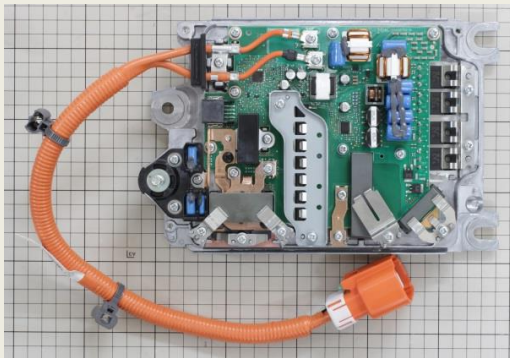
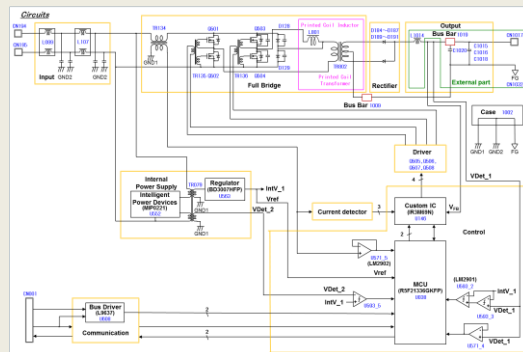


### DC-DC CONVERTER FOR THE NISSAN X-TRAIL PLUG-IN HYBRID VEHICLE

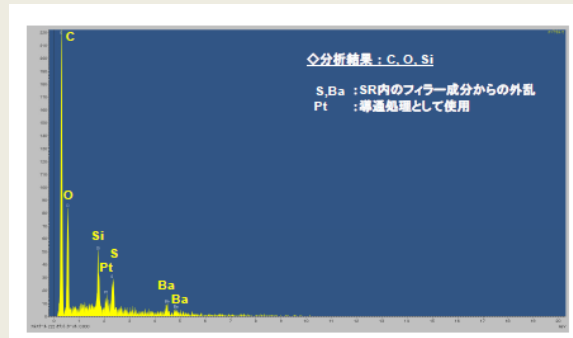
March 15, 2016. LTEC Corporation released its technical analysis report of a DC-DC converter system used in the NISSAN X-TRAIL. It uses the full bridge phase shift topology controlled by a custom ASIC. The module has an air-cooled thermal management system.



Top view of main PCB



Block diagram



Transformer material analysis

This 113 pages report reveals the PCB layout, BOM, component and circuit details. PCB pattern, component sizes and values, and control circuit details are included in the report. Transformer is built into the PCB. Detailed structure and material analysis of transformer are also included.

**Note:**

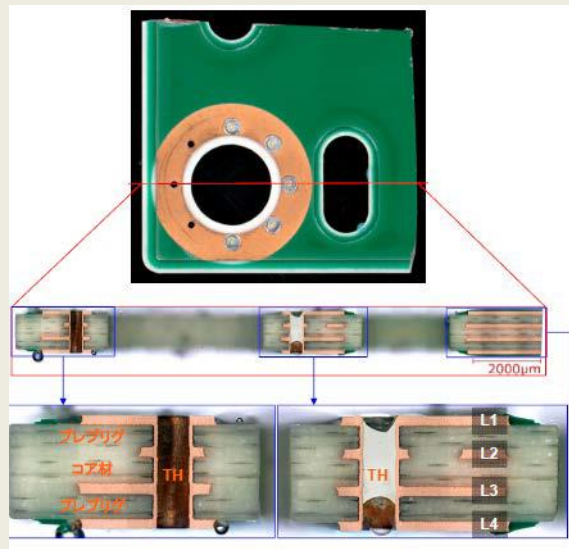
The listed report price may not be accurate as it decreases over time.

Please contact us for current report pricing [info@ltecusa.com](mailto:info@ltecusa.com)

15G-0011-1

# Table of Contents

	Page
1. Abstract	5
2. Teardown	12
3. PCB layout	21
4. Schematic diagram	43
5. Component details	46
6. Bill of materials (BOM)	51
7. Interface components	63
8. Sensor	65
9. Transformer details	
9.1. Transformer size	66
9.2. Ferrite core size	75
9.3. Transformer measurement	77
9.4. Cross-section by optical image	79
9.5. Cross-section by SEM	92
9.6. EDX composite analysis	103
9.7. Transformer analysis summary	111



Cross-section analysis of the transformer

15G-0011-1