

英飞凌IGBT单管 及 二极管 产品介绍

英飞凌科技（中国）有限公司
2021年4月

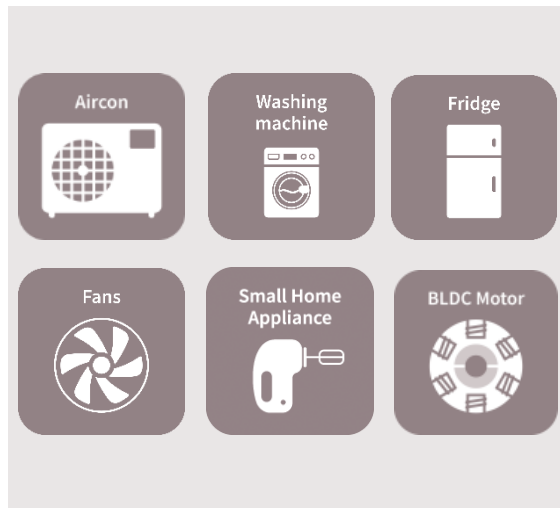


英飞凌单管IGBT：主要应用

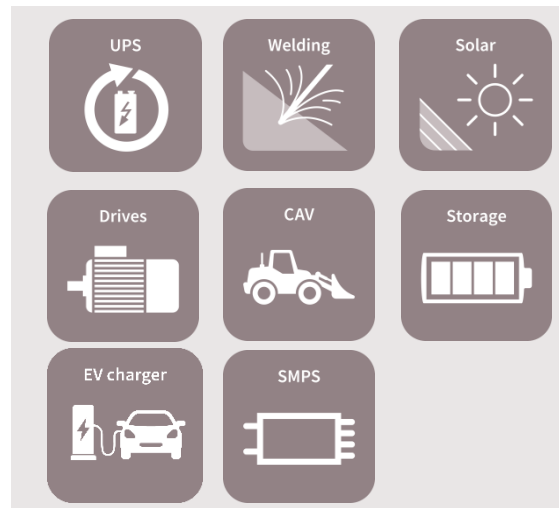
感应加热



变频家电



工业应用



英飞凌单管IGBT：总览 2-1

封装	TO-252 DPAK	TO-263 D ² PAK	TO-220 (FP)	TO-247 AI	TO-247 3pin/4pin	TO-247PLUS 3pin/4pin	TO-247 6pin
电压等级	600V		650V	1100V	1200V	1350V	1600V
配置	带反并联二极管的IGBT				不带反并联二极管的IGBT		
电流等级	2A - 120A						

