淘宝店铺
煜电科技

车载以太网转换器介绍

武汉煜电科技有限公司

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YD-1000BaseT1

1.产品特点介绍
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YD-1000/100BaseT1

1.产品特点介绍
2.接口及框图介绍
3.使用说明介绍
4.测试报告

01 YD-100BaseT1产品特点介绍（NXP TJA1101方案）

本产品用于车载两线以太网100baseT1接口与标准以太网RJ45之间的物理层双向数据转换

采用主流芯片NXP TJA1101设计，相比老一代tja1100稳定性更好，接口防护能力更强

铝合金外壳，散热性好，更结实耐用

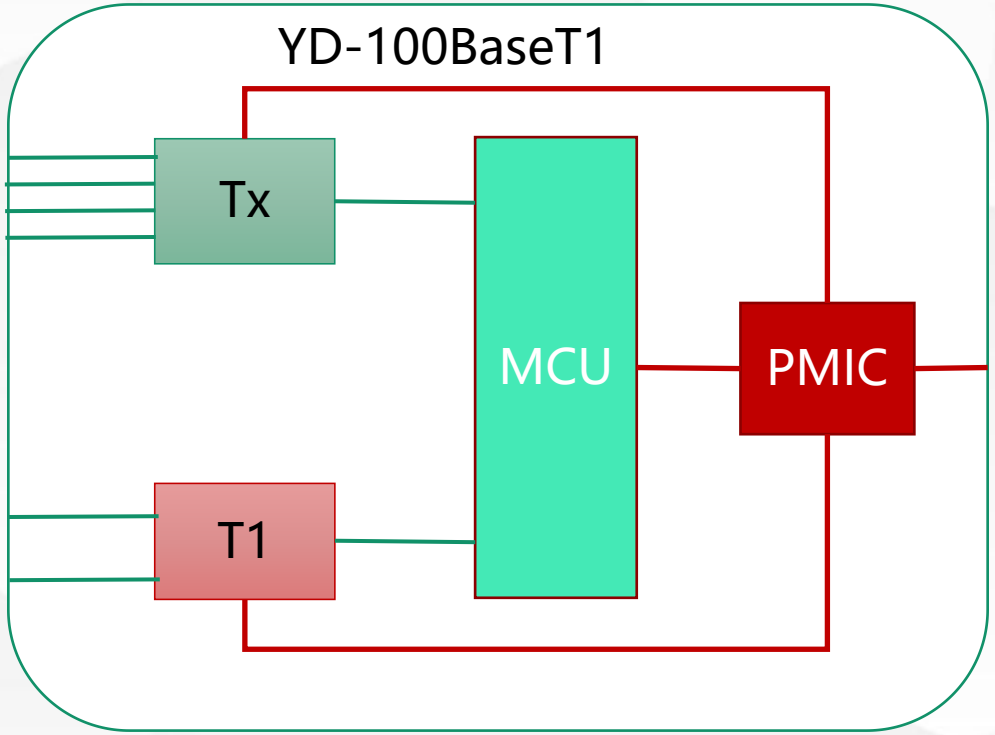
带状态指示灯：与车载ecu链接状态，电源状态，RJ45链接状态

宽电压范围输入：DC9-36V或usb 5v

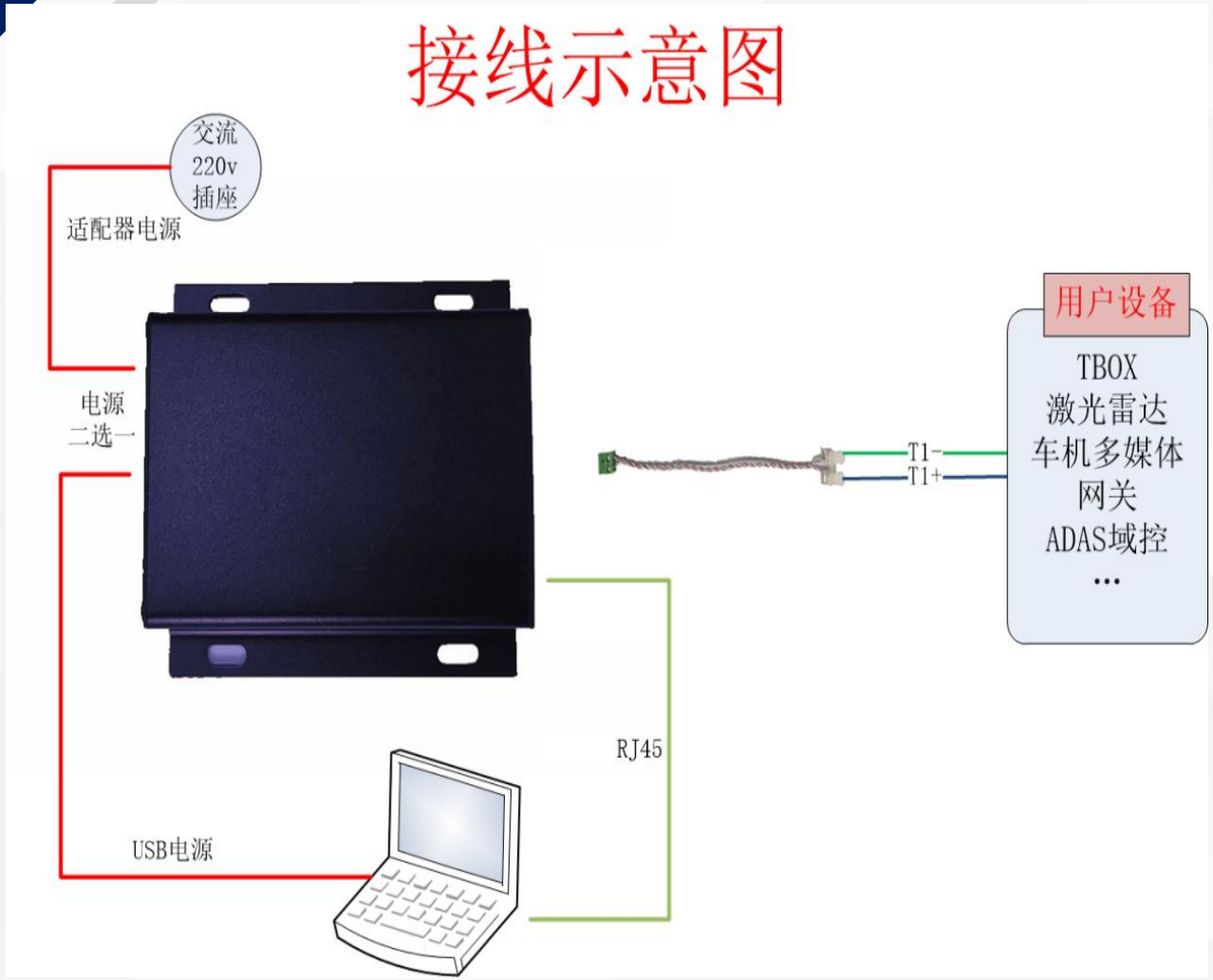
可切换主从模式，切换后无需复位或重启，立即生效

01 YD-100BaseT1接口及框图介绍

技术参数		
产品说明	产品名称	车载以太网转换器
	产品型号	YD-100BaseT1
	传输速度	100Mbits/sec
	主从模式	拨码开关切换，左从右主，可带电切换，立即生效
电源	供电电压	DC 9-36v/usb 5v
	功耗	＜2w
	接口	DC 11*9mm 或 mirco usb
	指示灯	Power红灯亮：供电正常
T1	IC	NXP TJA1101
	接口	HT 5.08mm/2P 带转接头
	指示灯	Link绿灯亮：转换器与用户设备连接成功
Tx	IC	KSZ8041
	接口	RJ45 16*14mm 带指示灯
	指示灯	绿灯亮：设备连接成功，黄灯闪：数据传输
防护	电源保护	电源反接，过压，过流
	静电防护	±10kv接触放电
环境温度	工作温度	-20-75℃
	存储温度	-20-85℃
结构	材质	铝合金
	尺寸	84*85*25mm



01 YD-100BaseT1使用说明介绍



1.按照左图方式连接设备
2.打开电源开关，电源红灯点亮
3.link绿灯点亮说明转换器与车载设备物理层链接成功
4.rj45网口灯点亮说明电脑与转换器物理层链接成功
5.待所有灯点亮后，电脑与车载设备IP设置为同一网段，用电脑ping车载设备，若ping通说明电脑与车载设备之间能正常收发数据
6.打开客户上位机进行用户测试

01 YD-100BaseT1测试报告

1.电源测试-----纹波

Output Ripple Measurement

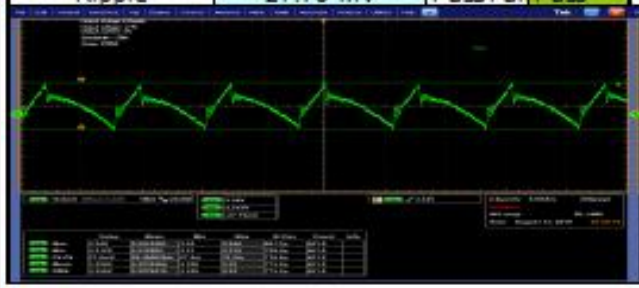
Test Condition:

1.The loading is setting to Imin or Imax at steady static.
2.adjusting voltage scale 10mV/div, and set offset to Vout, set time scale to 2~10us/div.
3.The measure need take bandwidth to 20BW and full BW
4.Put a 9x9 cm DC fan and the distance is about 5cm between board (regulator side)

