

Sales Tool

650V Silicon Carbide Diodes in DFN8x8 package

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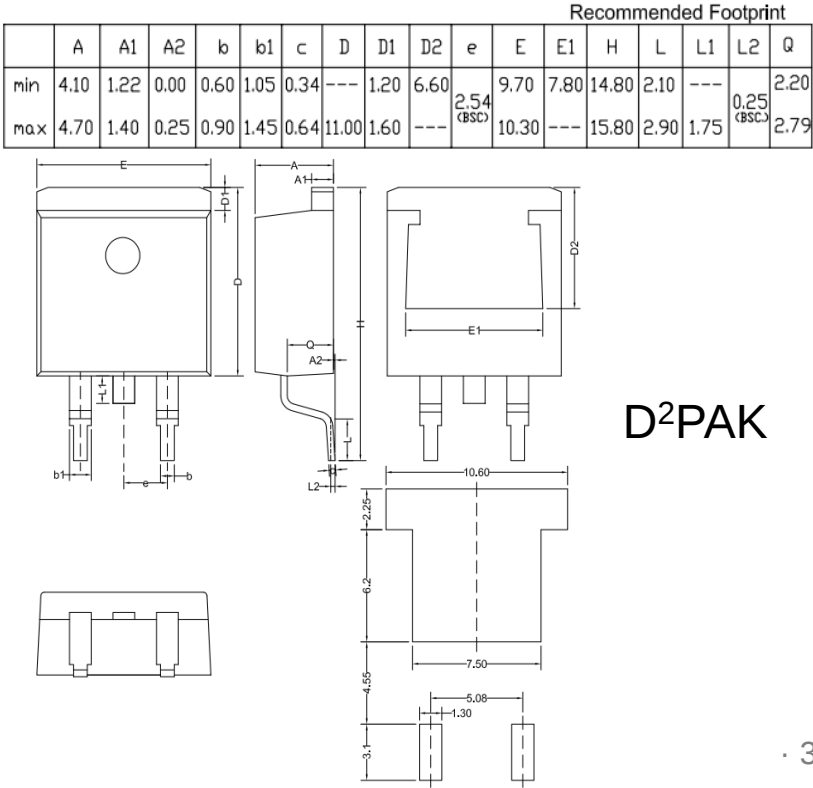
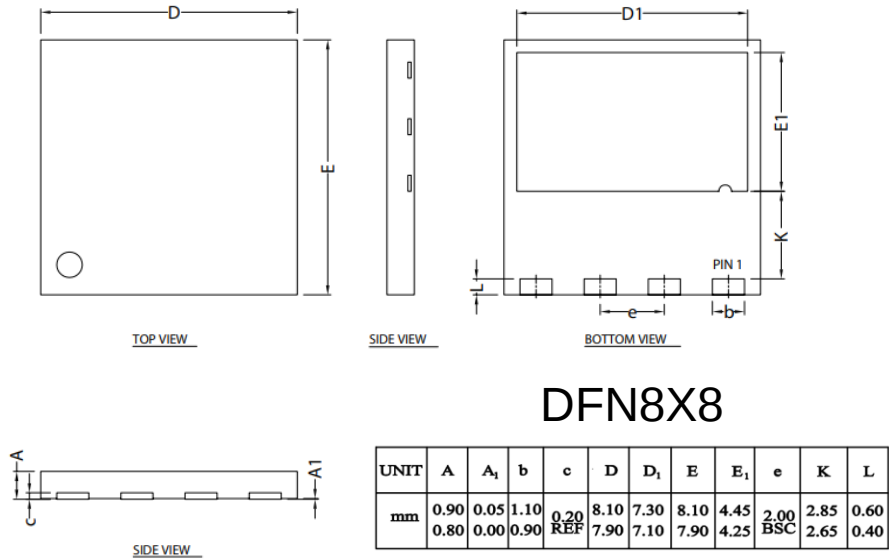
DFN8x8 package



Package outline	D ² PAK	DFN8X8	DFN8X8 vs D ² PAK
			
L x W x H (mm ³)	10 x 11 x 4.4	8 x 8 x 0.85	
Footprint (mm ²)	110	64	-42%
Volume (mm ³)	484	54.4	-88%

