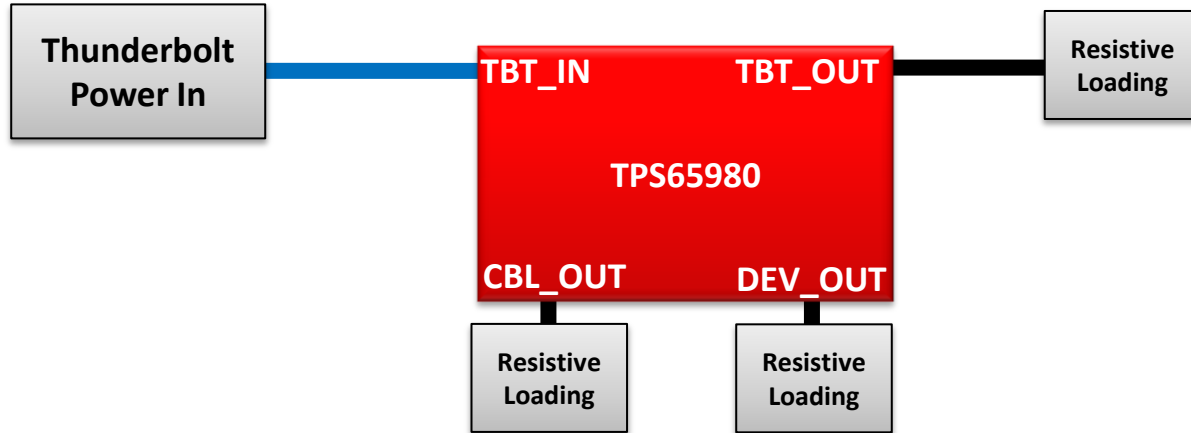


# TPS65980

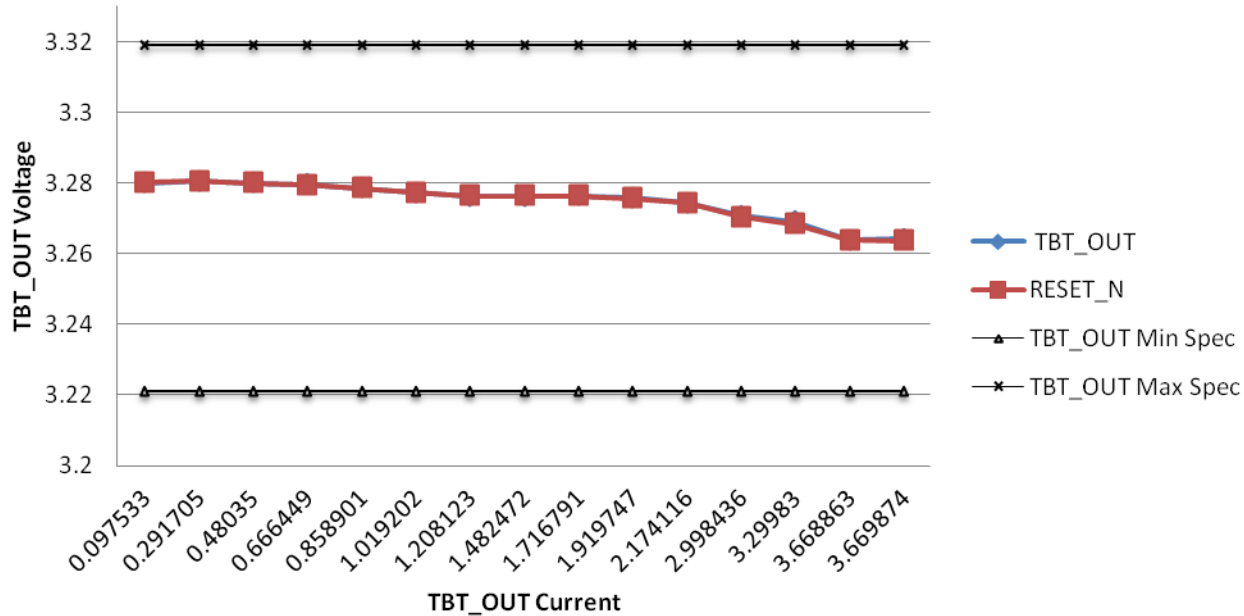
## System Testing – Power Loading & Sequencing