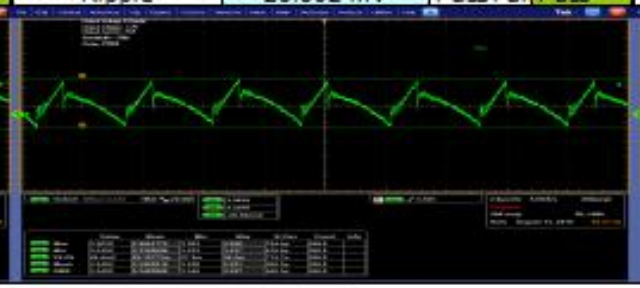
SPEC Description:

Input Voltage(V)			Output Voltage(V)			Output Current(A)			Ripple
Min	Typical	Max	Min	Typical	Max	Min	TDC	Max	Max
9 V	24 V	36 V	3.135 V	3.3 V	3.465 V	0.2 A	0.6 A	1.2 A	132 mV

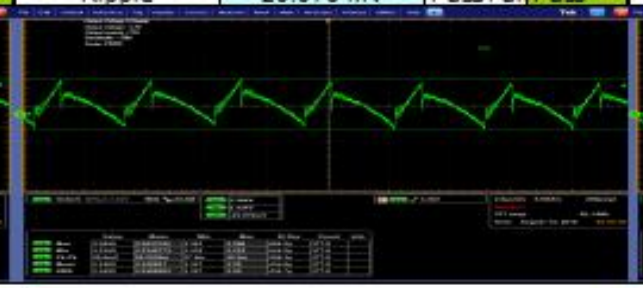
Load Imin					
Time scale: 2us/div, 20MHz BW, Persistence off					
RMSmin	3.326 V	RMSmax	3.33 V	Pass/Fail	Pass
Ripple	27.75 mV			Pass/Fail	Pass



Load Imax					
Time scale: 2us/div, 20MHz BW, Persistence off					
RMSmin	3.348 V	RMSmax	3.351 V	Pass/Fail	Pass
Ripple	28.592 mV			Pass/Fail	Pass



Input voltage +5%, Load Imax					
Time scale: 2us/div, 20MHz BW, Persistence off					
RMSmin	3.347 V	RMSmax	3.35 V	Pass/Fail	Pass
Ripple	29.976 mV			Pass/Fail	Pass



Input voltage -5%, Load Imax					
Time scale: 2us/div, 20MHz BW, Persistence off					
RMSmin	3.348 V	RMSmax	3.351 V	Pass/Fail	Pass
Ripple	30.2 mV			Pass/Fail	Pass

Load Imin					
Time scale: 10us/div, 20MHz BW, Persistence off					
RMSmin	3.326 V	RMSmax	3.329 V	Pass/Fail	Pass
Ripple	28.15 mV			Pass/Fail	Pass

Load Imax					
Time scale: 10us/div, 20MHz BW, Persistence off					
RMSmin	3.346 V	RMSmax	3.349 V	Pass/Fail	Pass
Ripple	29.718 mV			Pass/Fail	Pass

Input voltage +5%, Load Imax					
Time scale: 10us/div, 20MHz BW, Persistence off					
RMSmin	3.348 V	RMSmax	3.35 V	Pass/Fail	Pass
Ripple	30.192 mV			Pass/Fail	Pass

Input voltage -5%, Load Imax					
Time scale: 10us/div, 20MHz BW, Persistence off					
RMSmin	3.348 V	RMSmax	3.351 V	Pass/Fail	Pass
Ripple	30.2 mV			Pass/Fail	Pass

01 YD-100BaseT1测试报告

1.电源测试-----动态负载响应

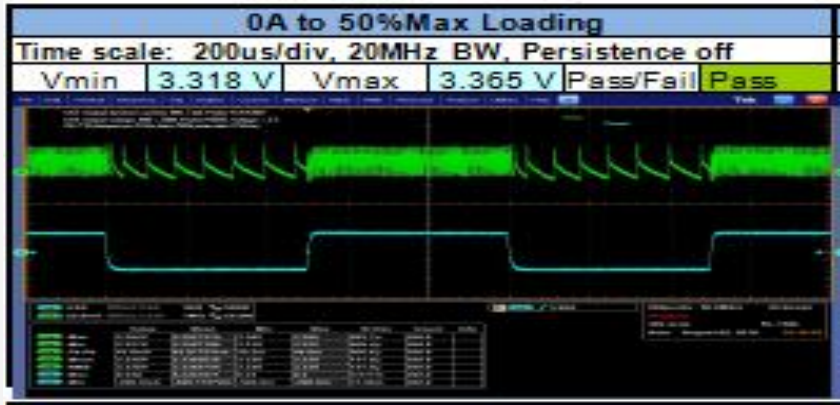
Dynamic Loading Measurement

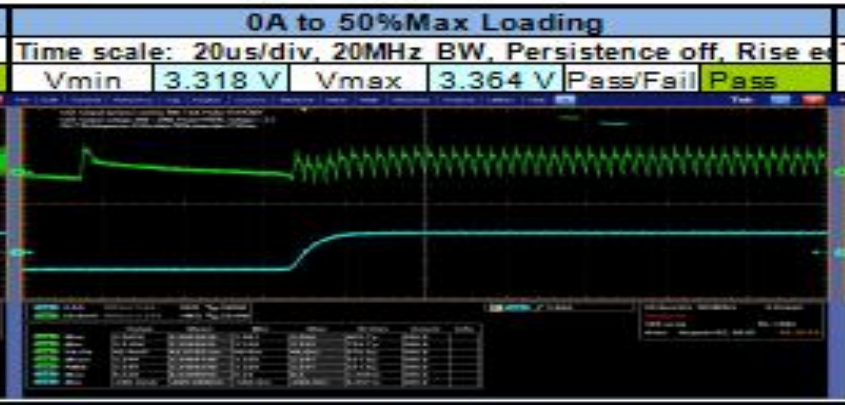
Test Condition:

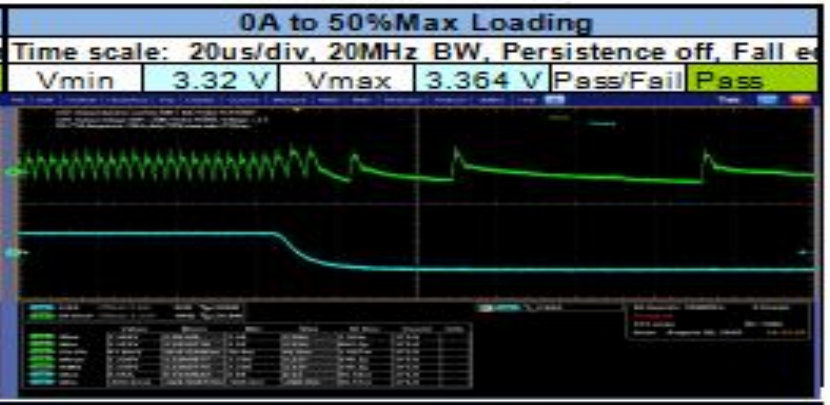
1.Dynamic current step1, 0A to 50% of Imax; Dynamic current step2, 50% of Imax to Imax.
2.Set the load sw-freq.=1kHz, duty=50%, slew rate= 2.5A/us.
3.The measure need take bandwidth to 20M BW
4.Put a 9x9 cm DC fan and the distance is about 5cm between board (regulator side)

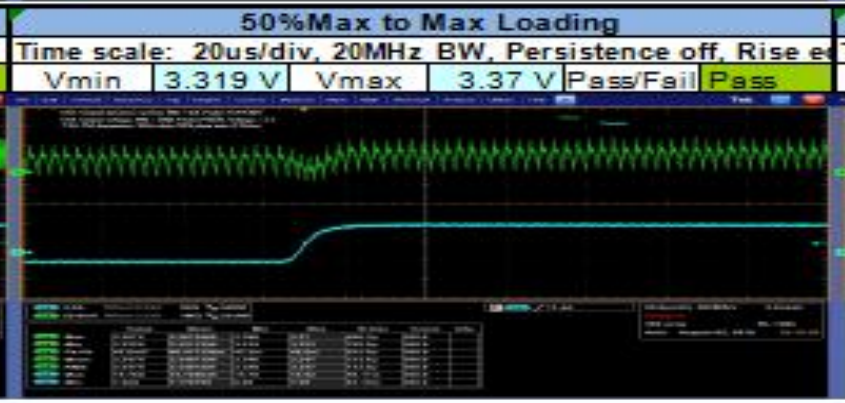
SPEC Description:

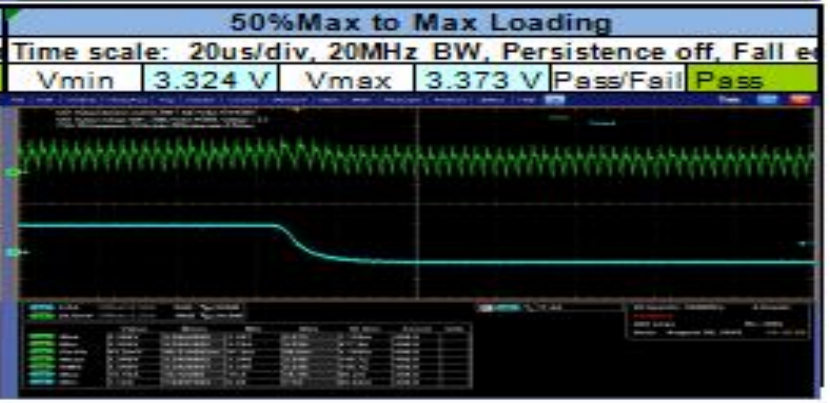
Input Voltage			Output Voltage			Output Current		
Min	Typical	Max	Min	Typical	Max	Min	TDC	Max
9 V	24 V	36 V	3.135 V	3.3 V	3.465 V	0.2 A	0.6 A	1.2 A











