

Sponcoring Companies		<i>Broadcom</i>	<i>Level One</i>	<i>Lucent</i>	<i>ComCore</i>
<b>Requirements</b>	<b>Definition</b>	<b>QAM25</b>	<b>TX/T2</b>	<b>CAP12</b>	<b>PR9</b>
	Noise Margin	<b>3.25dB</b>	3.1dB	3.1dB	3dB
<b><u>Magnetics:</u></b>					
Frequency Limits	Min - Max	0-75MHz	0-80MHz	100k-100MHz	0-75MHz
<b><u>Converters:</u></b>					
<b><u>A/D Converter:</u></b>					
A/D Resolution	Min Ideal Resolution	6bit	5.5bit	6bit / 5.5bit	<b>6bit</b>
A/D Speed	Max	187.5MHz	125MHz	250MHz	167MHz
Dynamic Range	Max		1.8V P-P		
Peak-to-RMS Ratio	Max				<b>11dB</b>
<b><u>D/A Converter:</u></b>					
D/A Resolution	Min Ideal Resolution	6bit	5 Levels/2.5bit	6bit / 7bit	3.2bit
D/A Speed	Max	187.5MHz	125MHz	250MHz	167MHz
<b><u>Analog Filters:</u></b>					
Transmit Filter		<b>RC1/100MHz</b>	RC1/100MHz	RC1-4ns rise	<b>RC1-83/66MHz</b>
Receive Filter		<b>BW5/93.75MHz</b>	BW2/100MHz	BW5/100MHz	<b>BW2-83/66MHz</b>
<b><u>Digital Filters:</u></b>					
Transmit Filter		<b>42T@62.5MHz</b>	none	48T@83.3MHz	none
Receive Filter		<b>none</b>	none	none	none
<b><u>Line Signal Conditions:</u></b>					
Launch Level (Differential)		<b>2.0V P-P</b>	2V P-P	2V P-P	<b>3.2V P-P</b>
<b><u>Baseline-Wander:</u></b>					
Analog Correction	Yes - No	No	No	No	No
Digital Correction	Yes - No	No	Yes	No	Yes

<b>Requirements</b>	<b>Definition</b>	<b>QAM25</b>	<b>TX/T2</b>	<b>CAP12</b>	<b>PR9</b>
	Noise Margin	<b>3.25dB</b>	3.1dB	3.1dB	3dB
<b><u>DSP:</u></b>					
Fraction Spacing		T	T	T/3	T
FFE-# of Real Taps		<b>12T@187.5MHz</b>	10T@125MHz	36T@83.3MHz	<b>14/20T@167MHz</b>
DFE-# of Real Taps		<b>6T@125MHz</b>	8T@125MHz	20T@83.3MHz	<b>19/24T@167MHz</b>
DFE-Coefficient Resolution		10bit	10bit	8bit	9bit
NEXT Canceller		18T@125MHz	12T@125MHz	24T@83.3MHz	<b>16T@167MHz</b>
ECHO Canceller		50T@125MHz	30T@125MHz	80T@83.3MHz	<b>45T@167MHz</b>
Jitter Tolerance (P-P in ns)	Uniform Distribution		<b>1.3ns</b>		
Jitter Tolerance (P-P in ns)	Gaussian Distribution	<b>6ns</b>			
Enhancement Coding	# of Stages	None	Viterbi-15	None	<b>RS (24,18)</b>
Latency	Bit Times BT < 40BT	<b>34.5BT</b>	35BT	31BT	<b>34BT</b>
<b><u>Measures of Comparison:</u></b>					
WC Noise Immunity (Crane)		<b>60mV P-P</b>	170mV P-P	130mV P-P	<b>145mV P-P</b>
Emissions					
Margin (FEXT present)		<b>1.74dB</b>	2.6dB	2.4dB	<b>2.7dB</b>
Estimated Gate Count		<b>170k</b>	110k	206k	<b>225k</b>
Added Complexity for TX					
Technology Type		CMOS	CMOS	CMOS	CMOS
<b><u>Power Consumption:</u></b>					
Analog		<b>0.9W</b>	1.0W	1.0W	<b>1.2W</b>
Estimated Total		<b>2.9W (0.35um)</b>	2.1W (0.35um)	3.3W (0.35um)	<b>3.4W (0.35um)</b>
		<b>2.1W (0.25um)</b>			

