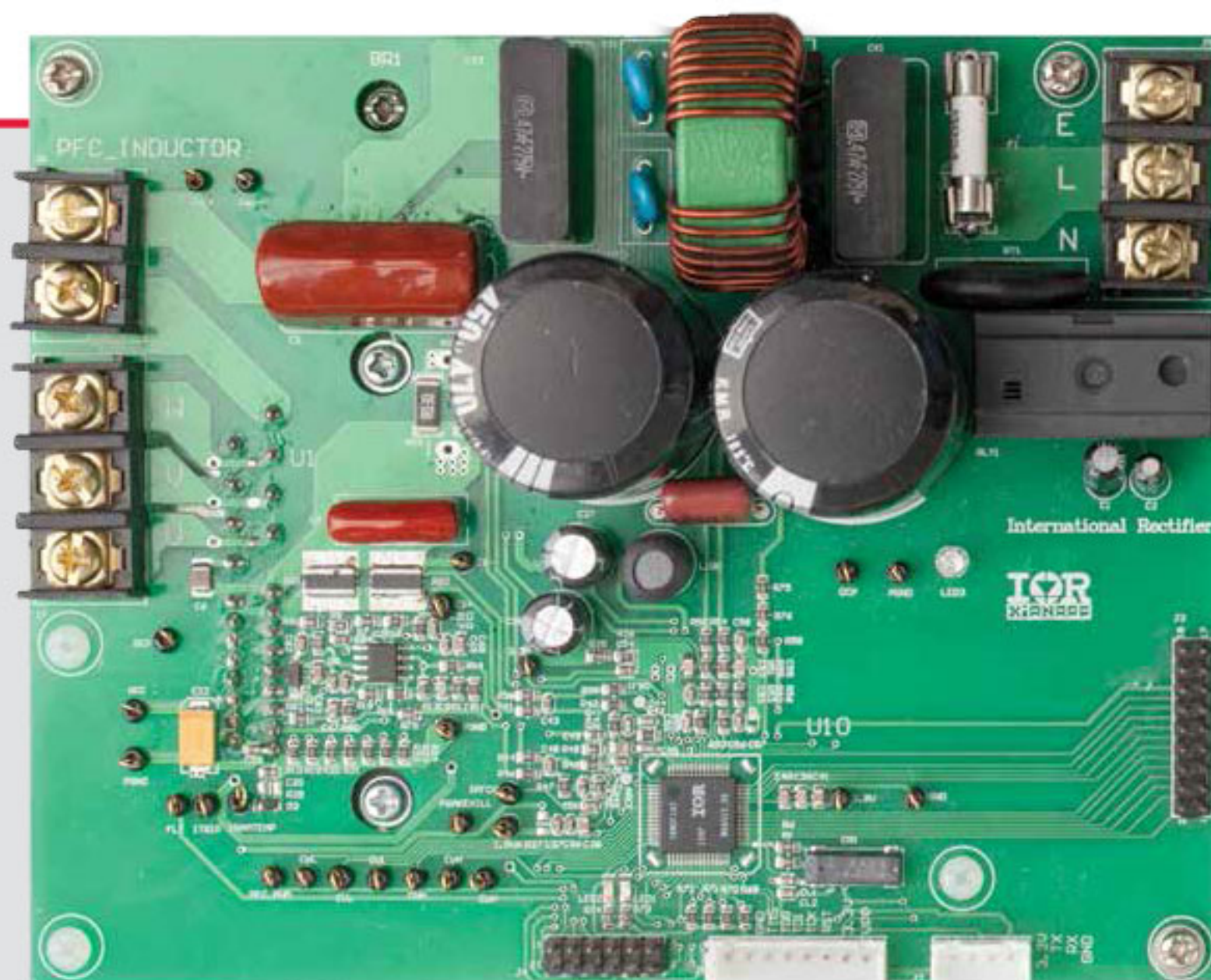
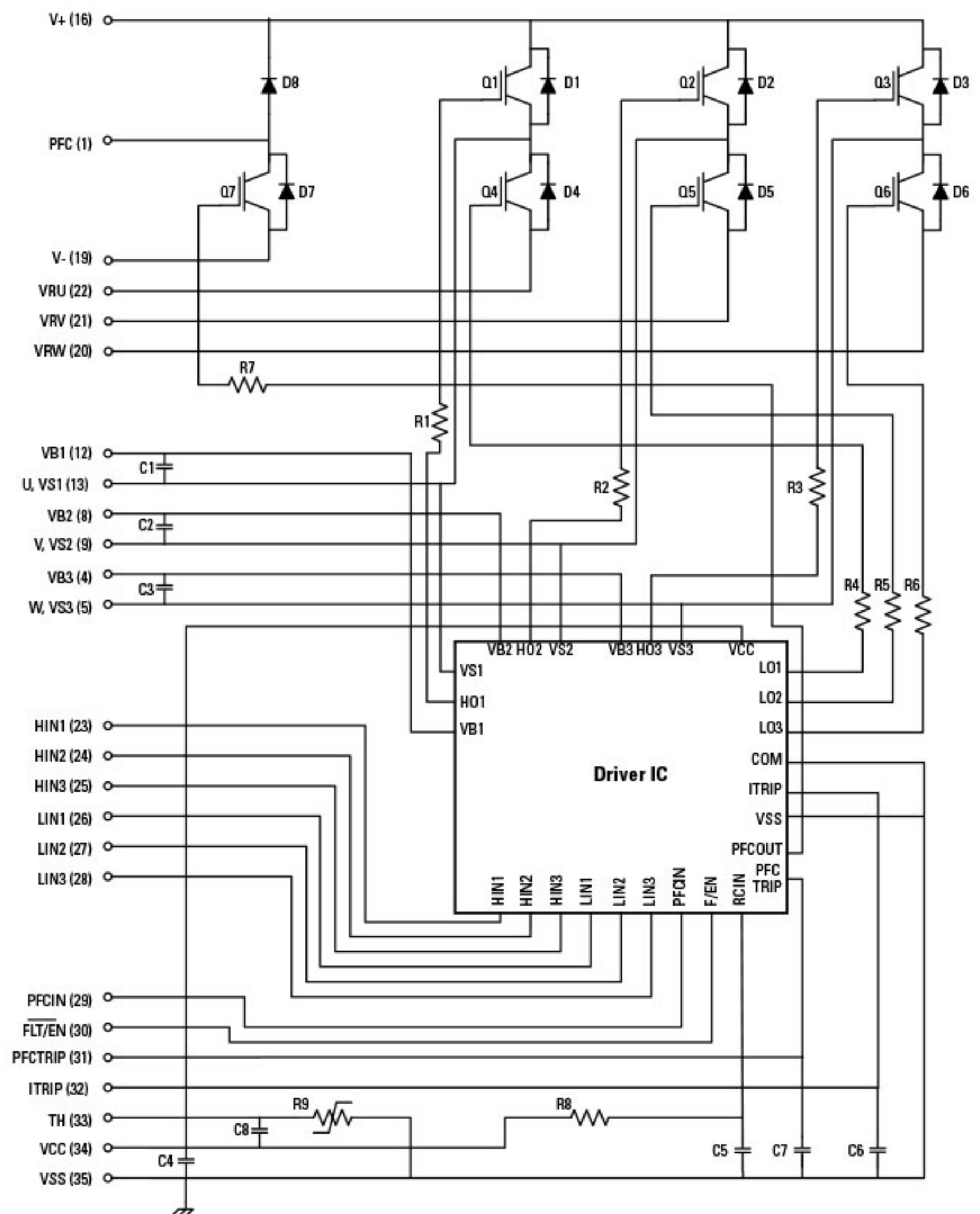