01 YD-100BaseT1测试报告

1.电源测试-----过流保护

Over current protection (OCP)

Test Condition:

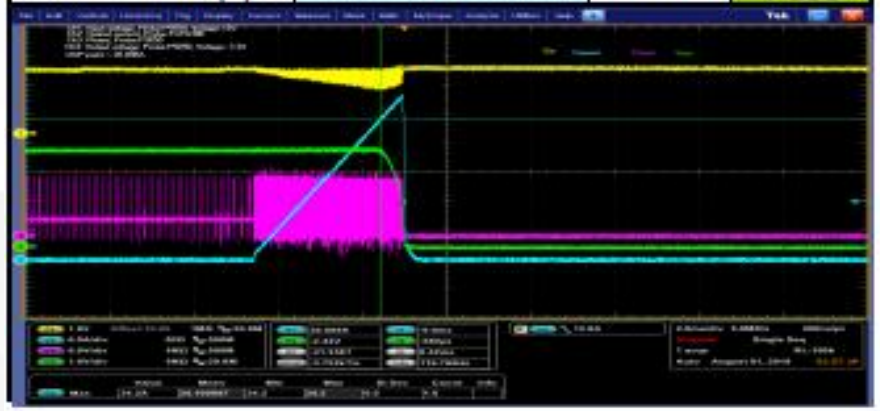
1.Take a >500 W power supply and remove OCP function of +12V to test OCP.
2.Use the tool of ADI's Interposer to adjust the loading.
3.Over current testing will be tested with using an external load set in "Constant Current" mode.
4.Measure the output current(Iout), Vcore,Phase and Vin waveform.

SPEC Description:

Input Voltage			OCP Point		
Min	Typical	Max	Min	Typical	Max
9V	24V	36V		1.5 A	

CH1	CH2	CH3	CH4
Vin	Current	Phase	Vout

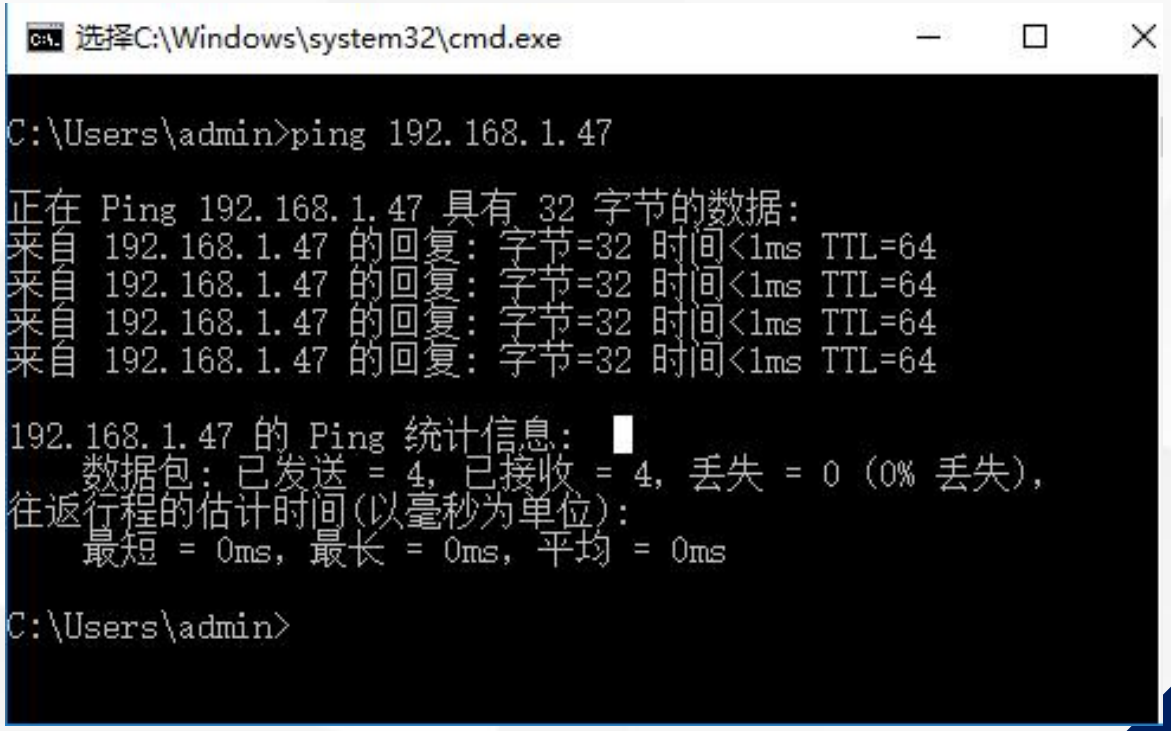
Time scale: 2ms/div, Full BW, Persistence off			
Test Value (A)	1.5	Pass/Fail	Pass



01 YD-100BaseT1测试报告

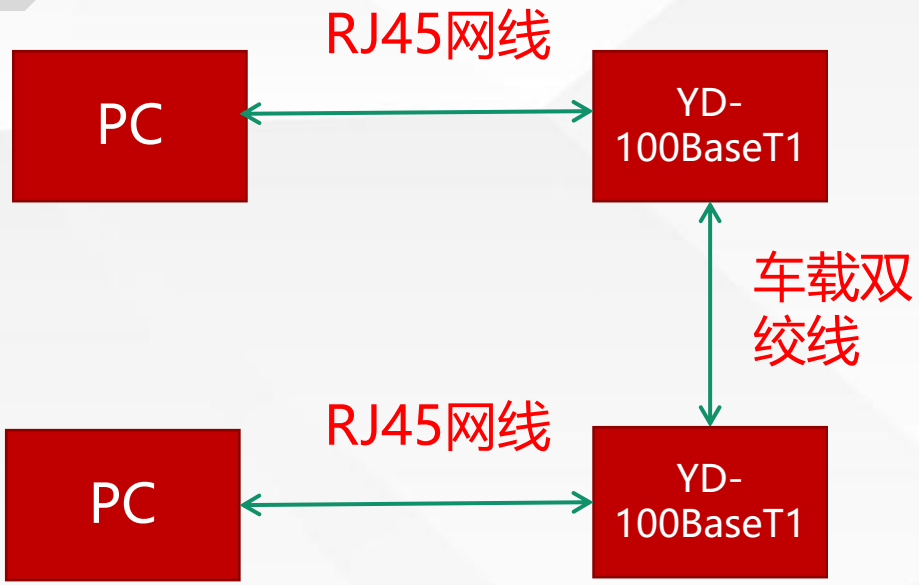
2.功能测试-----连通性测试

1.PC设置IP，必须要与被测设备是同一网段
2.PC启动doc窗口，输入ping指令，若能ping通说明整条链路连接成功



01 YD-100BaseT1测试报告

2.功能测试-----传输带宽吞吐量测试



1.按照上图链接方式进行测试
2.两个PC设置成同一网段
3.启动iperf就发送指令进行测试，传输带宽接近100Mbit/s

```
C:\Windows\system32\cmd.exe
iperf Done.

C:\Users\admin>iperf3 -c 169.254.163.40 -n 10000M -i 30
Connecting to host 169.254.163.40, port 5201
[  4] local 169.254.163.45 port 26615 connected to 169.254.163.40 port 5201
[ ID] Interval           Transfer     Bandwidth
[  4]   0.00-30.00  sec   336 MBytes  93.8 Mbits/sec
[  4]  30.00-60.00  sec   336 MBytes  94.1 Mbits/sec
[  4]  60.00-90.00  sec   335 MBytes  93.8 Mbits/sec
[  4]  90.00-120.00 sec   335 MBytes  93.6 Mbits/sec
[  4] 120.00-150.00 sec   335 MBytes  93.7 Mbits/sec
[  4] 150.00-180.00 sec   335 MBytes  93.7 Mbits/sec
[  4] 180.00-210.00 sec   335 MBytes  93.8 Mbits/sec
[  4] 210.00-240.00 sec   336 MBytes  93.8 Mbits/sec
[  4] 240.00-270.00 sec   334 MBytes  93.5 Mbits/sec
[  4] 270.00-300.00 sec   336 MBytes  94.0 Mbits/sec
[  4] 300.00-330.00 sec   335 MBytes  93.8 Mbits/sec
[  4] 330.00-360.00 sec   336 MBytes  93.8 Mbits/sec
[  4] 360.00-390.00 sec   334 MBytes  93.4 Mbits/sec
[  4] 390.00-420.00 sec   334 MBytes  93.4 Mbits/sec
[  4] 420.00-450.00 sec   335 MBytes  93.7 Mbits/sec
[  4] 450.00-480.00 sec   336 MBytes  94.0 Mbits/sec
[  4] 480.00-510.00 sec   333 MBytes  93.2 Mbits/sec
[  4] 510.00-540.00 sec   336 MBytes  93.9 Mbits/sec
[  4] 540.00-570.00 sec   335 MBytes  93.6 Mbits/sec
[  4] 570.00-600.00 sec   336 MBytes  93.9 Mbits/sec
[  4] 600.00-630.00 sec   336 MBytes  94.1 Mbits/sec
[  4] 630.00-660.00 sec   336 MBytes  93.8 Mbits/sec
[  4] 660.00-690.00 sec   334 MBytes  93.3 Mbits/sec
[  4] 690.00-720.00 sec   332 MBytes  92.9 Mbits/sec
[  4] 720.00-750.00 sec   334 MBytes  93.5 Mbits/sec
[  4] 750.00-780.00 sec   334 MBytes  93.4 Mbits/sec
[  4] 780.00-810.00 sec   333 MBytes  93.0 Mbits/sec
[  4] 810.00-840.00 sec   336 MBytes  93.8 Mbits/sec
[  4] 840.00-870.00 sec   336 MBytes  93.9 Mbits/sec
[  4] 870.00-895.49 sec   286 MBytes  94.2 Mbits/sec
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth
[  4]   0.00-895.49 sec  9.77 GBytes  93.7 Mbits/sec                  sender
[  4]   0.00-895.49 sec  9.77 GBytes  93.7 Mbits/sec                  receiver

iperf Done.
```

