Introduction

Dallas-Maxim introduced a “low cost, drop-in replacement” short-haul octal LIU targeting IDT82V2048 and LXT384. The part number is DS26303. It boasts the following feature highlights:

- Low power
- Programmable per-channel T1/J1/E1 operation
- Software selectable impedance
- An integrated BERT

Feature Comparison

The following table lists major LIU features of IDT82V2048 and Maxim DS26303:

	IDT82V2048	Dallas-Maxim DS26303
Density	8 Channel SH	8 channel (SH)
Internal Tx and Rx Termination	External Impedance per 75/100/120 ohm	Software Selectable impedance 75/100/120 ohm
T1/E1/J1 Per Channel Programmable	Select T1/E1 Globally	Yes
MCLK Frequency	1.544MHz for T1 or 2.048MHz for E1	Nx1.544/Nx2.048MHz; n=1,2,3,4
Jitter Attenuator (JA)	1 per link (TX or RX per control)	1 per link (TX or RX per control)
TX Pulse Shaping	Programmable	Programmable
TX Power Down	Available	Available
Alarm Generation and Detection	AIS RAI	AIS RAI
LOS Indication	N/A	N/A
Processor I/F	8-bit Parallel/Serial Serial Interface Hardware mode	8-bit Parallel/Serial Serial Interface
Jitter Attenuator FIFO depth	64/32 bit	128/32 bit
Loop-back	Analog/Digital/Remote Dual Loop-back In-band Loop-back	Analog/Digital/Remote Dual Loop-back N/A
Short-circuit detection	Yes	Yes
PRBS/QRBS Gen/Det	N/A	1 for 8 channels 2^9-1, 2^11-1, 2^15-1 2^20-1, 2^23-1, Repetitive
G.772 Noninvasive Monitor	Available	Available
Power Consumption (Max.)	662mW min.~2670mW max	1650 W max
Package Area and Type	PBGA-160	LQFP-144

Feature Comparison Summary

Based on the comparison results, it's noticed that the following features differentiate DS26303 from 82V2048:

1. Software programmable internal/external impedance for both RX and TX.
2. Per channel programmable of T1, J1 or E1 operation.
3. An integrated BERT generator/detector that supports a more complete list of PRBS and repetitive patterns for testing.
4. A single clock frequency for MCLK for both T1 or E1 operation.
5. Device package is smaller (less pin count), seemingly with less power consumption.

Competitive Analysis

The following proposed “workarounds” are provided based on the above features that 82V2048 is limited. Some analytical comments are provided as well.

Differentiating Features	Possible “workaround” for 82V2048	Comments
Software programmable internal impedance	For receive impedance, analog switches may be used to select 75ohm, 100ohm or 120ohm termination impedance (Note 1)	With customer's strong incentive for less components, less PCB space, it's far fetched unless customer does not have a requirement for this feature
Per channel T1/J1 or E1 operation	It's limited by its global selection of T1 or E1 operations	No comment
BERT	With customer design most likely having an FPGA, BERT functions can be implemented in system FPGA	It could be convincible sometimes, but a hard sell other times
Single frequency for MCLK for T1 or E1	Seeking a simple, cost-effective femto clock generator with 1.544MHz or 2.048MHz selectable	If such a clock source is available, this is not an issue
Smaller Package running greener	While package size and pin count unchangeable, power consumption could be similar	This is not likely an issue

Note 1: The only usable analog switch (meaning the one with tolerance of -3.6 ~3.6V DC voltages) is manufactured by Dallas-Maxim.

From IDT's portfolio, 82P2816/82P2508 may be a better device to compete with Dallas-Maxim DS26303 because 82P2816/82P2508 is a newer multi-channel LIU device with most of DS26303's differentiating features covered. The drawback is that 82P2816/82P2508 is a 16-channel LIU device. When used to compete with DS26303, an octal LIU device targeted to replace 82V2048, 82P2816/82P2508 endures a much bigger package, and therefore a higher cost.

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