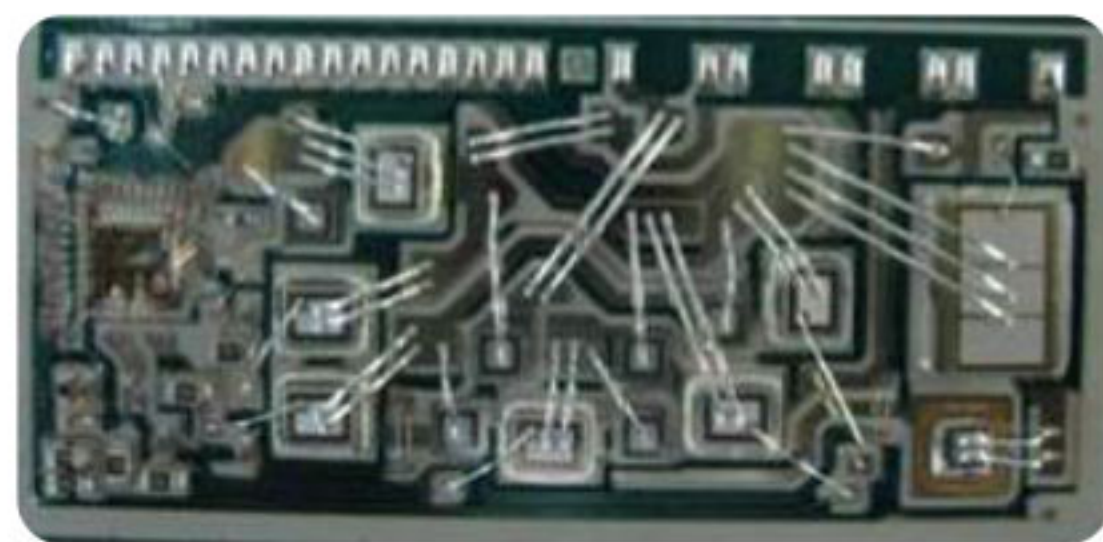