02 YD-1000BaseT1产品特点介绍（Ti DP83TG720方案）

本产品用于车载两线以太网1000baseT1接口与标准以太网RJ45之间的物理层双向数据转换

采用主流芯片**Ti DP83TG720**设计,性能优良，抗干扰性好，可与博通，marvell互连

铝合金外壳，散热性好，更结实耐用

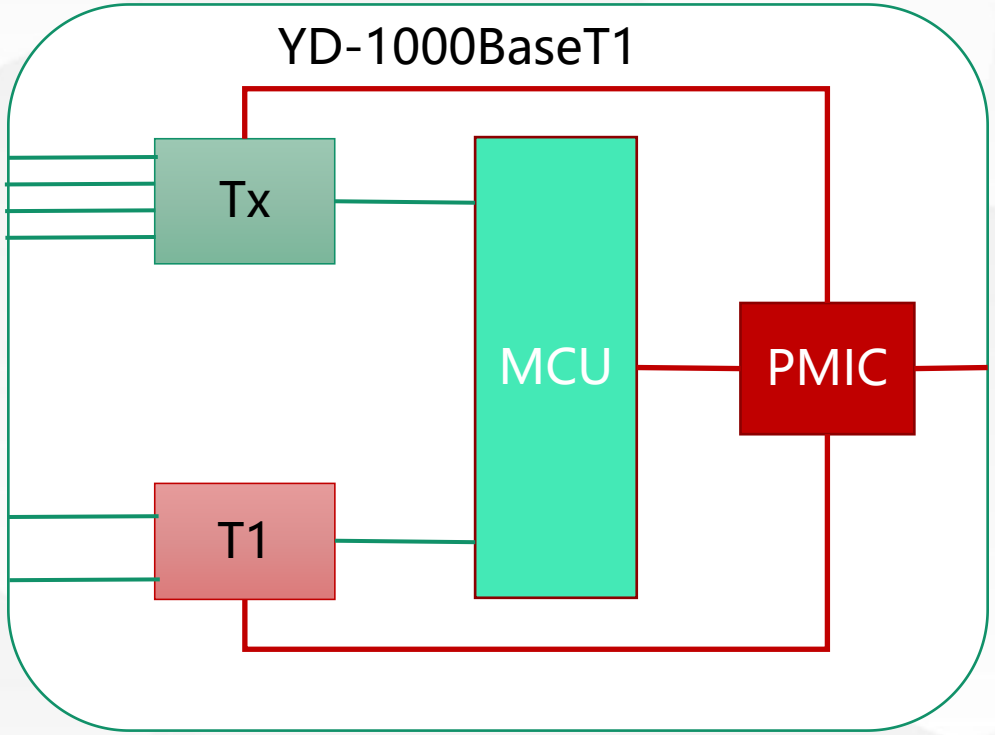
带状态指示灯：与车载ecu链接状态，电源状态，RJ45链接状态

宽电压范围输入：DC9-36V

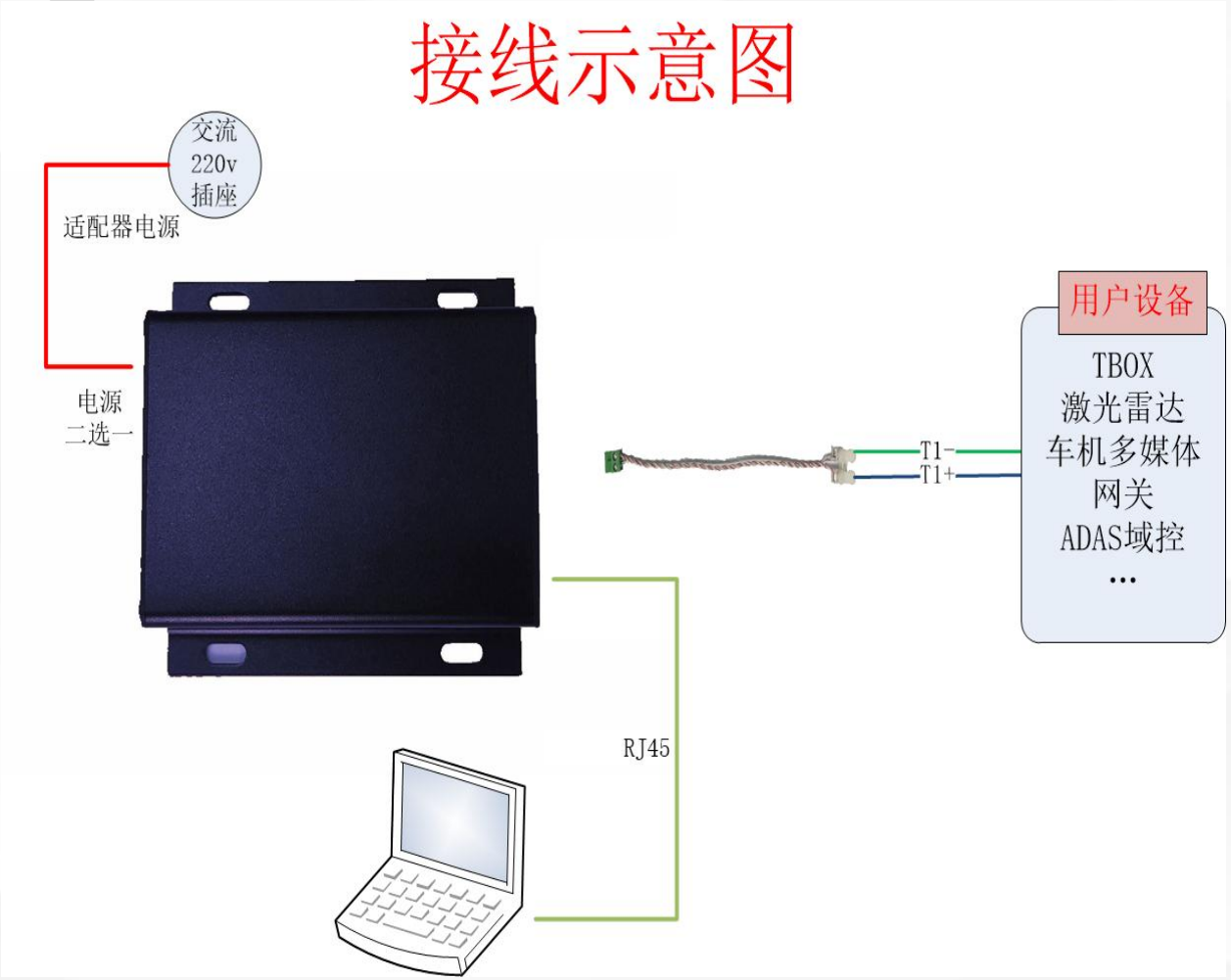
可切换主从模式，切换后无需复位或重启，立即生效

02 YD-1000BaseT1接口及框图介绍

技术参数		
产品说明	产品名称	车载以太网转换器
	产品型号	YD-100BaseT1
	传输速度	1000Mbits/sec
	主从模式	拨码开关切换，左从右主，可带电切换，立即生效
电源	供电电压	DC 9-36v
	功耗	＜2w
	接口	DC 11*9mm
	指示灯	Power红灯亮：供电正常
T1	IC	Ti DP83TG720
	接口	HT 5.08mm/2P 带转接头
	指示灯	Link绿灯亮：转换器与用户设备连接成功
Tx	IC	KSZ8041
	接口	RJ45 16*14mm 带指示灯
	指示灯	绿灯亮：设备连接成功，黄灯闪：数据传输
防护	电源保护	电源反接，过压，过流
	静电防护	±10kv接触放电
环境温度	工作温度	-20-75℃
	存储温度	-20-85℃
结构	材质	铝合金
	尺寸	84*85*25mm



02 YD-1000BaseT1使用说明介绍



1.按照左图方式连接设备
2.打开电源开关，电源红灯点亮
3.link绿灯点亮说明转换器与车载设备物理层链接成功
4.rj45网口灯点亮说明电脑与转换器物理层链接成功
5.待所有灯点亮后，电脑与车载设备IP设置为同一网段，用电脑ping车载设备，若ping通说明电脑与车载设备之间能正常收发数据
6.打开客户上位机进行用户测试

02 YD-1000BaseT1测试报告

1.电源测试-----纹波

Output Ripple Measurement

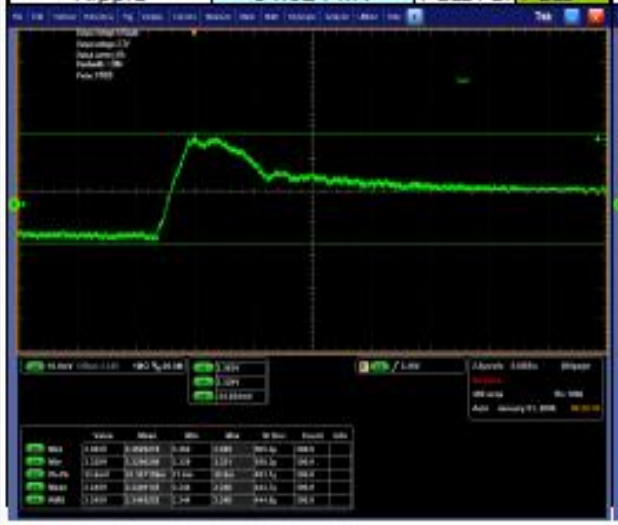
Test Condition:

