

APEC 2017 is upon us...

By Yuji Kakizaki*, LTEC Corporation

March 2017. It is nothing short of amazing to observe the broadening horizon of power



electronics over the past decade or so, as new technologies emerge, forming mature, new industry segments. Just think of green energy, vehicle electrification, driver assistance, wireless power transfer, wide bandgap semiconductors, server farms, even IoT lately. Just as last year, the **IEEE Applied Power Electronics Conference**, to be held during March 26-30, 2017, in Tampa, Florida, promises many [Yuji](#)

[Kakizaki, Exec. VP.](#) exiting topics in these fields and many others. Responding to these major trends and the accelerating pace of product development, LTEC Corporation, Japan's dominant provider of intellectual property analysis services, will also share some of its insights into advanced power electronics focusing on *automotive electronics* and *wide bandgap semiconductors*. We would like to invite you to visit our exhibit booth, No. 1339; browse through our latest analysis report brochures; and learn about the many innovative ways LTEC can offer tangible contributions to its clients during product development.

Exhibitor Presentation. LTEC Corporation will also share some of its innovative ideas, tools and practices on performing technical analysis and reverse engineering in close collaboration with its customers in the form of an Exhibitor Presentation on Wednesday, March 29, 12:00 PM-12:30 PM in Rooms 1/2. The title speaks for itself: ***“Improve new product positioning, reduce time to market, protect your IP through benchmarking and deep analysis.”*** If you plan to attend APEC 2017, please come by, be among the first fifty attendees to secure your free lunch box, and learn about the multiple benefits of LTEC's collaborative approach, which offers to enhance product definition, positioning, market timing, and patent portfolio development. We are a company large enough to provide meaningful assistance and small enough to be willing to listen and respond to your needs.

New technical analysis reports.

Learn about TSMC's Integrated Fan Out (InFO) wafer level package...

Using our proprietary delayering and high quality digitization technology, we extracted all five RDL layers used in TSMC's InFO package deployed in the A10 processor of Apple's iPhone7. Unlike its flip-chip substrate-based fan-out predecessors, InFO technology relies on multiple RDLs, improved chip alignment accuracy, and it can easily accommodate high I/O count. Even with the five RDLs package thickness is reduced by 20%. Additional benefits of the technology are 10% lower heat generation and 20% higher I/O speed. Many more details including cross-sections, L/S, thickness info of the RDL are in the report. Gerber, dxf, PADS (ASCII), ODB++ files are also available.

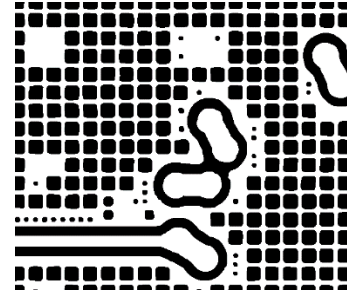
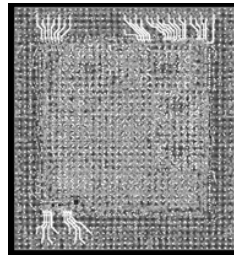
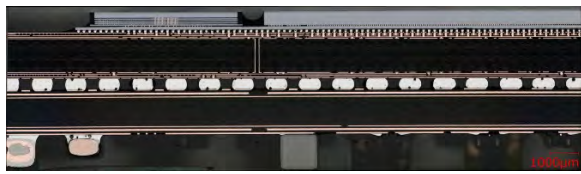


Fig1 a, b, c

Just released: Wolfspeed CAS325M12HM23.6mΩ, 1200V 2nd generation SiC half-bridge power module analysis report using new, lighter Al-SiC base plate instead of Cu. The report reveals how this state-of-the-art module achieves significant reduction in weight and volume and

continuous 175C operation. All relevant construction details including layout, EDX materials analysis are included. Note that LTEC has prepared other 2nd gen and 3rd gen SiC device analysis reports as well.



Fig2.....

Benchmarking Power Transistors and Power Modules for High-Temperature Operation (T_j~200C.) We have analyzed a representative spectrum of power transistors developed for T_j=150°C to 200°C and compared their structure and materials

to elucidate technologies essential to achieve high temperature operation. The results will be presented in the up-coming ITEC2017 conference in June and in form of a report thereafter.

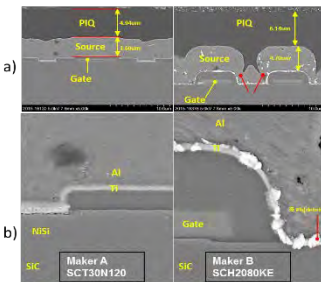
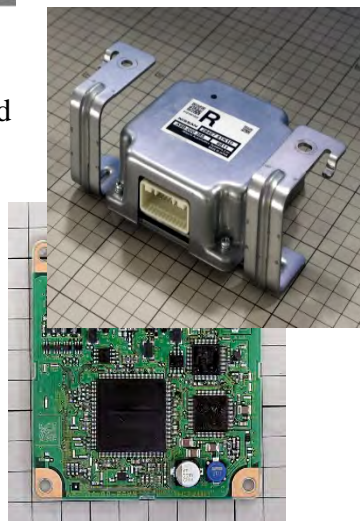


Fig3.....

This is the first automatic driving in the upon the ADAS ECU and performs speed control, steering control report reveals system PCB.