Voltage (V)	Nominal Current		Part Number	Motor Current (RMS, Tc=100°C)			Typical Motor Power @ 16 kHz		Thermal Protection Thermistor
	Io (RMS) @ Tc= 25°C (A) RMS	@ (kHz)		3P Sinus 6kHz PWM (A) RMS	3P Sinus 16kHz PWM (A) RMS	2P Sinus 16kHz PWM (A) RMS	3P Sinus PWM (W)	2P Sinus PWM (W)	
600	6	6	IRAM538-0665A	2.6	2.0	2.5	400	450	√
	8	6	IRAM538-0865A	4.0	3.0	4.0	600	700	√
	10	6	IRAM538-1065A	5.0	4.0	5.0	800	900	√
	15	6	IRAM538-1565A	7.5	5.0	6.0	1000	1150	√
	20	6	IRAM538-2065A	10.0	7.5	9.0	1450	1700	√

PFC IRAMs SIP2A+

20KHz PFC + 3Phase inverter, IRAM722-1562F

133KHz PFC + 3Phase inverter, IRAM732-1562F



FEATURES:

- PFC+Inverter for up to 1kW application
- Protection for both PFC and Inverter
- Open emitter configuration
- AC100V – 230V universal input with specified power rating
 - AC230V/11Arms 2.4kW @Tc = 100°C
 - AC115V/16Arms 1.8kW @Tc = 70°C
- High pin count SIP2A package
 - Dedicated ITRIP, FLT/EN, TEMP pin
- UL1557 high voltage isolation
- Reference design kit: IRMCS1143