1.The loading is setting to Imin or Imax at steady static.
2.adjusting voltage scale 10mV/div, and set offset to Vout, set time scale to 2~10us/div.
3.The measure need take bandwidth to 20BW and full BW
4.Put a 9x9 cm DC fan and the distance is about 5cm between board (regulator side)

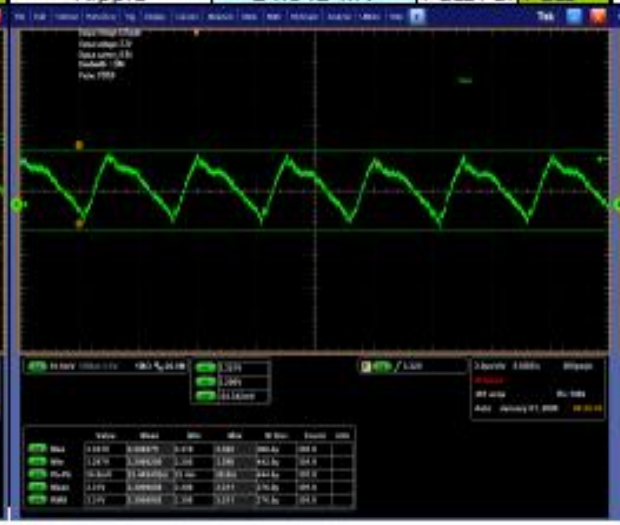
SPEC Description:

Input Voltage(V)			Output Voltage(V)			Output Current(A)			Ripple
Min	Typical	Max	Min	Typical	Max	Min	TDC	Max	Max
9 V	3.3 V	36 V	3.135 V	3.3 V	3.465 V	0 A	0.6 A	1.5 A	132 mV

Load Imin					
Time scale: 2us/div, 20MHz BW, Persistence off					
RMSmin	3.344 V	RMSmax	3.346 V	Pass/Fai	Pass
Ripple		34.024 mV		Pass/Fai	Pass



Load Imax					
Time scale: 2us/div, 20MHz BW, Persistence off					
RMSmin	3.309 V	RMSmax	3.311 V	Pass/Fai	Pass
Ripple		24.342 mV		Pass/Fai	Pass



Load Imin					
Time scale: 10us/div, 20MHz BW, Persistence off					
RMSmin	3.338 V	RMSmax	3.341 V	Pass/Fai	Pass
Ripple		33.734 mV		Pass/Fai	Pass

Load Imax					
Time scale: 10us/div, 20MHz BW, Persistence off					
RMSmin	3.308 V	RMSmax	3.311 V	Pass/Fai	Pass
Ripple		23.9 mV		Pass/Fai	Pass

02 YD-1000BaseT1测试报告

1.电源测试-----动态负载响应

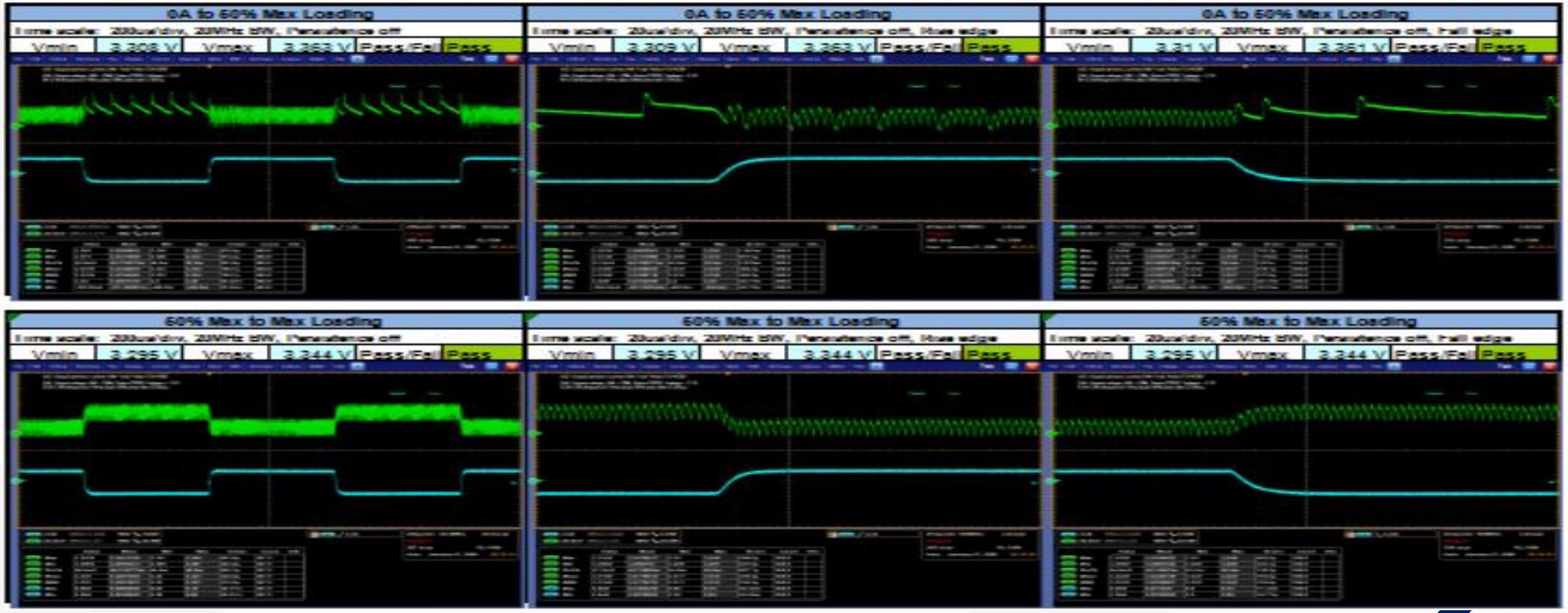
Dynamic Loading Measurement

Test Condition:

1.Dynamic current step1, 0A to 50% of Imax; Dynamic current step2, 50% of Imax to Imax.
2.Set the load sw-freq.=1kHz, duty=50%, slew rate= 2.5A/us.
3.The measure need take bandwidth to 20M BW
4.Put a 9x9 cm DC fan and the distance is about 5cm between board (regulator side)

SPEC Description:

Input Voltage			Output Voltage			Output Current		
Min	Typical	Max	Min	Typical	Max	Min	TDC	Max
9 V	3.3 V	36 V	3.135 V	3.3 V	3.465 V	0 A	0.6 A	1.5 A



02 YD-1000BaseT1测试报告

1.电源测试-----过流保护

Over current protection (OCP)

Test Condition:

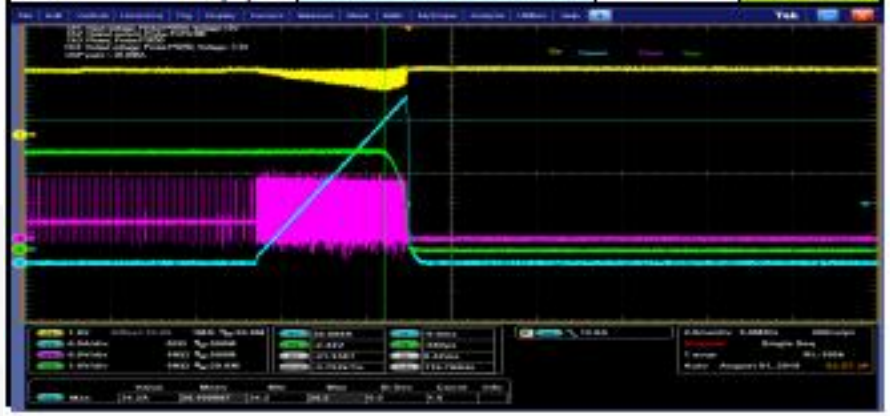
1.Take a >500 W power supply and remove OCP function of +12V to test OCP.
2.Use the tool of ADI's Interposer to adjust the loading.
3.Over current testing will be tested with using an external load set in "Constant Current" mode.
4.Measure the output current(Iout), Vcore,Phase and Vin waveform.