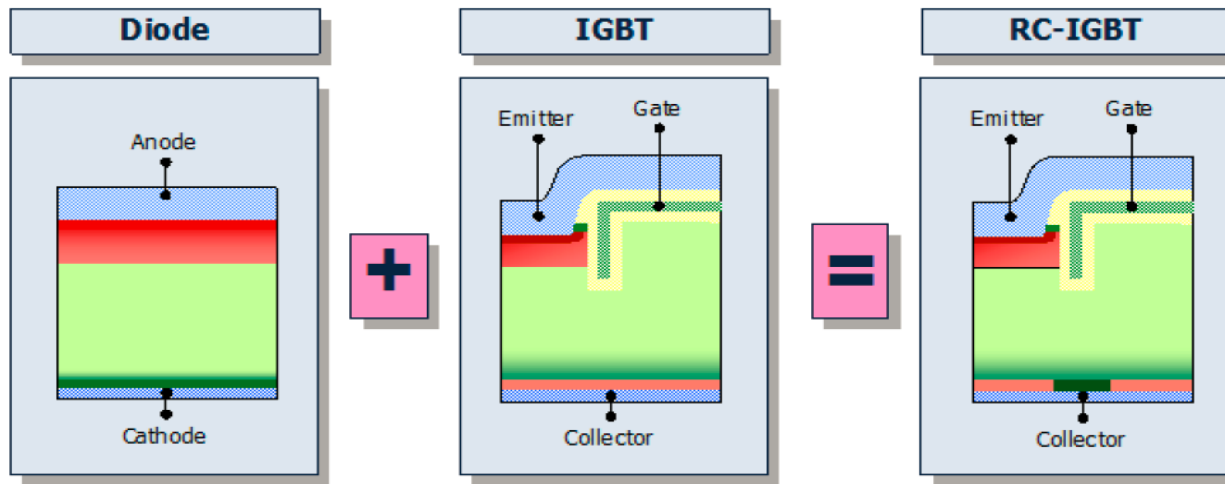
英飞凌单管IGBT：总览 2-2

< 1 k voltage rating			> 1 k voltage rating		
	650 V CoolSiC™ hybrid discrete	40 – 100 kHz			
	650 V TRENCHSTOP™ 5	10 – 100 kHz			
5 μs	600 V HighSpeed3 H3	40 kHz	1200 V HighSpeed 3 H3	10 μs	Hard switching
5 μs	650 V TRENCHSTOP™ IGBT7 T7				
3 μs	650 V TRENCHSTOP™ IGBT6	30 kHz	1200 V TRENCHSTOP™ IGBT6	3 μs	
5 μs	600 V TRENCHSTOP™ Performance				
3 μs	600 V RC-D2		1200 V TRENCHSTOP™ 2	10 μs	
5 μs	600 V TRENCHSTOP™	20 kHz			
5 μs	600 V RC-DF				
5 μs	600 V RC-D	15 kHz	1200 V TRENCHSTOP™	10 μs	
	650 V Reverse Conducting R6	75 kHz			
	650 V Reverse Conducting R5	60 kHz	1200/1350/1600 V Reverse Conducting R5		
		40 kHz	1200 V Reverse Conducting E1		

kHz f_{sw} [kHz] (typical used up to)
 μs Short circuit withstand time [μs]

英飞凌单管IGBT：RC逆导型

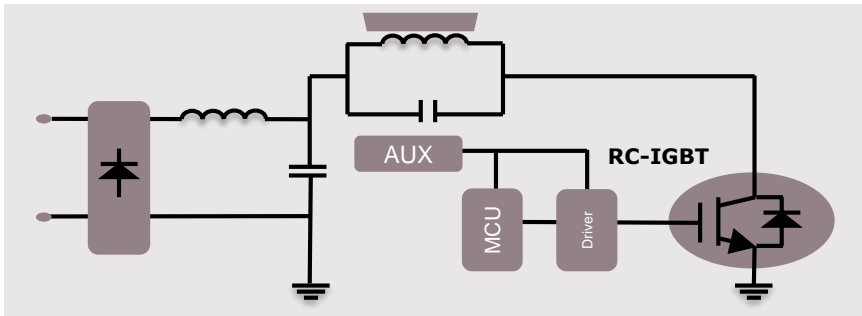
› IGBT和反并联二极管共用一块晶圆



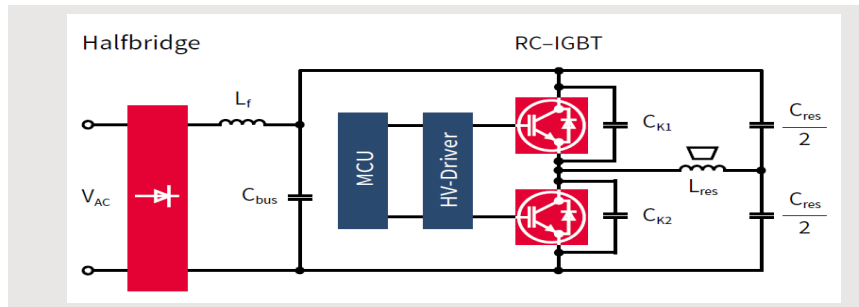
- “RC”：
 - 感应加热 软开关 IHxxxR2/R3/R5/R6/E1 系列
 - PFC IKWxxWR5 系列
- “RC-D/DF”：电机驱动 硬开关 5us短路时间 IKDxxN60R/RF 系列

感应加热的电路原理图

单端拓扑



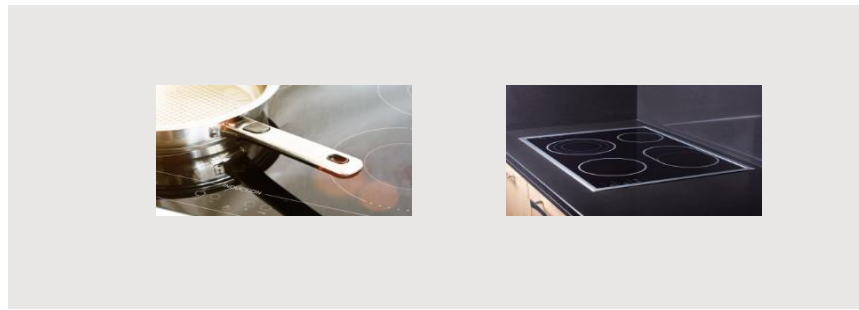
半桥拓扑



典型应用



典型应用



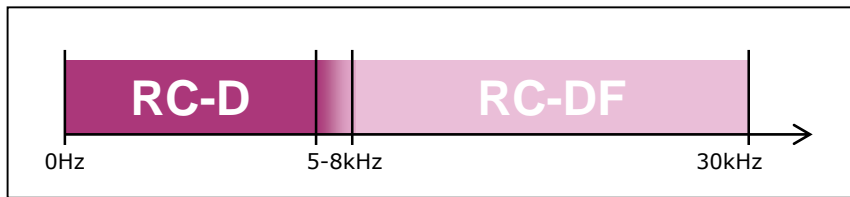
英飞凌单管IGBT: Protected/R5/R6/E1 (针对于感应加热)