# TPS65980 System Power Loading Testing Setup



# TBT\_OUT Load Testing

## DUT19: TBT\_OUT vs TBT\_OUT Current

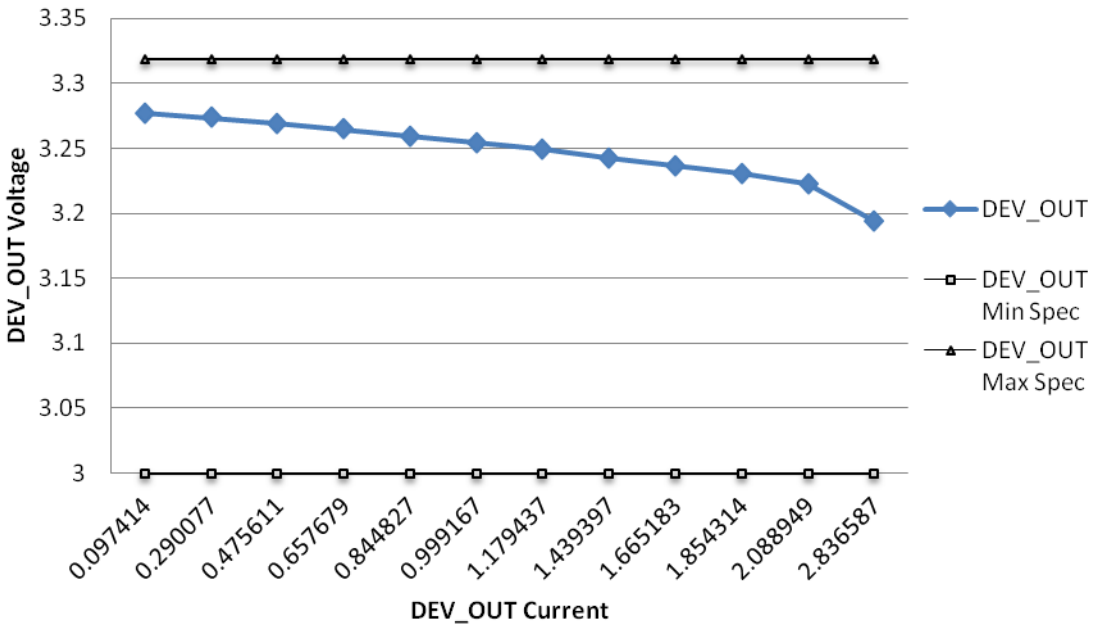


- **TBT\_OUT = 3.26V @ 3.67A**

| TBT_OUT Current (I) | TBT_OUT (V) | CBL_OUT (V) | DEV_OUT (V) | RESET_N (V) |
|---------------------|-------------|-------------|-------------|-------------|
| 0.098               | 3.280       | 3.280       | 3.280       | 3.280       |
| 0.292               | 3.280       | 3.281       | 3.280       | 3.281       |
| 0.480               | 3.280       | 3.280       | 3.280       | 3.280       |
| 0.666               | 3.280       | 3.280       | 3.280       | 3.280       |
| 0.859               | 3.279       | 3.279       | 3.279       | 3.279       |
| 1.019               | 3.277       | 3.277       | 3.277       | 3.277       |
| 1.208               | 3.276       | 3.276       | 3.276       | 3.276       |
| 1.482               | 3.276       | 3.276       | 3.276       | 3.276       |
| 1.717               | 3.276       | 3.276       | 3.276       | 3.276       |
| 1.920               | 3.276       | 3.276       | 3.276       | 3.276       |
| 2.174               | 3.274       | 3.274       | 3.274       | 3.274       |
| 2.998               | 3.271       | 3.271       | 3.271       | 3.271       |
| 3.300               | 3.269       | 3.270       | 3.269       | 3.268       |
| 3.669               | 3.264       | 3.264       | 3.263       | 3.264       |

