Reduced Power Spinup™ (RPS™)

WD Scorpio™ ML40 Optimized Spinup Feature

External & Consumer Electronics (CE) Applications

The external 2.5-inch hard drive market is a growing segment in the storage industry. Many providers of external 2.5-inch drives are powering them from just one Universal Serial Bus (USB) port. To provide this capability, the external drive must minimize the amount of current consumed for spinup. Consumer Electronic (CE) applications are also utilizing 2.5-inch drives. Since many of these applications are portable in nature, the electronics as well as the drive require an internal battery source, which in turn will likely limit the drive's spinup current.

The Challenge

2.5-inch drives are primarily utilized in notebook systems. To provide the fast spinup preferred in these systems, the drive can consume approximately 1A of power which does not lend itself to the external hard drive market.

To address both the external 2.5-inch drive marketplace requirements as well as the notebook marketplace requirements, WD has created the capability to configure its 2.5-inch drives to spin up using minimal power consumption (see Figure 1). By implementing this feature, external hard drives integrating WD drives will have a greater range of compatibility with the various systems and cables in the marketplace.

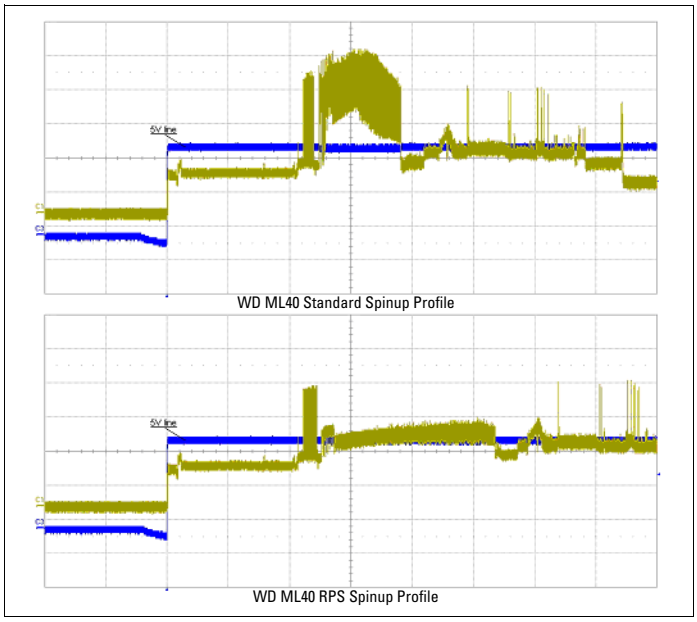

Figure 1. WD Scorpio ML40 Standard vs. RPS ML40 Spinup

How to Enable RPS Mode

Implementation of RPS requires a jumper to be added to the 4-pin jumper block on the WD Scorpio ML40 hard drive. The jumper settings in Figure 2 below configure the drive to always spin up in RPS mode. For the system design configuration (see Figure 2 below), pins A-B (Slave) or D-B (Cable Select) must be grounded by pins in the system, not by jumpers.

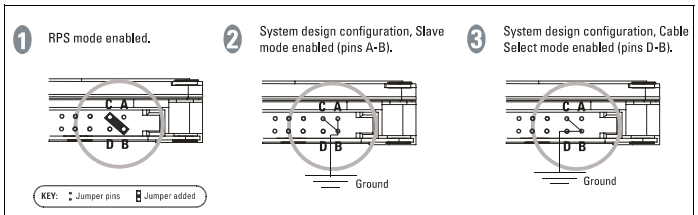

Figure 2. RPS Jumper Settings

A Significant Improvement in Spinup Performance

Specific focus for RPS was to minimize the duration and magnitude of the peak power consumption from the hard drive.

Metrics	Standard	RPS Mode
Start to "Drive Ready" (seconds)[1]	4.5	5.05
Spinup current (mA)	900	850
Duration at peak spinup current (ms)	800 [2]	125 [2]

[1] Average numbers under nominal power and temperature.

[2] Approximate.

Table 1. Default vs. RPS Spinup Current Profile

Conclusion

Reduced Power Spinup (RPS) mode is WD's optimized spinup feature specifically designed for the external hard drive and CE market.

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