Features of DFN8X8

- Surface Mount Package
- Package: height <1mm with light weight
- Low parasitic inductance due to “No-pin” design
- Thermal path through the metal pad to the PCB improves thermal performance

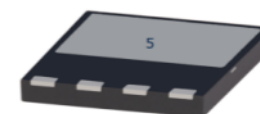


Part No	V_{DC} (V)	I_F (A)	V_F (V)* ¹	I_{FSM} (A)* ²	Cd (pF)* ³	I_R (μA)
WNSC04650T	650	4	1.56	36	16.4	0.75
WNSC06650T	650	6	1.50	54	24	1.41
WNSC08650T	650	8	1.55	72	32	1.71
WNSC10650T	650	10	1.58	76	35	1.24

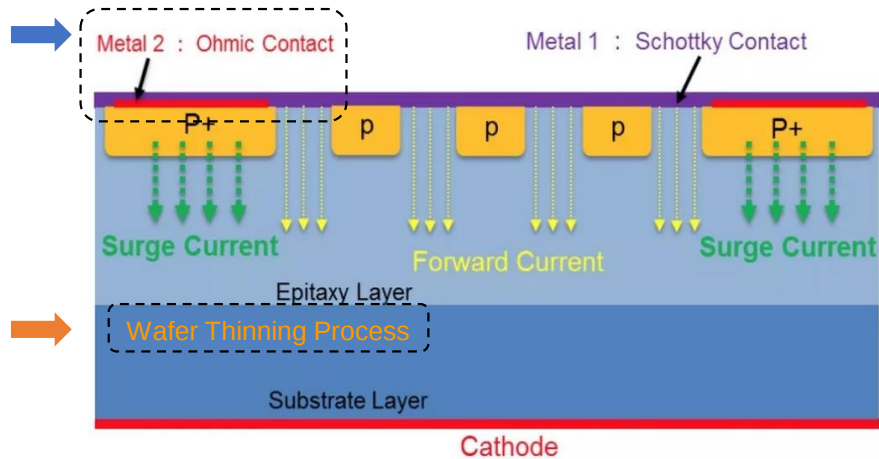
*1: measured at rated current, $T_C = 25^\circ\text{C}$

*2: $T_C = 25^\circ\text{C}$, $t_p = 10\text{ ms}$

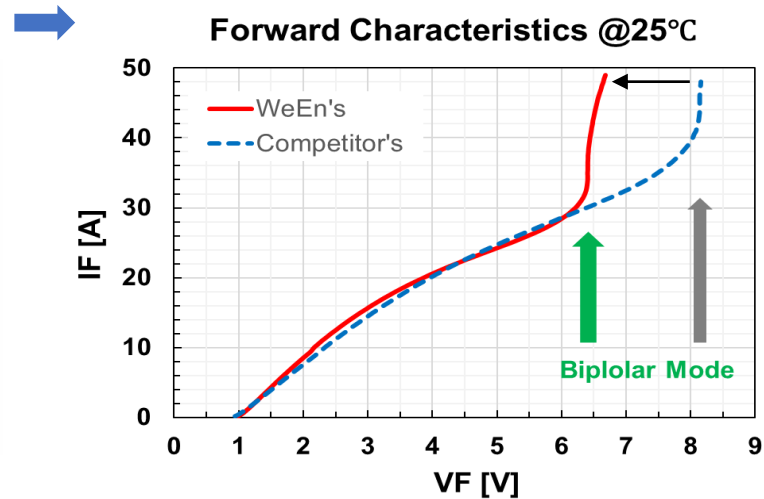
*3: $f = 1\text{ MHz}$, $V_R = 300\text{ V}$, $T_C = 25^\circ\text{C}$



