Product Brief

600 V CoolMOS™ C7 Gold in TOLL package

A new SMD package using Kelvin source concept

Infineon Technologies introduces the new CoolMOS™ C7 Gold technology in latest SMD TO-Leadless (TOLL) package.

The C7 Gold series (G7) for the first time brings together the benefits of the improved 600 V CoolMOS™ C7 Gold technology, 4pin Kelvin source capability and the improved thermal properties of the TOLL package to enable a possible SMD solution for high current hard switching topologies such as power factor correction (PFC) up to 3 kW and for resonant circuits such as high-end LLC.

Benefits to the customer are:

- Higher efficiency due to the improved C7 Gold technology and faster switching due to the package low parasitic source inductance and the 4pin Kelvin source concept
- Improved power density due to low $R_{DS(on)}$ in small footprint, by either replacing TO packages (height restrictions) or paralleling SMD packages due to thermal or $R_{DS(on)}$ requirements
- Production cost reduction by moving to SMD through quicker assembly times

Improved CoolMOS™ C7 Gold technology

Parameter	Package	$R_{DS(on)}$ (max) [mΩ]	Q_G (typ) [nC]	C_{oss} (typ) [pF]
Competitor A 600 V	D^2PAK	99	100	156
600 V CoolMOS™ C7 Gold (G7)	TOLL	102	34	27
Comparison	30% footprint reduction	Similar $R_{DS(on)}$ for comparison	66% lower than competitor	83% lower than competitor

TOLL package versus D^2PAK

Parameter	Footprint [mm^2]	$R_{DS(on)}$ (max) [mΩ]	Source inductance [nH]	Kelvin source feature
D^2PAK	150	87*	5	No
TOLL	115	28	1	Yes
Comparison	30% footprint reduction	68% lower $R_{DS(on)}$	80% lower inductance	Benefits in Kelvin source for efficiency and ease-of-use

* Best competitor

Key features

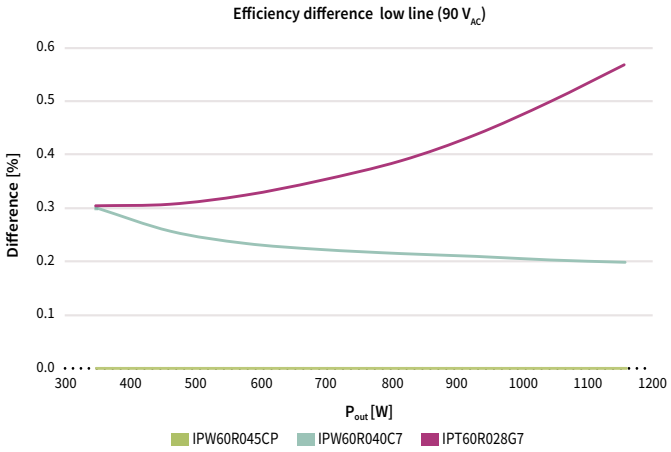
- **CoolMOS™ C7 Gold**
  - Gives best-in-class FOM $R_{DS(on)}$ x E_{oss} and $R_{DS(on)}$ x Q_G
  - Enables best-in-class $R_{DS(on)}$ in smallest footprint
- **TOLL package**
  - Inbuilt 4th pin Kelvin source configuration and low parasitic source inductance (~1 nH)
  - Is MSL1 compliant, total Pb-free, has easy visual inspection grooved leads
  - Enables improved thermal performance R_{th}

Key benefits

- FOM $R_{DS(on)}$ x Q_G is 16 percent better than previous 600 V C7 enabling higher efficiency
- Power density through best-in-class 28 mΩ in TOLL 115 mm^2 footprint
- Reducing parasitic source inductance by Kelvin source improves efficiency and ease-of-use
- TOLL package is easy to use and has the highest quality standards
- Improved thermals enable SMD TOLL package to be used in higher current designs than has been previously possible

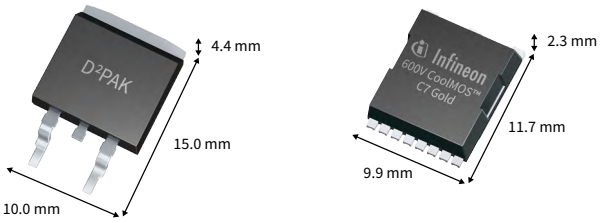
www.infineon.com/c7-gold-toll

Benefits in efficiency in PFC circuit



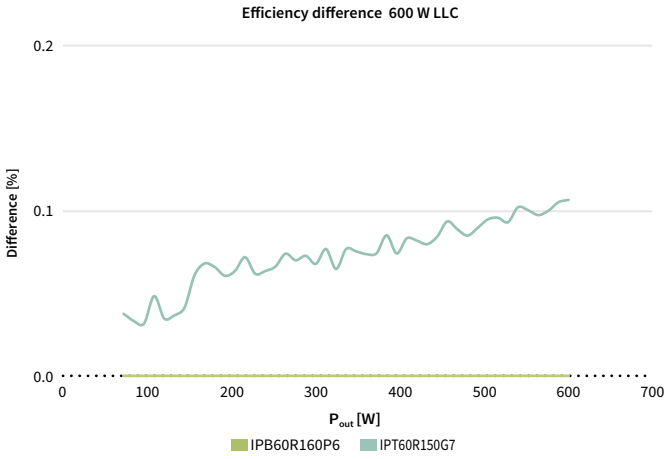
Performance gain of 0.6 percent full load efficiency gain TOLL versus TO-247 due to lower $R_{DS(on)}$ from TOLL and 4pin Kelvin source capability.

TO-Leadless package versus D²PAK



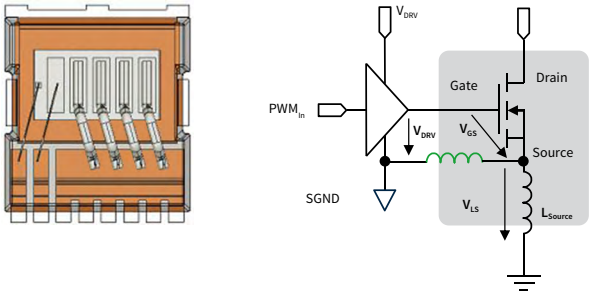
- 30 percent footprint reduction
- 50 percent height reduction
- 60 percent space reduction

Benefits in efficiency in LLC circuit



Improved performance in LLC circuit.

Four pin Kelvin source capability



- Separate pin “source-sense” delivers undisturbed signal to driver
- Higher efficiency at full load

Product portfolio 600 V CoolMOS™ C7 Gold (G7)

$R_{DS(on)}$ (max) mΩ	28	50	80	102	125	150
Part number	IPT60R028G7	IPT60R050G7	IPT60R080G7	IPT60R102G7	IPT60R125G7	IPT60R150G7

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