SPEC Description:

Input Voltage			OCP Point		
Min	Typical	Max	Min	Typical	Max
9V	24V	36V		1.5 A	

CH1	CH2	CH3	CH4
Vin	Current	Phase	Vout

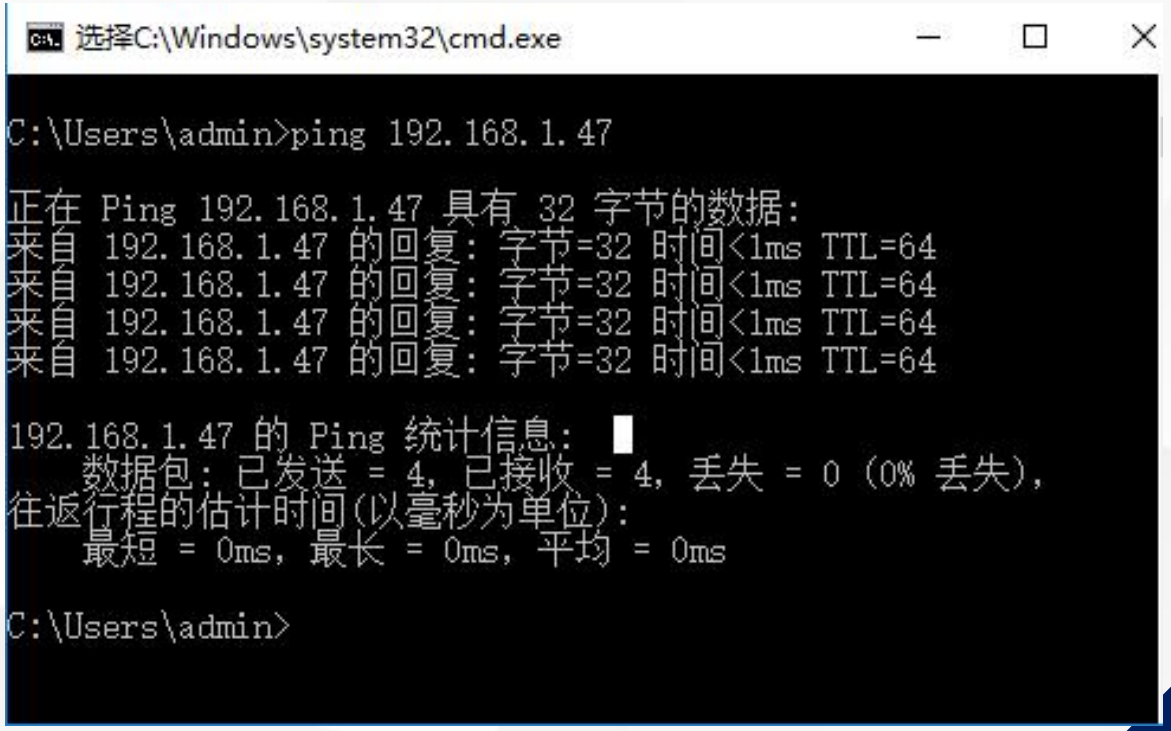
Time scale: 2ms/div, Full BW, Persistence off			
Test Value (A)	1.5	Pass/Fail	Pass



02 YD-1000BaseT1测试报告

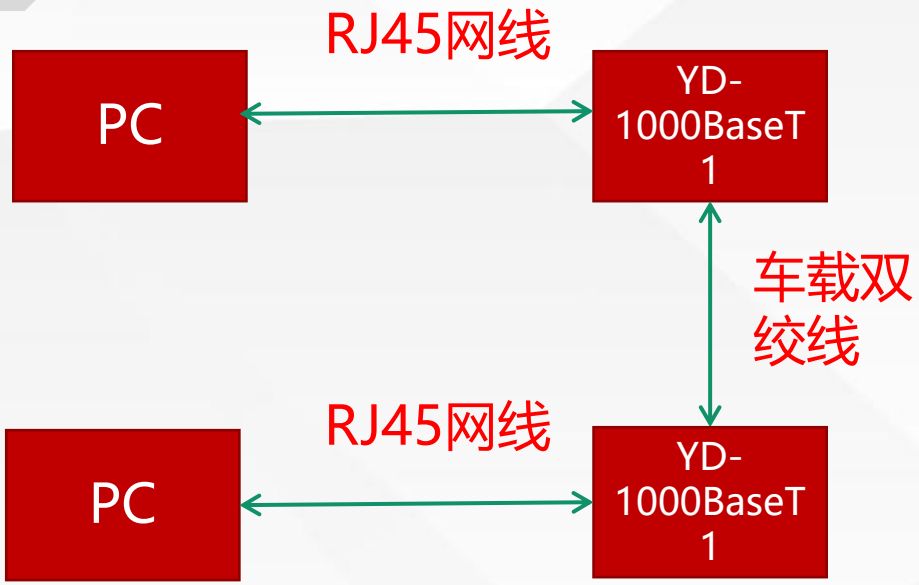
2.功能测试-----连通性测试

1.PC设置IP，必须要与被测设备是同一网段
2.PC启动doc窗口，输入ping指令，若能ping通说明整条链路连接成功



02 YD-1000BaseT1测试报告

2.功能测试-----传输带宽吞吐量测试




```
[root@networkserver app]# iperf3 -c 192.168.12.168
Connecting to host 192.168.12.168, port 5201
[  4] local 192.168.12.123 port 51628 connected to 192.168.12.168 port 5201
[ ID] Interval           Transfer     Bandwidth       Retransmits
[  4]   0.00-1.00   sec   111 MBytes   929 Mbits/sec    3
[  4]   1.00-2.00   sec   113 MBytes   944 Mbits/sec    0
[  4]   2.00-3.00   sec   112 MBytes   944 Mbits/sec    0
[  4]   3.00-4.00   sec   112 MBytes   941 Mbits/sec    0
[  4]   4.00-5.00   sec   112 MBytes   944 Mbits/sec    0
[  4]   5.00-6.00   sec   112 MBytes   943 Mbits/sec    0
[  4]   6.00-7.00   sec   112 MBytes   943 Mbits/sec    0
[  4]   7.00-8.00   sec   112 MBytes   944 Mbits/sec    8
[  4]   8.00-9.00   sec   112 MBytes   942 Mbits/sec    0
[  4]   9.00-10.00  sec   112 MBytes   937 Mbits/sec    0
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Retransmits
[  4]   0.00-10.00  sec  1.10 GBytes   941 Mbits/sec   11             sender
[  4]   0.00-10.00  sec  1.09 GBytes   940 Mbits/sec                  receiver

iperf Done.
```