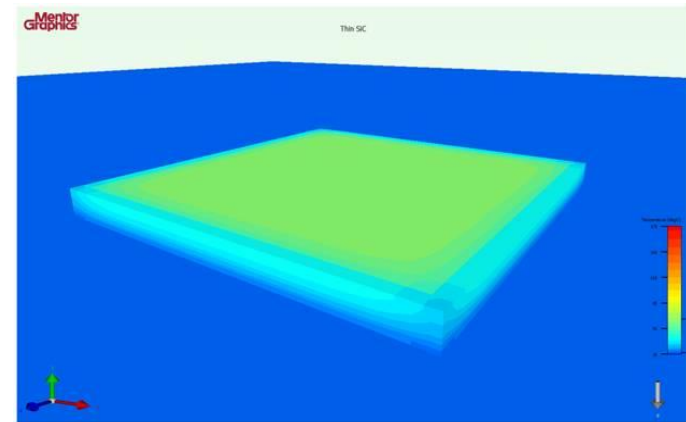
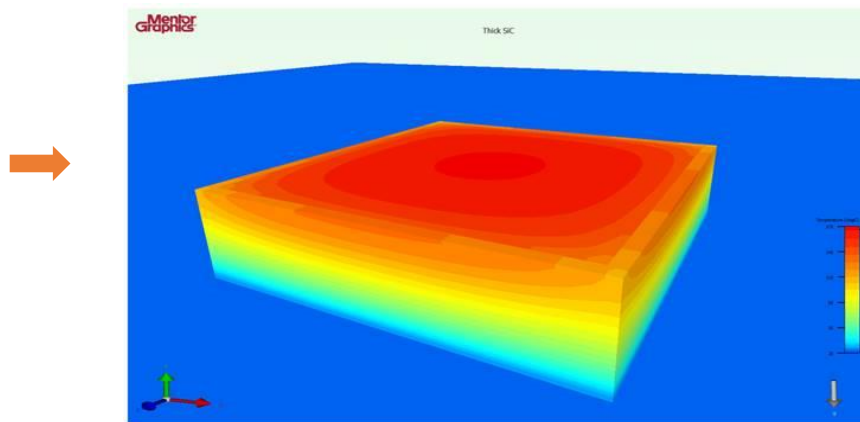
WeEn Gen.5 SiC diodes – Merged PN Schottky (MPS)



Merged PN Schottky (MPS) structure with thinner Substrate



Ohmic Contact exists between Metal 2 and P+ doping layers



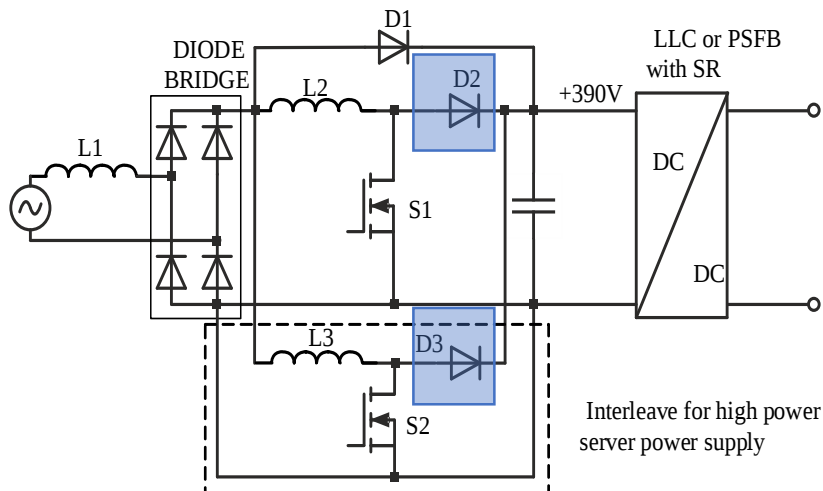
Wafer Thinning Process allows the thickness of the substrate of WeEn SiC diodes to be reduced to **1/3 of the competitor average thickness**. This gives better thermal conduction to the lead-frame. The customer benefit is a lower temperature and thus enhanced reliability

Applications

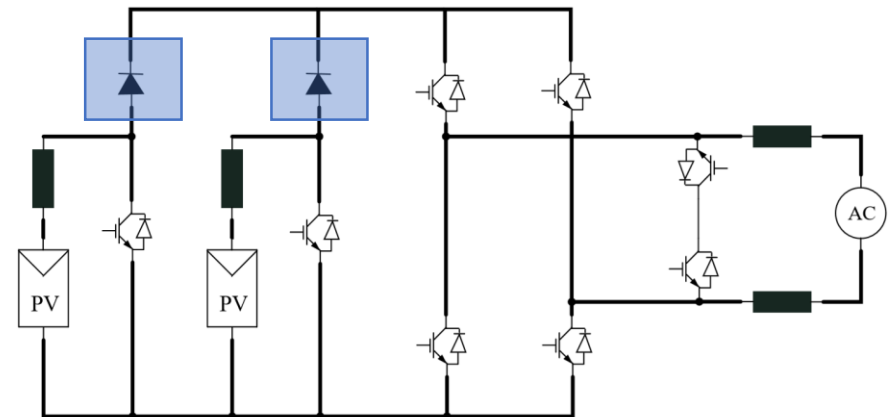
- Telecom / Server power supply
- Photovoltaic / Solar inverter