I _c nom [A]	Features	Price	Performance				Protection	
	Topology	Single ended	Half bridge		Single ended		Single ended	
	Family	E1	R5	R6	R5	R5	R5	Protected IGBT
	Voltage	1200V	650V		1200V	1350V	1600V	1350V
15		IHW15N120E1						
20			IHW20N65R5		IHW20N120R5	IHW20N135R5		IIEWS20R5135IPB
25		IHW25N120E1						
30			IHW30N65R5	IHW30N65R6	IHW30N120R5	IHW30N135R5	IHW30N160R5 (*)	
40			IHW40N65R5	IHW40N65R6	IHW40N120R5	IHW40N135R5		
50			IHW50N65R5	IHW50N65R6				
Package		TO247-3	TO247-3	TO247-3	TO247-3	TO247-3	TO247-3	TO247-6
Recommended Driver IC		IRS44273L	2ED218x	2ED218x	IRS44273L	IRS44273L	IRS44273L	Co-packed driver with protection functions

Protected: 全保护功能 R5/R6: 高性能 E1: 高性价比

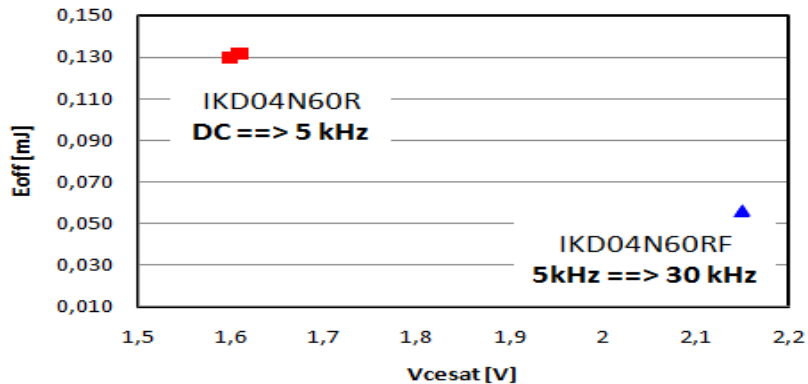
英飞凌单管IGBT：RC-D/DF产品系列 (针对于电机驱动 600V DPAK)

产品推荐

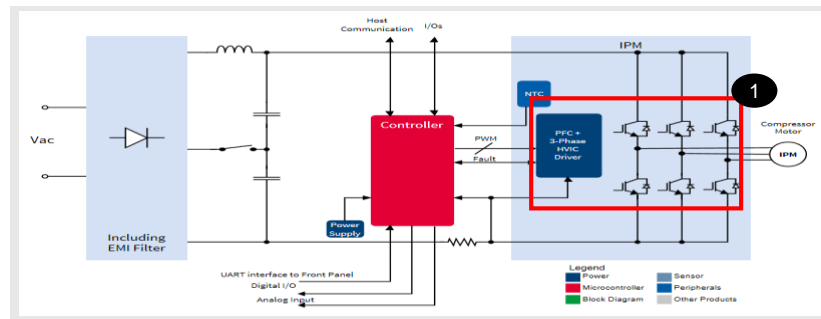


E_{eff} vs V_{cesat}

R_g=40 Ohm I_c=4A T=175°C



全桥拓扑



	RC-D	RC-DF
3A		✓
4A	✓	✓
6A	✓	✓
10A	✓	✓
15A	✓	✓

针对于电机驱动的新产品规划

TRENCHSTOP™ IGBT6 and RCD2 are the successor of TRENCHSTOP™ and RCDF product lines.

