Automotive Semiconductor Device Standardization

Background

Recent supply chain crises, such as the global semiconductor shortages of the early 2020s, have underscored the automotive industry's vulnerability to disruptions in the availability of critical components. Legacy semiconductor technologies have become increasingly fragmented, with a wide array of part numbers, package types, and specifications tailored to individual original equipment manufacturers (OEMs) and tier suppliers. This diversity, while historically functional, has complicated procurement and limited the scalability of production among semiconductor suppliers in multiple facilities. To address these issues, a coalition of leading automotive OEMs has developed this whitepaper to facilitate standardization of a select subset of legacy semiconductor technologies. The intention of this paper is the enhancement of supply chain resilience, with a secondary goal of reducing costs across the industry.

This document establishes a collaborative framework for standardizing key categories of legacy semiconductors by specifying a streamlined set of allowable packages, pinouts, and technical requirements already common among many automotive manufacturers. Our goal in publishing these recommended standards is to enable semiconductor manufacturers to focus investments on increasing production capacity to limited SKUs, rather than supporting a broad range of individualized part numbers. This approach strengthens supply chain resilience by improving component availability and predictability, while also yielding cost reductions to the whole supply chain through economies of scale and the promotion of broad based free and open competition with maximum scalability.

The OEMs authoring this whitepaper invite all automotive manufacturers and tier suppliers to utilize this standardized list of legacy semiconductors, thereby amplifying its impact on industry-wide resiliency and cost efficiency. By focusing on a common set of components, stakeholders can streamline design, maximize scalability, and reduce exposure to supply disruptions. The sections below set forth detailed information on recommended packages, pinouts, and technical specifications for each semiconductor category.

The recommendations in this document are aimed at maximizing efficiency and enabling scale that will promote competition and efficiency. Nothing herein should be construed to mandate compliance with these suggestions if any supplier of the components discussed herein elects to negotiate varying specifications among their base of present or future customers.

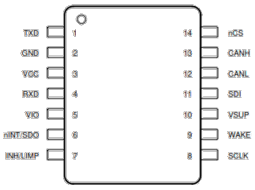
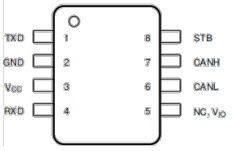
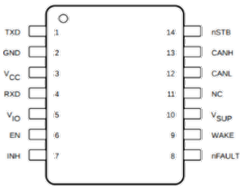
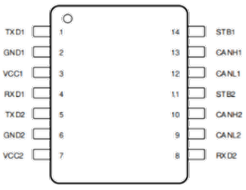
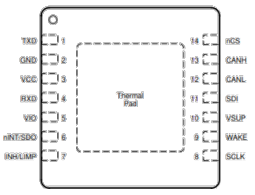
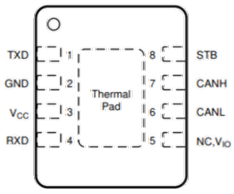
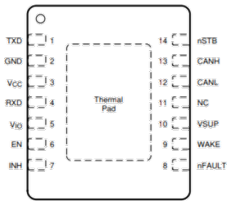
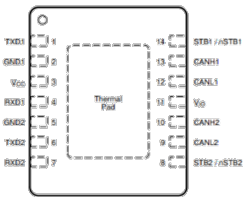
Aligned Devices

CAN Transceiver

Device Requirements:

- All CAN transceivers should comply with AEC-Q100. If copper wire bonds are used, transceiver should comply with AEC-Q006.
- All CAN transceivers shall comply with SAE J2962-1.

Packages and Pinouts Allowed:

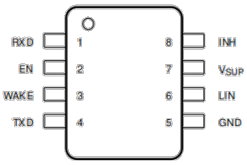
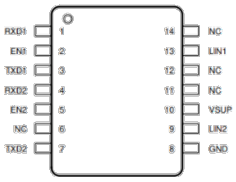
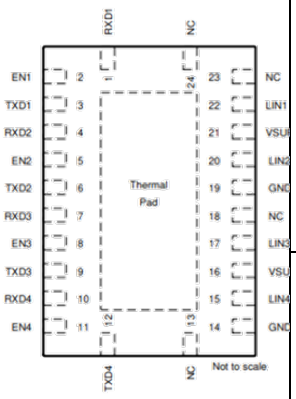
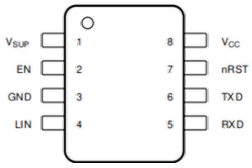
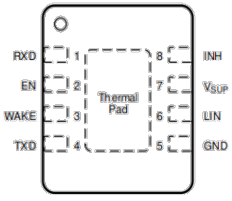
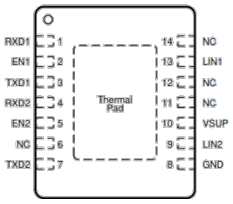
	Partial Networking	**Non-Partial Networking (Single)**		**Non-Partial Networking (Dual)**
Features	Selective Wake $INHV_{10}$	Selectable V_{10}	Wake INH V_{10}	Selectable V_{10}
Package & Pin-Out	SOIC-14  	SOIC-8  	SOIC-14  	SOIC-14 
	DFN/VSON-14  	DFN/VSON-8  	DFN/VSON-14  	DFN/VSON-14 

LIN Transceiver

Device Requirements:

- All LIN transceivers should comply with AEC-Q100; if copper wire bonds are used, transceiver should comply with AEC-Q006
- All LIN transceivers should comply with SAE J2962-2

Packages and Pinouts Allowed:

	Single Channel	**Dual Channel**	**Quad Channel**	**Single LIN+LDO**
Features	Dominant state time out Thermal Protection Wake INH	Dominant state time out Thermal Protection Wake INH	Dominant state time out Thermal Protection Wake INH	Dominant state time out Thermal Protection Voltage regulator supporting 3.3V/5V
Package & Pin-Out	SOIC-8 	SOIC-14 	VQFN-24 	SOIC-8 
	DFN/VSON-8 	DFN/VSON-14 		DFN/VSON-8