Benefit in applications

- High power density with DFN8X8
- Excellent high frequency switching performance with reduced parasitic inductance compared with through-hole and conventional SMD packages



Telecom / Server power supply



Photovoltaic / Solar inverter

WeEn 650V/10A SiC Diodes (DFN8X8)

Performance benchmark (1/4)



Static parameters

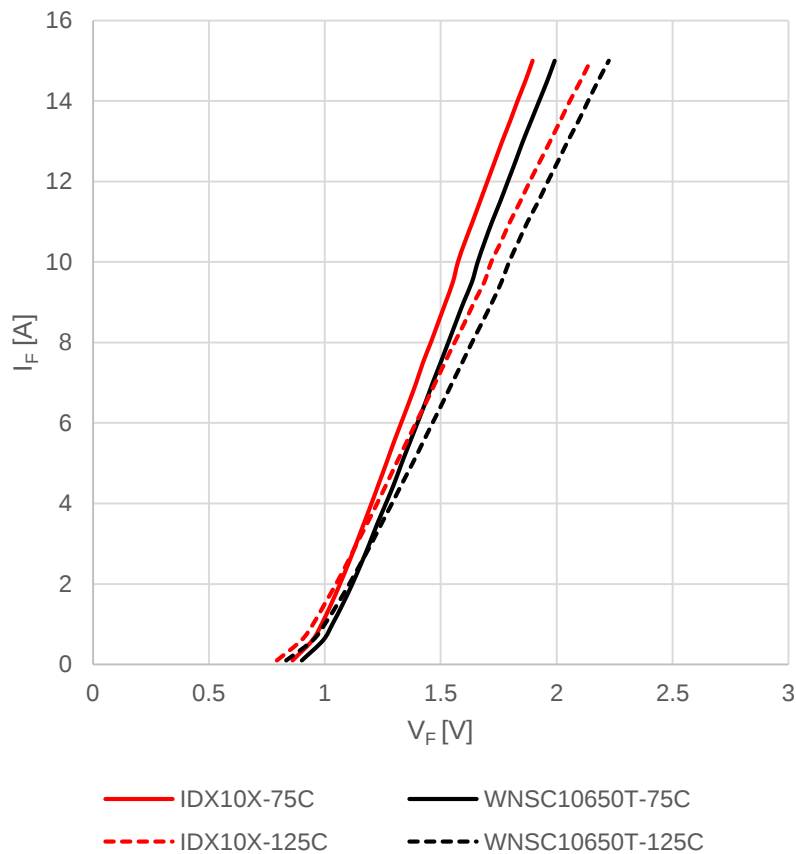
	WN5C10650T	IDX10X	Condition
$V_{F(max)}$	<1.7 V	<1.7 V	@ $I_F = 10A$, $T_C = 25^{\circ}C$
V_R	816 V	798 V	@ $I_R = 2mA$, $T_C = 125^{\circ}C$
I_R	3.94 μA	5.22 μA	@ $V_R = 650V$, $T_C = 125^{\circ}C$
C_D	35.0 pF	38.6 pF	@ $f = 1\text{ MHz}$, $V_R = 300\text{ V}$, $T_C = 25^{\circ}C$
I_{FSM}	76 A	83 A	@ 10 ms, sinusoidal waveform
I_{FSM}	> 750A	>750 A	@ 10 μs , square waveform

WeEn 650V/10A SiC Diodes (DFN8X8)