IGBTs with Anti-Parallel Diode – suggested for drives up to 1KW

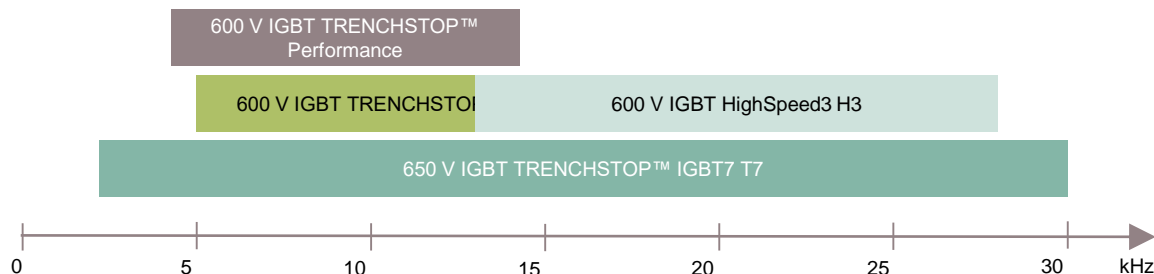
Ic 100°C	SOT-223	DPAK			D ² PAK	TO-220	TO-220FP	
	RC-D2	RC-DF	RC-D2	TRENCHSTOP™ IGBT 6	TRENCHSTOP™	TRENCHSTOP™	TRENCHSTOP™	TRENCHSTOP™ IGBT 6
3	IKN03N60RC2	IKD03N60RF						
4	IKN04N60RC2	IKD04N60RF	IKD04N60RC2			IKP04N60T		
6	IKN06N60RC2	IKD06N60RF	IKD06N60RC2	IKD06N65ET6	IKB06N60T	IKP06N60T		
8	21Q2			IKD08N65ET6				IKA08N65ET6
10		IKD10N60RF	IKD10N60RC2		IKB10N60T	IKP10N60T	IKA10N60T	IKA10N65ET6
15		IKD15N60RF	IKD15N60RC2		IKB15N60T	IKP15N60T	IKA15N60T	IKA15N65ET6
20						IKP20N60T		
Single IGBT								
6						IGP06N60T		
10				IGD10N65T6	IGB10N60T	IGP10N60T		
15				IGD15N65T6	IGB15N60T	IGP15N60T		

Recommended Drivers:

Half-bridge:
2ED2304S06F,
IRS2890DS

Half-bridge: 2EDL23I06PJ, 2EDL05I06PF, IRS2183S
High and low-side: IRS2113S
Three-phase: 6EDL04I06PT, IRS2334S, 6ED003L06-F2

英飞凌单管IGBT: 650 V TRENCHSTOP™ IGBT7 T7

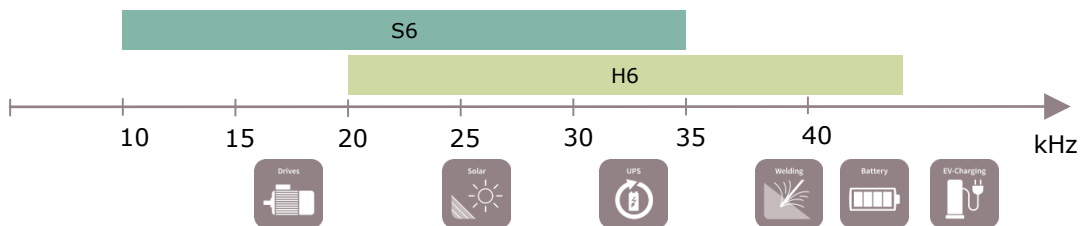


Nominal current 100°C	650 V IGBT TRENCHSTOP™ IGBT7 T7	600 V IGBT TRENCHSTOP™	600 V IGBT TRENCHSTOP™ Performance	600 V IGBT HighSpeed3 H3
20 A Co-packed	IKW20N65ET7	IKW20N60T		IKW20N60H3
30 A Co-packed	IKW30N65ET7	IKW30N60T	IKW30N60DTP	IKW30N60H3
40 A Co-packed	IKW40N65ET7		IKW40N60DTP	IKW40N60H3
50 A Co-packed	IKW50N65ET7	IKW50N60T	IKW50N60DTP	IKW50N60H3
75 A Co-packed	IKW75N65ET7	IKW75N60T		IKW75N60H3

Application measurements confirm the superiority of TRENCHSTOP™ IGBT7 T7 with 20% lower case temperature versus previous TRENCHSTOP™ generations and competition

英飞凌单管IGBT: 1200V TRENCHSTOP™ IGBT4 T2/H3和IGBT6 H6/S6

	TO-247-3				TO-247PLUS-3			TO-247PLUS-4	
Icnom @ 100°C	T2	H3	H6	S6	T2	H3	S6	H3	S6
15	IKW15N120T2	IKW15N120H3	IKW15N120BH6						
25	IKW25N120T2	IKW25N120H3							
40	IKW40N120T2	IKW40N120H3		IKW40N120CS6	IKQ40N120CT2	IKQ40N120CH3		IKY40N120CH3	IKY40N120CS6
50					IKQ50N120CT2	IKQ50N120CH3		IKY50N120CH3	
75					IKQ75N120CT2	IKQ75N120CH3	IKQ75N120CS6	IKY75N120CH3	IKY75N120CS6





Part of your life. Part of tomorrow.