1.按照上图链接方式进行测试
2.两个PC设置成同一网段
3.启动iperf就发送指令进行测试，传输带宽接近100Mbit/s

03 YD-1000/100BaseT1产品特点介绍（Marveel88q2112方案）

本产品用于车载两线以太网1000/100baseT1接口与标准以太网RJ45之间的物理层双向数据转换

采用市场主流芯片Marvell88Q2112设计,性能优良，抗干扰性好，可与TI,博通，marvell互连

铝合金外壳，散热性好，更结实耐用

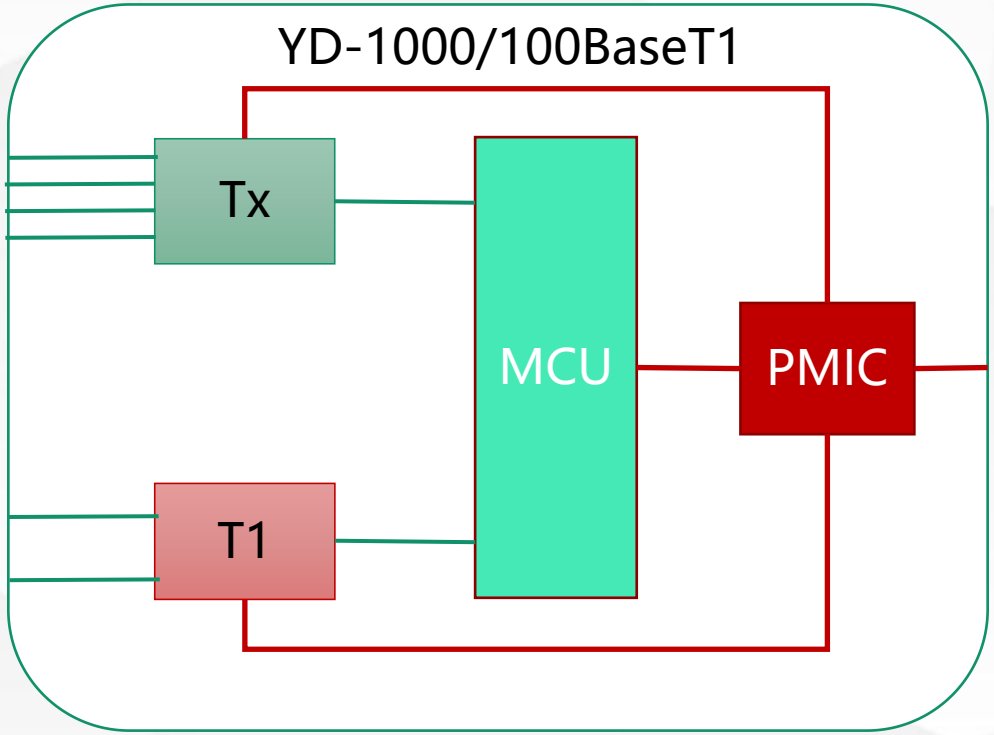
带状态指示灯：与车载ecu链接状态，电源状态，RJ45链接状态

宽电压范围输入：DC9-36V

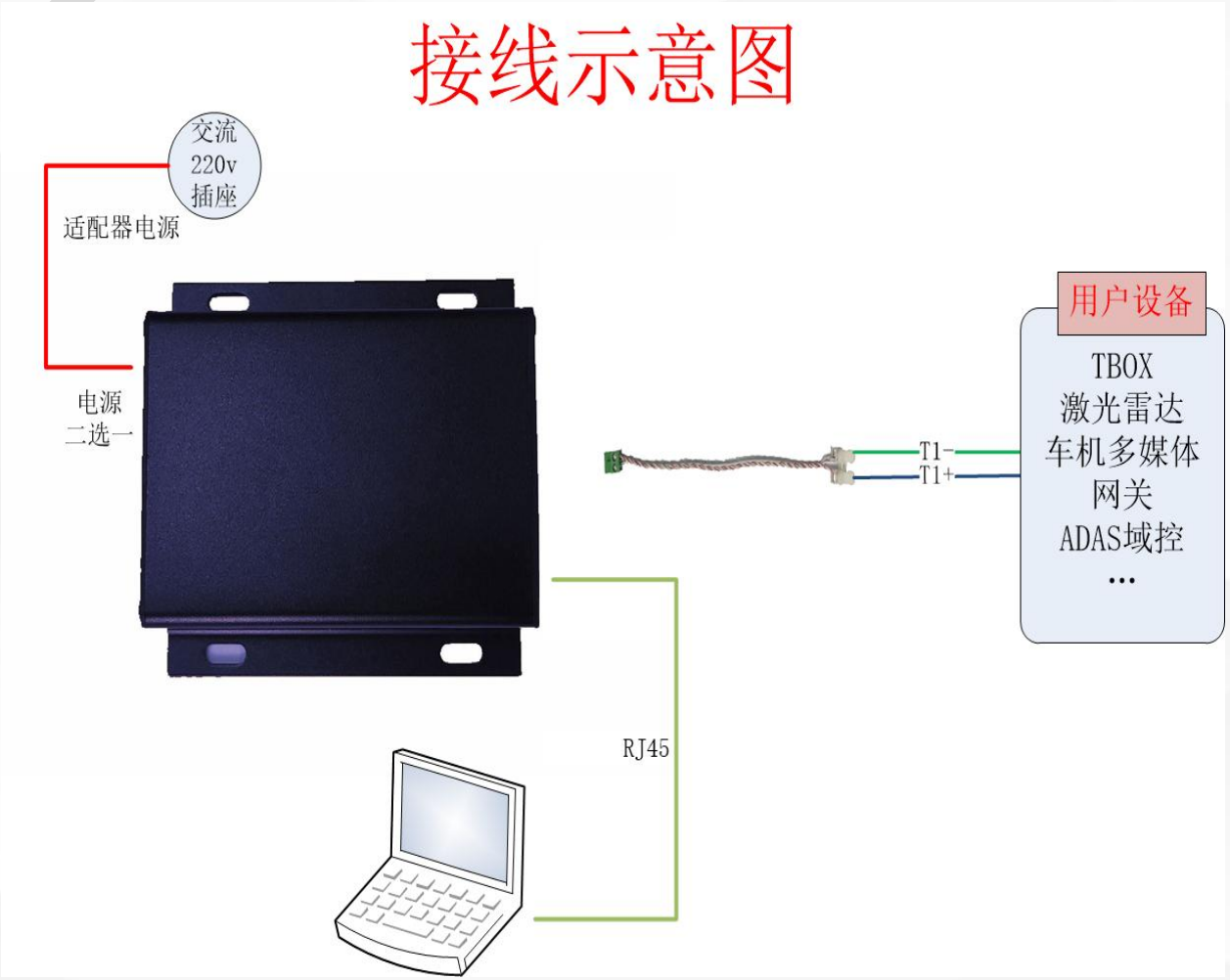
可切换主从模式和带宽，切换后无需复位或重启，立即生效

03 YD-1000/100BaseT1接口及框图介绍

技术参数		
产品说明	产品名称	车载以太网转换器
	产品型号	YD-100BaseT1
	传输速度	1000/100Mbits/sec
	主从模式	拨码开关切换，朝上从模式，朝下主模式，可带电切换，立即生效
	带宽选择	拨码开关切换，朝上1000M,朝下100M
电源	供电电压	DC 9-36v
	功耗	＜2w
	接口	DC 11*9mm
	指示灯	Power红灯亮：供电正常
T1	IC	Marvell88q2112
	接口	HT 5.08mm/2P 带转接头
	指示灯	Link绿灯亮：转换器与用户设备连接成功
Tx	IC	KSZ8041
	接口	RJ45 16*14mm 带指示灯
	指示灯	绿灯亮：设备连接成功，黄灯闪：数据传输
防护	电源保护	电源反接，过压，过流
	静电防护	±10kv接触放电
环境温度	工作温度	-20-75℃
	存储温度	-20-85℃
结构	材质	铝合金
	尺寸	84*85*25mm



03 YD-1000/100BaseT1使用说明介绍



1.按照左图方式连接设备
2.打开电源开关，电源红灯点亮
3.link绿灯点亮说明转换器与车载设备物理层链接成功
4.rj45网口灯点亮说明电脑与转换器物理层链接成功
5.待所有灯点亮后，电脑与车载设备IP设置为同一网段，用电脑ping车载设备，若ping通说明电脑与车载设备之间能正常收发数据
6.打开客户上位机进行用户测试

03 YD-1000/100BaseT1测试报告

1.电源测试-----纹波

Output Ripple Measurement

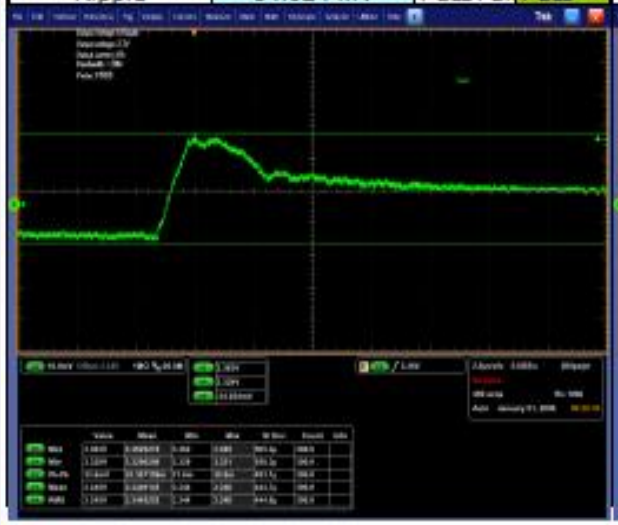
Test Condition:

1.The loading is setting to Imin or Imax at steady static.
2.adjusting voltage scale 10mV/div, and set offset to Vout, set time scale to 2~10us/div.
3.The measure need take bandwidth to 20BW and full BW
4.Put a 9x9 cm DC fan and the distance is about 5cm between board (regulator side)

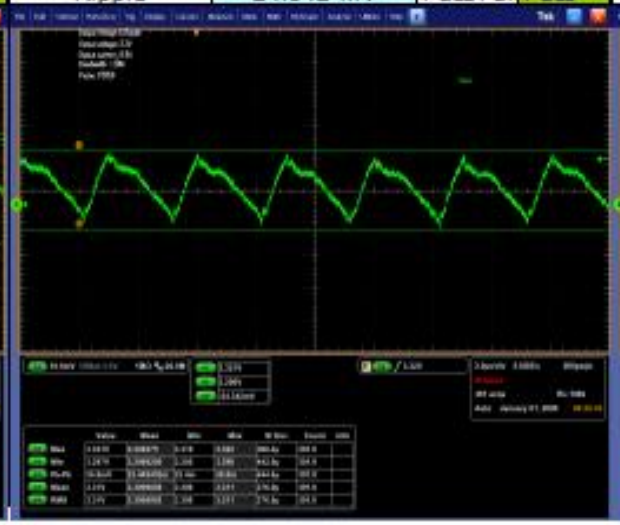
SPEC Description:

Input Voltage(V)			Output Voltage(V)			Output Current(A)			Ripple
Min	Typical	Max	Min	Typical	Max	Min	TDC	Max	Max
9 V	3.3 V	36 V	3.135 V	3.3 V	3.465 V	0 A	0.6 A	1.5 A	132 mV

Load Imin					
Time scale: 2us/div, 20MHz BW, Persistence off					
RMSmin	3.344 V	RMSmax	3.346 V	Pass/Fai	Pass
Ripple		34.024 mV		Pass/Fai	Pass



Load Imax					
Time scale: 2us/div, 20MHz BW, Persistence off					
RMSmin	3.309 V	RMSmax	3.311 V	Pass/Fai	Pass
Ripple		24.342 mV		Pass/Fai	Pass



Load Imin					
Time scale: 10us/div, 20MHz BW, Persistence off					
RMSmin	3.338 V	RMSmax	3.341 V	Pass/Fai	Pass
Ripple		33.734 mV		Pass/Fai	Pass

Load Imax					
Time scale: 10us/div, 20MHz BW, Persistence off					
RMSmin	3.308 V	RMSmax	3.311 V	Pass/Fai	Pass
Ripple		23.9 mV		Pass/Fai	Pass