# DEV\_OUT Load Testing

## DEV\_OUT vs DEV\_OUT Current

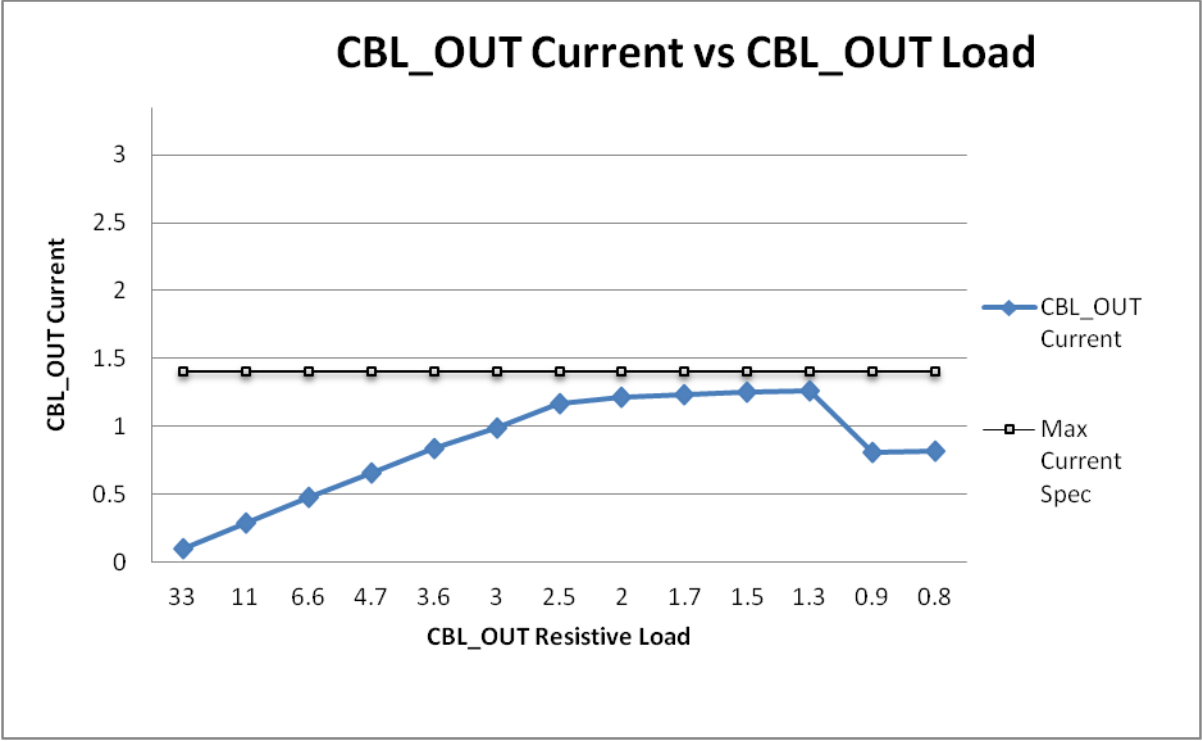


- DEV\_OUT = 3.19V @ 2.83A

| DEV_OUT Current (I) | TBT_OUT (V) | CBL_OUT (V) | DEV_OUT (V) | RESET_N (V) |
|---------------------|-------------|-------------|-------------|-------------|
| 0.097               | 3.279       | 3.279       | 3.277       | 3.279       |
| 0.290               | 3.279       | 3.278       | 3.274       | 3.278       |
| 0.476               | 3.278       | 3.276       | 3.269       | 3.277       |
| 0.658               | 3.278       | 3.275       | 3.265       | 3.275       |
| 0.845               | 3.277       | 3.273       | 3.260       | 3.273       |
| 0.999               | 3.275       | 3.270       | 3.255       | 3.271       |
| 1.179               | 3.274       | 3.268       | 3.249       | 3.269       |
| 1.439               | 3.273       | 3.266       | 3.243       | 3.267       |
| 1.665               | 3.273       | 3.265       | 3.237       | 3.266       |
| 1.854               | 3.272       | 3.263       | 3.231       | 3.264       |
| 2.089               | 3.270       | 3.260       | 3.223       | 3.261       |
| 2.837               | 3.265       | 3.249       | 3.194       | 3.252       |