Benchmarking the Nissan Serena Pro Pilot ADAS ECU

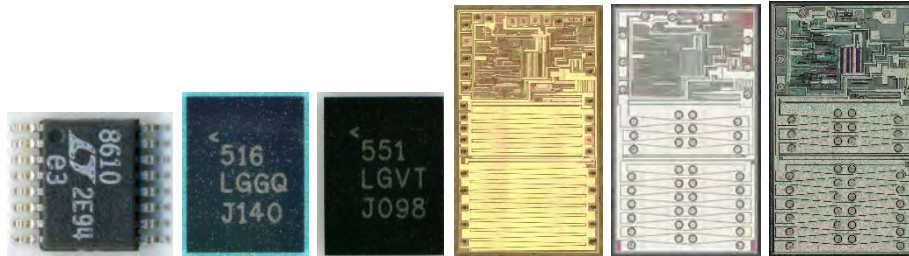


commercial vehicle that facilitates same line of a highway while relying the Pro Pilot camera module. The system tracking, stop and hold functions, throughout the entire speed range. This block diagram and the details of the main

Fig4 a, b.....

Click on the links below to review some of our technical analysis report brochures:

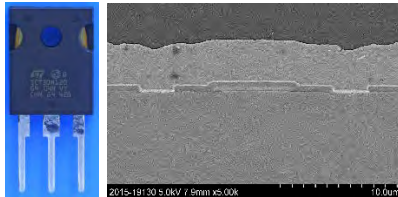
16G-0100-1: LT8610/14/40 DC-DC converter IC structure analysis



This report reveals technics to reduce conduction losses.

Fig5 a,b,c,d,e,f.....

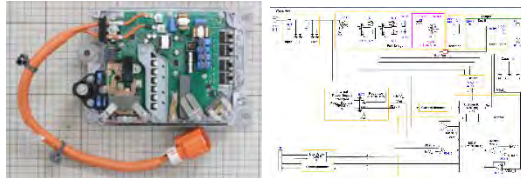
15L-5002-1: STMicro SCT30N120 SiC power semiconductor package analysis:



This report explains identifies the enablers of continuous operation at 200°C.

Fig6 a, b.....

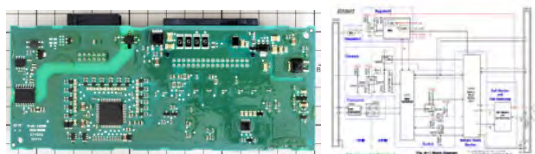
15H-0881-1: Nissan Xtrail DC-DC converter for plug-in hybrid electric vehicles



The report includes PCB layout, BOM, component sizes, and control circuit details.

Fig7 a, b.....

16G-0007-1 BMW X5 cell supervisory circuit analysis report



This report contains PCB analysis, circuit schematics, and comparison with the BMWi3

Fig8 a, b.....

13G-212-1-1: Toyota Prius headlight LED analysis

13G-675-1: Honda Accord HEV DC-DC converter

13H-0004-2-1: Bosch 77GHz radar module

15G-005-1: Toyota Prius Multi-cell battery monitor ASIC, retailed schematics

14G-0019-1: BMW-i3 battery management system

14G-0924-2: GaN Systems GS66508P GaN power semiconductor analysis

14G-0953-1: Valeo Integrated starter (ISG) generator teardown

14H-0129-1: Toyota Crown HV inverter control system

14H-0252-1: PSMA report on advanced packaging technologies

14H-0363-1-F: Rohm BM6104 isolated gate driver IC

14H-0954-1: STMicro SCT30N120 SiC power semiconductor

16G-0003-1: Panasonic PGA2609DV GaN power semiconductor

16G-0003-1-4: Panasonic PGA26E19BA GaN HEMT power semiconductor analysis

15G-0004-1-1: Rohm BSM180D12P3C007 3rd gen SiC power module

15G-0005-1: Toyota Prius BMS ASIC schematic analysis

15G0006-1: Toyota Prius ZVWS51 battery monitor system

15G-0008-1: Toyota Prius ZVWS51 motor inverter

15G-0010-1-1: Nissan X-trail DC-DC converter thermal analysis

16G-0005-1: Wolfspeed C3M0065090D 3rd gen SiC power MOSFET analysis

16L-0003-1: Linear Technologies LTC6811 battery monitor LSI for EVs and HEVs

Honsha: Please check the above what other items should we add?

Please stop by at **Booth 1339** and ask us how we could help your designers understand advanced products and technologies deployed in this field.

LTEC Corporation also provides a broad range of services in the field of Intellectual Property (IP) services from patent prior art search to in-depth technical analysis for the automotive industry. Visit our website www.ltecusa.com and let us know how we can help you keep up with the competition or help generate and protect your intellectual property.

*Yuji Kakizaki, Executive VP of LTEC Corporation is a semiconductor industry veteran, with over three decades of experience, in power electronics. He holds fifteen Japanese and eight US patents in the field of semiconductors and power electronics.

About LTEC Corporation

LTEC, Japan's dominant intellectual property analysis company, provides in-depth competitive reverse engineering analysis services for the research and development engineering and industrial legal communities in Japan, USA, the European Union, Korea, and Taiwan. LTEC helps its customers overcome intellectual property (patent) research, analysis, and protection challenges across all sectors of electronics. www.ltecusa.com



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