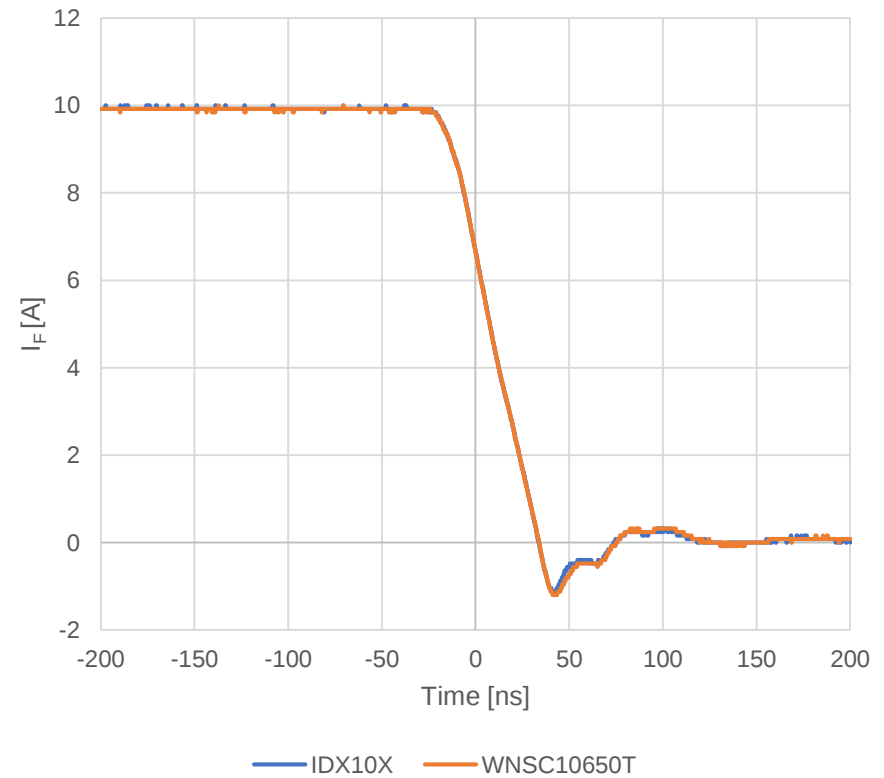
Performance benchmark (2/4)



IF – VF curve



Reverse recovery current @ 25°C

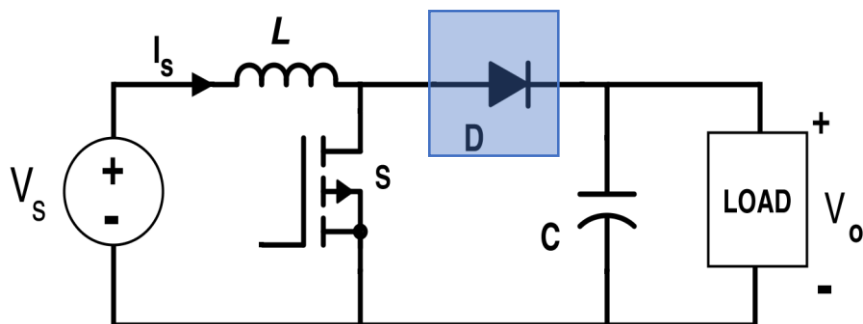


WeEn 650V/10A SiC Diodes (DFN8X8)

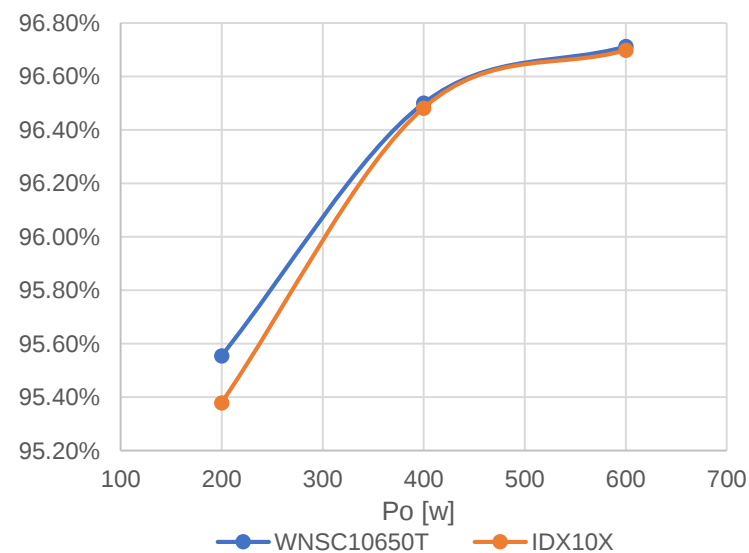
Performance benchmark (3/4)



