Product Brief

TRENCHSTOP™ 5 L5

The New Efficiency Benchmark for Polarity Switches at 50Hz

Infineon's L5 low saturation voltage $V_{CE(sat)}$ TRENCHSTOP™ 5 IGBT family has been specifically optimized for polarity switches operating at switching frequencies from 50Hz-20kHz. The intrinsically low conduction losses of the 55µm TRENCHSTOP™ 5 thin wafer technology have been reduced further with additional optimization of the carrier profile.

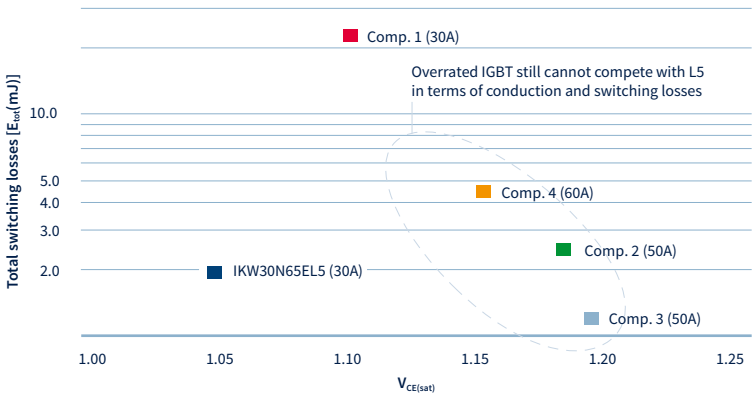
Lowest $V_{CE(sat)}$ value of 1.05V

With a typical $V_{CE(sat)}$ value at 25°C of 1.05V at nominal current, our customers can achieve new levels of efficiency when used, for example, as inner switches in 3-level NPC topologies as found in UPS and PV inverters.

Low switching losses

Yet despite the unmatched low conduction losses, the device performance is not compromised by increased switching losses. And the total energy losses are low. As low as 1.6mJ at 25°C [1].

Low $V_{CE(sat)}$ Optimized TRENCHSTOP™ 5 L5
Competition – Trade off [2]



1) Datasheets value for 30A DuoPack IGBT, IKW30N65EL5
2) T_{vj} = 25°C, I_{CE} = 30A, R_g = 10Ω

www.infineon.com/trenchstop5-L5

Key Features

- Lowest saturation voltage $V_{CE(sat)}$ of only 1.05V [1]
- Low switching losses of 1.6mJ @ 25°C [1]
- High thermal stability of electrical parameters – only 2% drift with T_j increase from 25°C to 175°C
- Enhanced efficiency for 20% lower switching losses in TO-247 4pin Kelvin-Emitter package

Key Benefits

- Higher efficiency for 50Hz
- Longer lifetime and higher reliability of IGBT
- High design reliability due to stable thermal performance

Applications

- UPS – inner switches 3 Level NPC 1, NPC 2
- Solar – modified HERIC inverter
- AC Output – Al /Mg Welding

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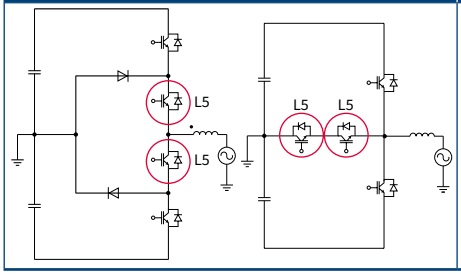
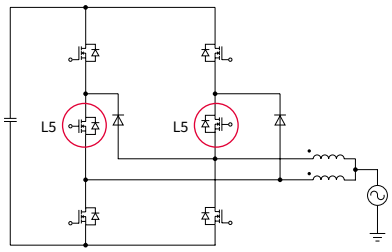
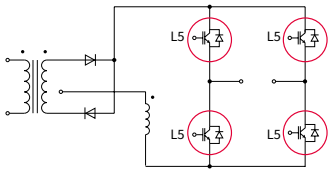
Optimal performance and high thermal stability

The mild positive temperature coefficient of $V_{CE(sat)}$ with only 2% drift under temperature change from 25°C to 175°C allows easy paralleling keeping the efficiency high. High efficiency and low switching losses of the L5 IGBT simplifies thermal management allowing to reduce the cooling infrastructure, using less heat sink and a smaller fan, thus significantly lowering the manufacturing costs.

Typical Topologies and Application for Low $V_{CE(sat)}$ L5 IGBT

3 level inverter type 1 NPC 1 & NPC 2	Modifies HERIC inverter	AC Output (Aluminium/Magnesium welding)
		

Exhanced efficiency, lower switching losses with innovative TO-247 4pin Kelvin-Emitter package

Low $V_{CE(sat)}$ L5 DuoPack IGBT in 75A is offered in an innovative TO-247 4pin Kelvin-Emitter package. When compared to the standard TO-247 package, the TO-247 4pin Kelvin-Emitter package modification allows 20% reduction of switching losses. For more information on TO-247 4pin Kelvin-Emitter package visit www.infineon.com/TO-247-4

The L5 low $V_{CE(sat)}$ TRENCHSTOP™ 5 [3)]

Package	TO-247	TO-247	TO-247	TO-247	TO-247 4pin
Partname	IKW30N65EL5	IKW30N65NL5	IGW30N65L5	IKW75N65EL5	IKZ75N65EL5
Current Class	30A	30A	30A	75A	75A
$V_{CE(sat)}$ [V]	1.05	1.05	1.05	1.05	1.05
V_{br} [V]	650	650	650	650	650
Q_g [nC]	168	168	168	436	436
E_{on} [mJ]	0.47	0.56	0.47	1.61	1.57
E_{off} [mJ]	1.35	1.35	1.35	3.20	3.20
Short description	TRENCHSTOP™ 5 L5 IGBT + Fast Rapid 1 Diode	TRENCHSTOP™ 5 L5 IGBT + Ultra Fast Rapid 2 Diode	Single TRENCHSTOP™ 5 L5 IGBT	TRENCHSTOP™ 5 L5 IGBT + Fast Rapid 1 Diode	TRENCHSTOP™ 5 L5 IGBT + Fast Rapid 1 Diode

3) Characterization measurement: T_{vj} = 25°C, V_{cc} = 400V, $I_c = I_{nom}$, V_{ge} = 0/15V, R_g = 10Ω, L = 60nH, C = 30pF. Energy loss incl. "tail" and diode reverse recovery

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