# CBL\_OUT Load Current Limit Testing

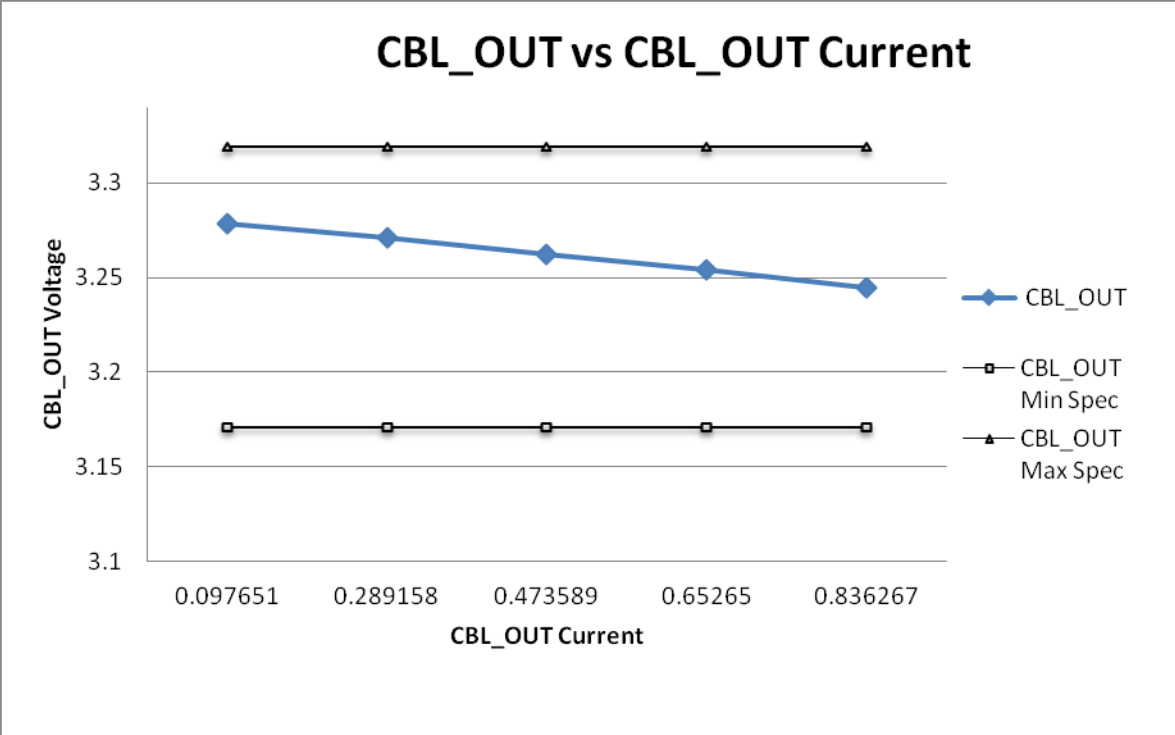
CBL\_OUT Current vs CBL\_OUT Load



- Max ICBL\_OUT = 1.258A

| Resistive Load | CBL_OUT Current | CBL_OUT |
|----------------|-----------------|---------|
| 33             | 0.097           | 3.276   |
| 11             | 0.289           | 3.268   |
| 6.6            | 0.473           | 3.260   |
| 4.7            | 0.653           | 3.251   |
| 3.6            | 0.837           | 3.242   |
| 3              | 0.988           | 3.234   |
| 2.5            | 1.164           | 3.224   |
| 2              | 1.211           | 2.765   |
| 1.7            | 1.239           | 2.444   |
| 1.5            | 1.255           | 2.218   |
| 1.3            | 1.258           | 1.967   |
| 0.9            | 0.807           | 0.932   |
| 0.8            | 0.097           | 3.276   |

# CBL\_OUT Load Testing



- CBL\_OUT = 3.24V @ 837mA

| CBL_OUT Current | TBT_OUT | CBL_OUT | DEV_OUT | RESET_N |
|-----------------|---------|---------|---------|---------|
| 0.097           | 3.280   | 3.276   | 3.279   | 3.279   |
| 0.289           | 3.280   | 3.268   | 3.279   | 3.279   |
| 0.473           | 3.279   | 3.260   | 3.277   | 3.278   |
| 0.653           | 3.278   | 3.251   | 3.276   | 3.276   |
| 0.837           | 3.277   | 3.242   | 3.274   | 3.274   |

# System Power Sequencing

# TPS65980 Start Up (TBT\_IN 0 → 2.5V)



**Thunderbolt Input Power**  
**Thunderbolt Main Supply**  
**Thunderbolt Controller Reset**



# TPS65980 LV → HV Mode (3.3V to 6.5V)



**Thunderbolt Input Power**  
**Thunderbolt Cable Supply**  
**Thunderbolt Control Signal**

# TPS65980 LV→HV Mode DEV\_OUT



**Thunderbolt Control Signal**  
**Thunderbolt Support Supply**  
**Thunderbolt Control Signal**

# TPS65980 DEV\_OUT Control (DEV\_ENz)



**Thunderbolt Control Signal**  
**Thunderbolt Support Supply**

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