Intelligent HiP Power Module Family

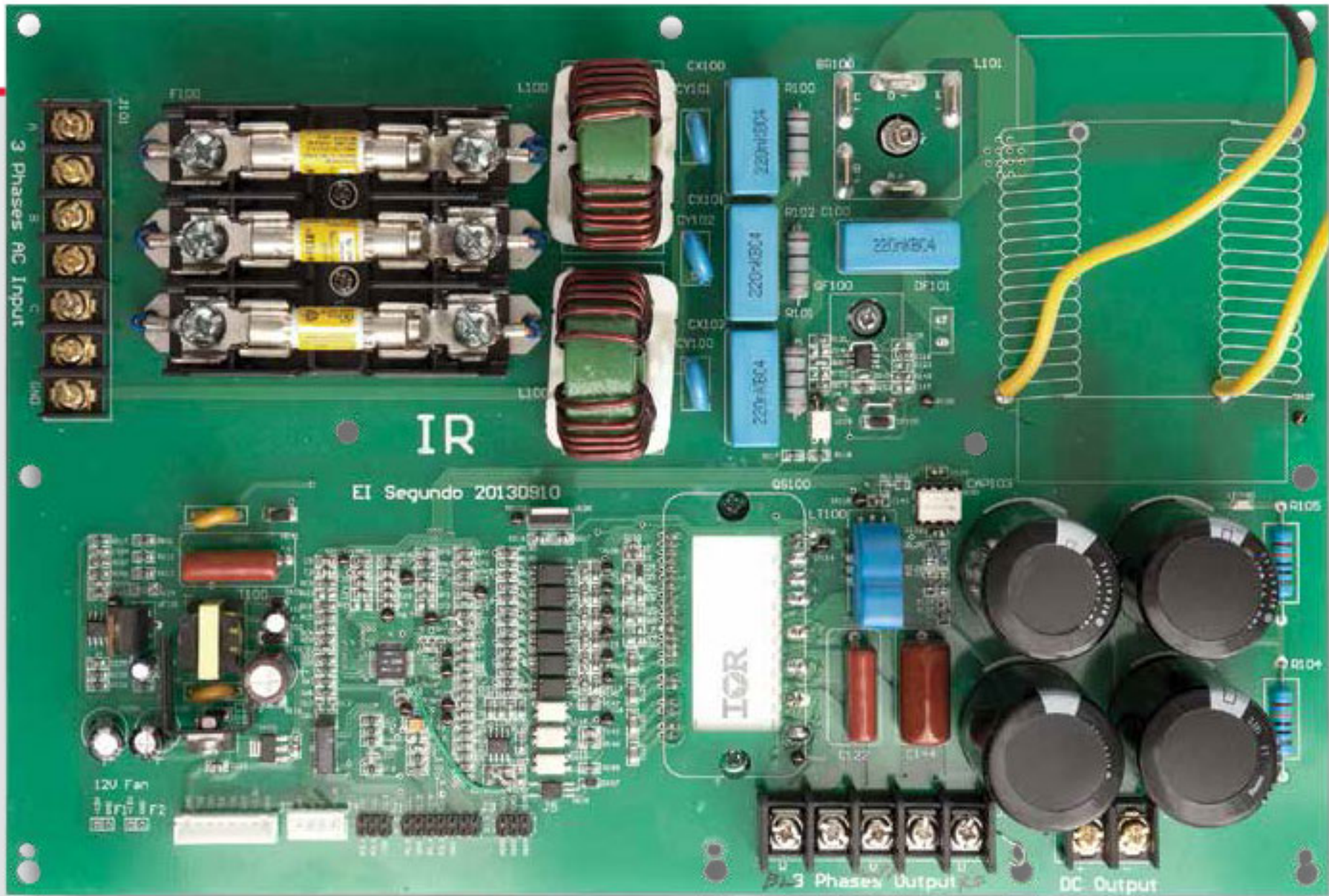
7.5kW, 600V & 1200V IPMs



IRAM HIP

- Optimized with IR HVIC and Trench IGBT chipsets
- Thermally Enhanced DBC Base
- Smallest Footprint 32 x 64mm
- 30-50A/600V and 10A-35A/1200V
- 6KHz-1200V (low loss) and 20kHz types

Part Number	Package	Voltage (V)	I_{RMS} (A)	F_{PWM} (kHz)	$T_{J,MAX}$ (°C)
IRAM437-0512A	DIP	1200	05	≤ 16	150
IRAM437-1012A	DIP	1200	10	≤ 16	150
IRAM437-1512A	DIP	1200	15	≤ 16	150
IRAM437-2012A	DIP	1200	20	≤ 16	150
IRAM437-3012A	DIP	1200	30	≤ 16	150
IRAM436-3060A	DIP	600	30	≤ 16	150
IRAM436-5060A	DIP	600	50	≤ 16	150
IRAM438-2512A	DIP	1200	25	≤ 10	150
IRAM438-3512A	DIP	1200	35	≤ 10	150



IRAM HIP
Schematics

Product Line	Applications	Key Products
 Energy Saving Products Integrated design platforms that enable customers to add energy-conserving features that achieve lower operating energy costs and manufacturing Bill of Material (BOM) costs.	• Appliances • Audio • Display • Industrial • Lighting • SMPS	• Digital Control ICs • High-Voltage ICs • IGBTs • IRAM Integrated Power Modules • MERs • μIPM™
 Enterprise Power Optimized power management system solutions that deliver benchmark power density, efficiency and performance in enterprise power.	• Servers • Storage Networks • Switchers & Routers • Workstations • Notebooks • Game Stations • Set-Top Box	• DirectFET®<i>plus</i> • SupIRBuck® • PowIRstage® • CHiL Digital Controllers
 Automotive Automotive grade power management solutions qualified to meet the needs of 12V, 24V and HEV/EV applications with a zero defect goal.	• AC and DC Motor Drives • Powertrain / Engine control • Body Electronics • Lighting • Class D Audio • Heavy Loads and Actuators	Automotive Qualified: • HEXFET® Power MOSFETs • Intelligent Power Switches • Driver ICs • IGBTs • DirectFET®2 • COOLiR™
 Benchmark MOSFETs IR continues to lead the industry by offering power MOSFETs with the lowest $R_{DS(on)}$ and widest range of packages up to 250V for a diverse range of applications.	• Audio • Computing • Communications • Motor Control • Power Supply • Synchronous Rectification	• Discrete HEXFET® MOSFETs • Dual HEXFET® MOSFETs • FETKY® • DirectFET® • StrongIRFET™ • FastIRFET™
 HiRel Our discrete components, complex hybrid power module assemblies and rugged DC-DC converters utilize leading-edge power technology which, together with demanding environmental specifications help engineers to meet their toughest design challenges.	• Space • Military • Commercial Aviation • Rugged Industrial • Medical	• RAD-Hard MOSFETs • Power Modules/Hybrid Solutions • Motor Control Solutions • DC-DC Converters