650V / 10A SiC diode in Boost PFC



PFC in CCM mode:
efficiency comparison @ $V_i = 220\text{ V}$, $V_o = 403\text{ V}$, $f = 74\text{ kHz}$

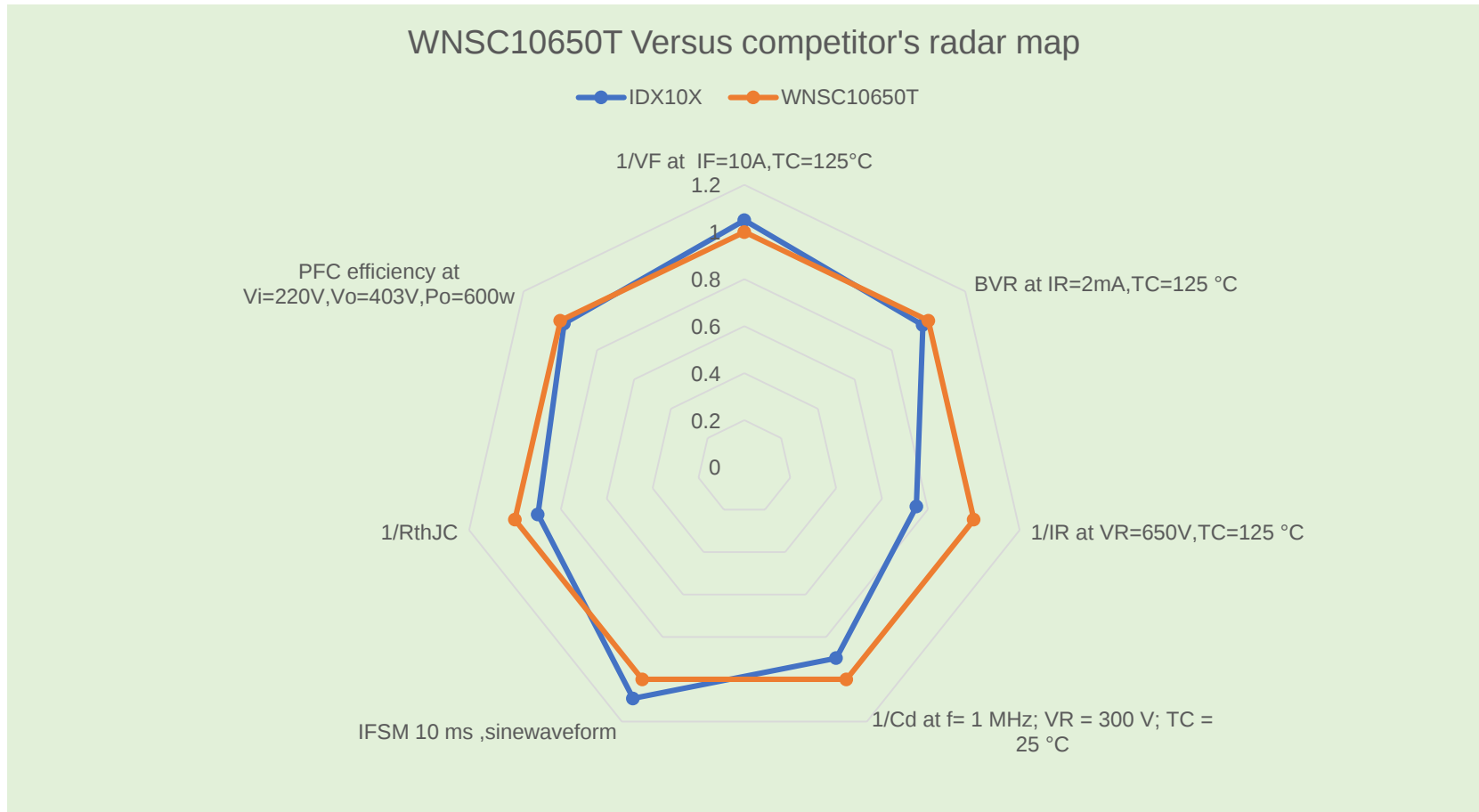


WeEn 650V/10A SiC Diodes (DFN8X8)

Performance benchmark (4/4)



Radar chart of performance evaluation between WNSC10650T vs Competitor





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