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	Noise Margin	<b>10.15dB</b>	9.7dB	9.8dB	10dB
<b><u>Magnetics:</u></b>					
Frequency Limits	Min - Max	0-75MHz	0-80MHz	100k-100MHz	0-75MHz
<b><u>Converters:</u></b>					
<b><u>A/D Converter:</u></b>					
A/D Resolution	Min Ideal Resolution	7bit	6.5bit	7bit	<b>7bit</b>
A/D Speed	Max	187.5MHz	125MHz	250MHz	167MHz
Dynamic Range	Max		1.8V P-P		
Peak-to-RMS Ratio	Max				<b>11dB</b>
<b><u>D/A Converter:</u></b>					
D/A Resolution	Min Ideal Resolution	7bit	5 Levels/2.5bit	7bit	<b>3.2bit</b>
D/A Speed	Max	187.5MHz	125MHz	250MHz	167MHz
<b><u>Analog Filters:</u></b>					
Transmit Filter		<b>SP/100MHz</b>	RC-1st Order	RC-4ns rise	<b>RC1-83MHz</b>
Receive Filter		<b>BW5/93.75MHz</b>	BW2/100MHz	BW5/100MHz	<b>BW2-83MHz</b>
<b><u>Digital Filters:</u></b>					
Transmit Filter		<b>42T@62.5MHz</b>	none	48T@83.3MHz	none
Receive Filter		<b>none</b>	none	none	none
<b><u>Line Signal Conditions:</u></b>					
Launch Level (Differential)		<b>2.0V P-P</b>	2V P-P	2V P-P	3.2V P-P
<b><u>Baseline-Wander:</u></b>					
Analog Correction	Yes - No	No	No	No	No
Digital Correction	Yes - No	No	Yes	No	Yes

<b>Requirements</b>	<b>Definition</b>	<b>QAM25</b>	<b>TX/T2</b>	<b>CAP12</b>	<b>PR9</b>
	Noise Margin	<b>10.15dB</b>	9.7dB	9.8dB	10dB
<b><u>DSP:</u></b>					
Fraction Spacing		T	T		T
FFE-# of Real Taps		<b>12T@187.5MHz</b>	14T@125MHz	36T@83.3MHz	<b>32T@167MHz</b>
DFE-# of Real Taps		<b>6T@187.5MHz</b>	10T@125MHz	32T@83.3MHz	<b>22T@167MHz</b>
DFE-Coefficient Resolution		10bit	10bit	8bit	9bit
NEXT Canceller		50T@125MHz	54T@125MHz	60T@83.3MHz	<b>80T@167MHz</b>
ECHO Canceller		120T@125MHz	120T@125MHz	200T@83.3MHz	<b>120T@167MHz</b>
Jitter Tolerance (P-P in ns)	Uniform Distribution		1.6ns		
Jitter Tolerance (P-P in ns)	Gaussian Distribution	<b>10ns</b>			
Enhancement Coding	# of Stages	None	Viterbi-15	None	<b>RS (24,18)</b>
Latency	Bit Times BT < 40BT	<b>34.5BT</b>	35BT	31BT	<b>34BT</b>
<b><u>Measures of Comparison:</u></b>					
WC Noise Immunity (Crane)		<b>65mV P-P</b>	180mV P-P	130mV P-P	<b>145mV P-P</b>
Emissions					
Margin (FEXT present)		<b>7.08dB</b>	7.0dB	7.0dB	<b>8.0dB</b>
Estimated Gate Count		<b>348k</b>	350k	380k	<b>370k</b>
Added Complexity for TX					
Technology Type		CMOS	CMOS	CMOS	CMOS
<b><u>Power Consumption:</u></b>					
Analog		<b>0.9W</b>	1.0W	1.0W	<b>1.4W</b>
Estimated Total		<b>4.4W (0.35um)</b>	3.8W (0.35um)	5.2W (0.35um)	<b>4.5W (0.35um)</b>
		<b>3.1W (0.25um)</b>			