

RC-H5: Next Generation Reverse Conducting IGBT

Higher Efficiency and Better Reliability

The newest generation of reverse conducting IGBTs has been optimized for the rigorous requirements of Induction Cooking applications. The new 20A RC-H5 devices complement the previous generation of reverse conduction IGBTs and extend the performance leadership of the RC-H family, focusing on system efficiency and reliability.

RC-H5 offers up to 30% reduction in switching losses, allowing designers to use higher frequencies. With this increased switching frequency comes the flexibility of higher efficiency or system cost reductions from smaller coil choices.

Improvements in thermal performance and reduced power dissipation, even under higher ambient temperatures and stress conditions, result in better reliability. Soft switching capabilities result in better EMI behavior leading to less filtering requirements and lower system costs.

The RC-H5 family is offered in two versions with blocking voltages of 1200V and 1350V.

Key Features

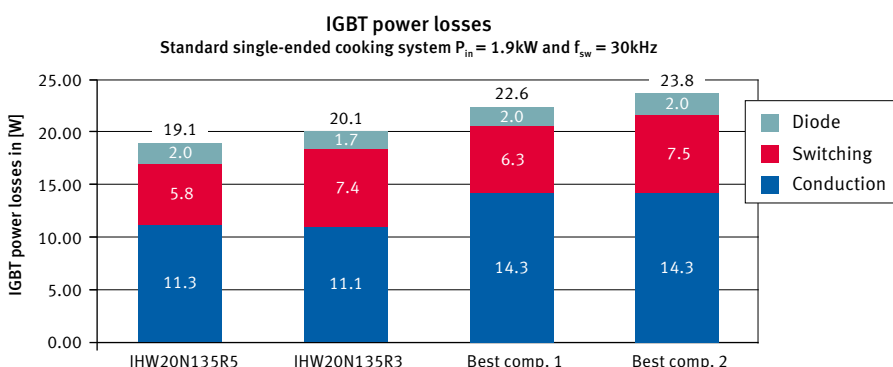
- Switching losses reduced by 30%
- Very low conduction losses
- Reduced turn-on current spike up to 10%
- $T_{j(max)} = 175^{\circ}C$
- Soft current turn-off waveforms for low EMI
- Higher blocking voltage
 $V_{BR(min)} = 1350V$

Key Benefits

- Increased switching frequency
- Lowest power dissipation
- Better thermal management for higher reliability
- Lower EMI filtering requirements
- Reduced system costs
- Highest reliability against peak currents

Applications

- Induction cooking stoves
- Inverterized microwave ovens
- Induction rice cookers
- Induction water heaters
- Other resonant switching topologies



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The RC-H5 devices offer significant reductions in switching losses, up to 30%. These lower losses allow systems to operate at

higher switching frequencies. An increase in frequency allows designers to optimize for their unique system needs.

System Example

- Switching frequency increase from 23kHz to 30kHz, with same power losses in the device
- RC-H5 offers these flexible design possibilities:

Options for Design Optimizations		
System efficiency	System cost reduction	Lower cooling effort
Improvement up to 0.5% (>90% total system)	Smaller inductance and coil/copper amount saves up to 10% in coil costs	For a 1.9kW system, T_{case} can be reduced by 2°C, and under high ambient temperatures up to 12°C, resulting in less thermal stress and better reliability.

RC-H5 Product Family

		IHW20N120R5	IHW20N135R5
Schedule		Coming soon!*	Available now!
Package		TO-247	TO-247
V_{br} (V)		1200	1350
I_c (A)	T_{case} (25°C)	40	40
	T_{case} (100°C)	20	20
$V_{CE(sat)}$ (V)	T_j (25°C)	1.55	1.65
	T_j (175°C)	1.85	1.95
V_f typ (V)	T_j (175°C)	1.85	1.95
E_{off} (mJ) @ 600V, 100V/μs	T_j (25°C)	0.075	0.10

* Preliminary

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