



## Product brief

# 1200 V TRENCHSTOP™ IGBT6

New 1200 V IGBT generation for the best efficiency in fast switching designs

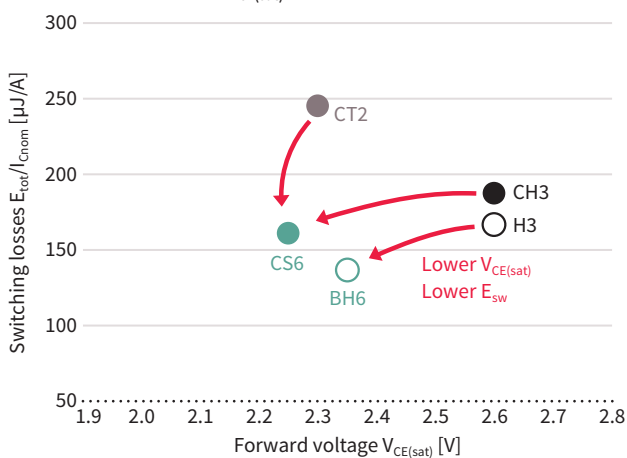
The new 1200 V IGBT generation TRENCHSTOP™ IGBT6 is designed to meet requirements of high efficiency, lowest conduction and switching losses in hard switching and resonant topologies operating at switching frequencies above 15 kHz.

The TRENCHSTOP™ IGBT 6 is released in 2 product families – low conduction losses optimized S6 series and improved switching losses H6 series. The TRENCHSTOP™ IGBT6 S6 series features low conduction losses of 1.85 V collector-emitter saturation voltage  $V_{CE(sat)}$  combined with low switching losses of the HighSpeed 3 H3 series. TRENCHSTOP™ IGBT6 H6 series is optimized for low switching losses, provides ~15 percent lower total switching losses when compared to predecessor generation H3.

Very soft, fast recovery anti-parallel emitter controlled diode is optimized for fast recovery while still maintaining a high level of softness complementing to an excellent EMI behavior.

Positive temperature coefficient allows easy and reliable device paralleling. Very good  $R_G$  controllability allows adjustment of IGBT switching speed to the requirements of application.

### IGBT6 features lower $V_{CE(sat)}$ and lower switching losses<sup>1)</sup>



1) Based on datasheet values at  $T_{vj} = 175^\circ C$

### TRENCHSTOP™ IGBT6

=  
Conduction losses of  
TRENCHSTOP™ 2  
  
+  
Lower switching losses  
than HighSpeed 3

### Key features

#### Features

- > Low conduction losses with 1.85 V  $V_{CE(sat)}$  for S6 series
- > Best combination of switching and conduction losses for switching frequency 15–40 kHz
- > High  $R_G$  controllability
- > Low EM
- > Full rated, robust freewheeling diode

#### Benefits

- > Easy, plug and play replacement of predecessor HighSpeed 3 H3 IGBT
- > 0.15 percent system efficiency improvement when changing from H3 to S6 in TO-247-3<sup>2)</sup>
- > 0.2 percent system efficiency improvement when changing from H3 to S6 in TO-247PLUS 4pin<sup>2)</sup>

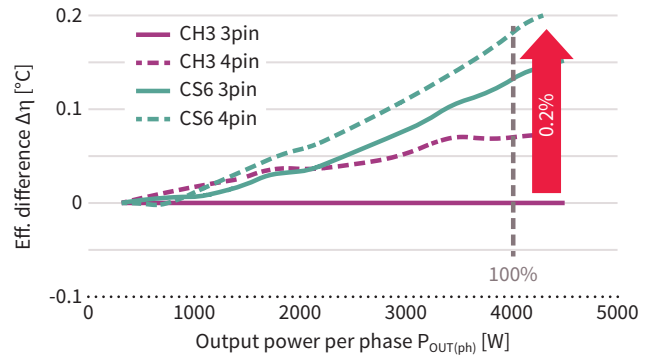
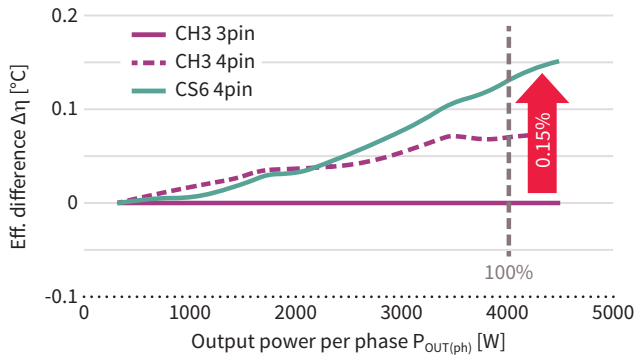
2) Defined by application test in 3-phase T-type converter



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Application test at 3-level T-type inverter at 16 kHz<sup>3)</sup>



3) Test conditions: V<sub>CE</sub> = 15/-5 V, R<sub>CE</sub> = 5 Ω, V<sub>bus</sub> = 750 V, I<sub>out</sub> = 1.5–19.5 A (steps of 1.5 A every 5 minutes), cos(φ) = 1, f<sub>sw</sub> = 16 kHz

The TRENCHSTOP™ IGBT6 is designed to be an easy direct replacement to the predecessor HighSpeed 3 IGBT series. Internal test at 3-phase T-type converter showed that plug and play replacement of H3 IGBT with new IGBT6 S6 in TO-247-3 package brings efficiency improvement of 0.15 percent. When replacing H3 in TO-247-3 with S6 device in TO-247PLUS 4pin package the efficiency can be improved by 0.20 percent.

Product portfolio of the new 1200 V TRENCHSTOP™ IGBT offers unique, the highest current 75 A 1200 V discrete IGBT copacked with 75 A diode in TO-247PLUS 3pin and low switching losses Kelvin Emitter TO-247PLUS 4pin package.

## Product portfolio 1200 V TRENCHSTOP™ IGBT6

Product part number	V <sub>CE</sub> at 25°C [V]	I <sub>C</sub> at 100°C [A]	I <sub>F</sub> at 100°C [A]	V <sub>CE(sat)</sub> at 25°C [V]	E <sub>on</sub> at 25°C [mJ]	E <sub>off</sub> at 25°C [mJ]
				V <sub>GE</sub> = 15.0 V, I <sub>C</sub> = 40.0 A	T <sub>VJ</sub> = 25°C, V <sub>CC</sub> = 600 V, I <sub>C</sub> = 75.0 A, V <sub>GE</sub> = 0.0/15.0 V, R <sub>G(on)</sub> = 4.0 W, R <sub>G(off)</sub> = 4.0 W, L <sub>S</sub> = 70 nH, C <sub>S</sub> = 67 pF	
Package: TO-247-3						
IKW15N120BH6	1200	15	15	1.90	0.70	0.55
IKW40N120CS6	1200	40	40	1.85	2.55	1.55
Package: TO-247PLUS 3pin						
IKQ75N120CS6	1200	75	75	1.85	5.15	2.95
Package: TO-247PLUS 4pin						
IKY40N120CS6	1200	40	40	1.85	1.45	1.55
IKY75N120CS6	1200	75	75	1.85	2.20	2.95

[www.infineon.com/igbt6-1200v](http://www.infineon.com/igbt6-1200v)

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