03 YD-1000/100BaseT1测试报告

1.电源测试-----动态负载响应

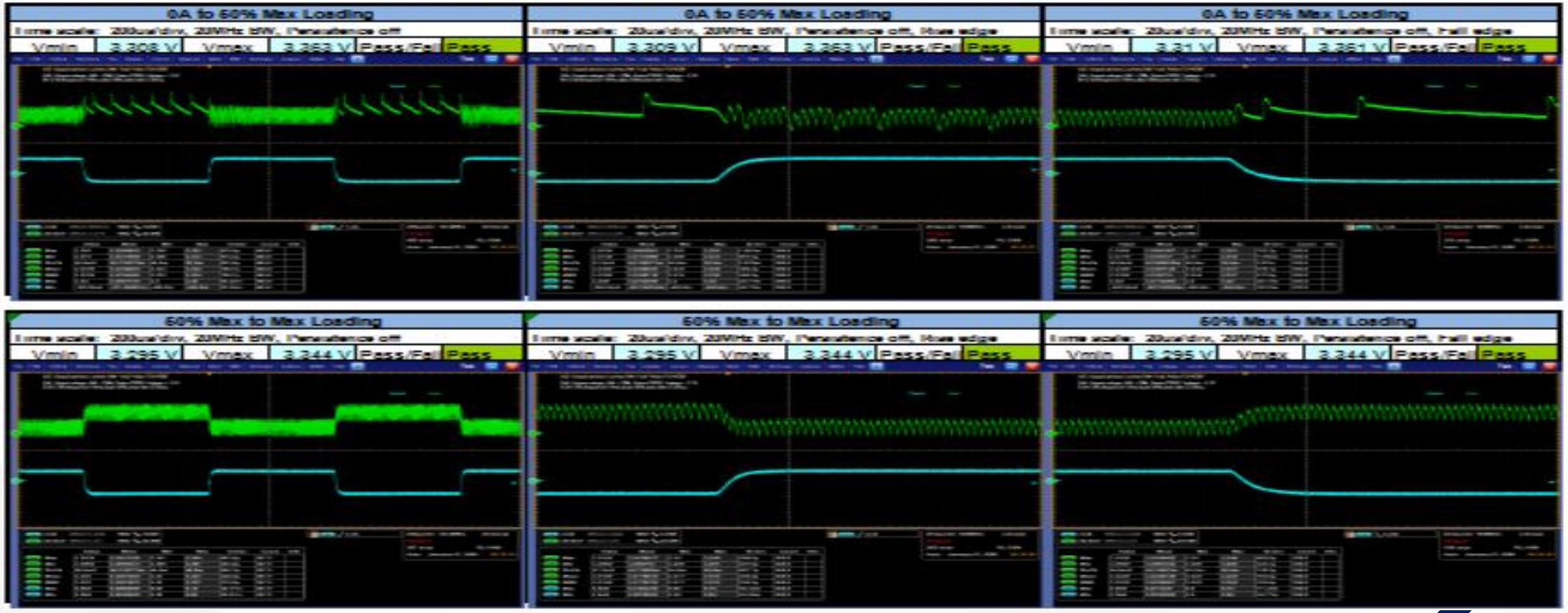
Dynamic Loading Measurement

Test Condition:

1.Dynamic current step1, 0A to 50% of Imax; Dynamic current step2, 50% of Imax to Imax.
2.Set the load sw-freq.=1kHz, duty=50%, slew rate= 2.5A/us.
3.The measure need take bandwidth to 20M BW
4.Put a 9x9 cm DC fan and the distance is about 5cm between board (regulator side)

SPEC Description:

Input Voltage			Output Voltage			Output Current		
Min	Typical	Max	Min	Typical	Max	Min	TDC	Max
9 V	3.3 V	36 V	3.135 V	3.3 V	3.465 V	0 A	0.6 A	1.5 A



02 YD-1000/100BaseT1测试报告

1.电源测试-----过流保护

Over current protection (OCP)

Test Condition:

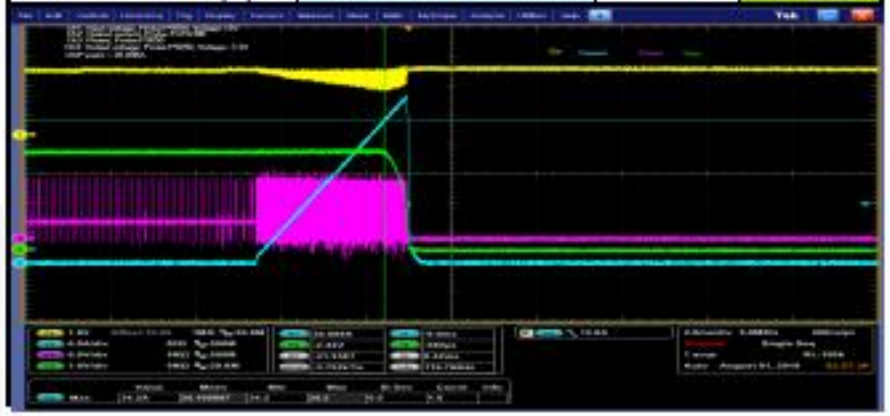
1.Take a >500 W power supply and remove OCP function of +12V to test OCP.
2.Use the tool of ADI's Interposer to adjust the loading.
3.Over current testing will be tested with using an external load set in "Constant Current" mode.
4.Measure the output current(Iout), Vcore,Phase and Vin waveform.

SPEC Description:

Input Voltage			OCP Point		
Min	Typical	Max	Min	Typical	Max
9V	24V	36V		1.5 A	

CH1	CH2	CH3	CH4
Vin	Current	Phase	Vout

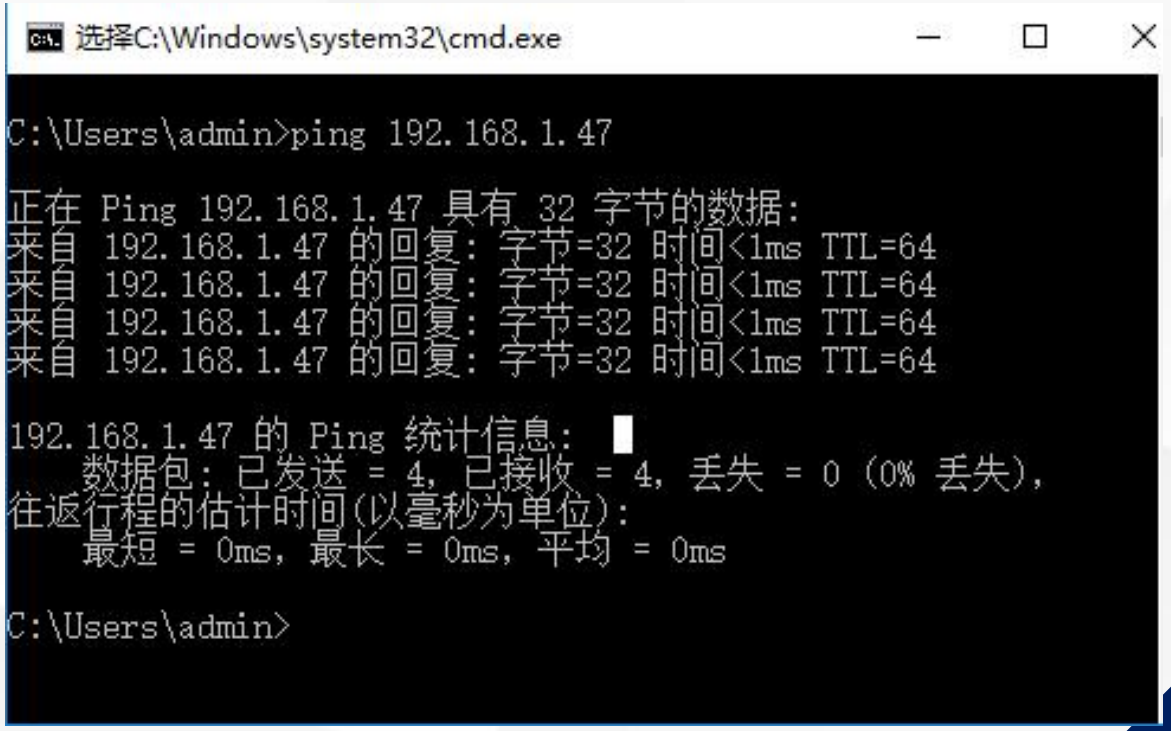
Time scale: 2ms/div, Full BW, Persistence off			
Test Value (A)	1.5	Pass/Fail	Pass



03 YD-1000/100BaseT1测试报告

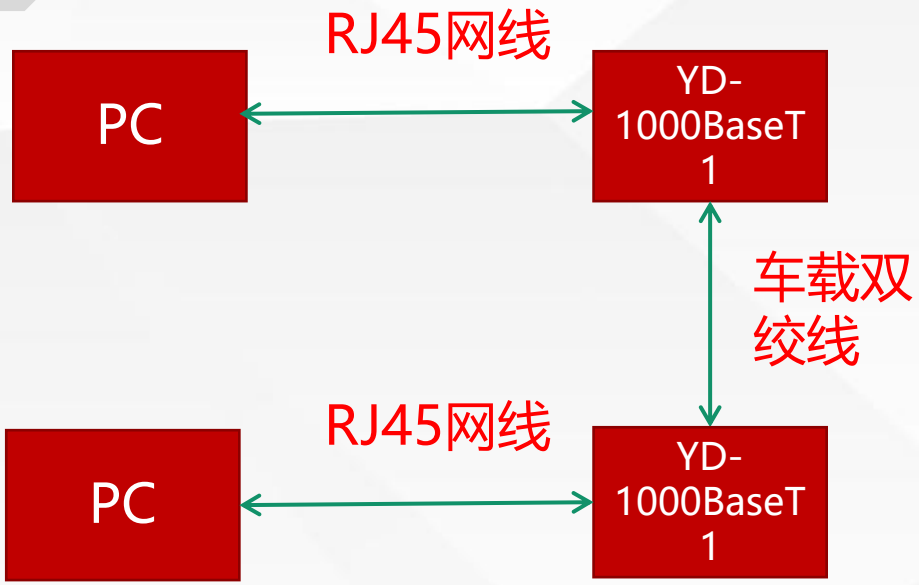
2.功能测试-----连通性测试

1.PC设置IP，必须要与被测设备是同一网段
2.PC启动doc窗口，输入ping指令，若能ping通说明整条链路连接成功



03 YD-1000/100BaseT1测试报告

2.功能测试-----传输带宽吞吐量测试




```
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[  4] local 192.168.12.123 port 51628 connected to 192.168.12.168 port 5201
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[  4]   7.00-8.00   sec   112 MBytes   944 Mbits/sec    8
[  4]   8.00-9.00   sec   112 MBytes   942 Mbits/sec    0
[  4]   9.00-10.00  sec   112 MBytes   937 Mbits/sec    0
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Retransmits
[  4]   0.00-10.00  sec  1.10 GBytes   941 Mbits/sec   11             sender
[  4]   0.00-10.00  sec  1.09 GBytes   940 Mbits/sec                  receiver

iperf Done.
```

1.按照上图链接方式进行测试
2.两个PC设置成同一网段
3.启动iperf就发送指令进行测试，传输带宽接近100Mbit/s