timing derating

Operating temperature, operating voltage, and device processing conditions, along with product revision and speed grade, account for variations in array timing characteristics. These variations are summarized in derating factors for TPC10 array typical timing specifications. The derating factors as shown in Table 4 are based on the recommended operating conditions for TPC10 commercial, industrial, and military applications.

For estimating performance, the delay factors may be used in conjunction with the delay values shown in the typical switching characteristics tables. Temperature and voltage variations are measured according to the curves in the graphs shown in Figure 6 and Figure 7. The ALS timing analyzer can be used to provide actual postlayout timing specifications for each circuit implementation.

Table 4. Timing Derating Factor (x typical) (see Note 9)

TPC1010A, TPC1020A TPC1010B, TPC1020B	C SUFFIX		I SUFFIX		M SUFFIX	
	BEST CASE	WORST CASE	BEST CASE	WORST CASE	BEST CASE	WORST CASE
Standard speed	0.45	1.54	0.40	1.65	0.37	1.79
–1 Speed grade	0.45	1.28	0.40	1.37	0.37	1.49
–2 Speed grade†	0.45	1.13	0.40	1.20	0.37	1.32

† Applies to TPC1010B and TPC1020B only

NOTE 9: Best case reflects maximum operating voltage, minimum operating temperature, and best case processing. Worst case reflects minimum operating voltage, maximum operating temperature, and worst case processing. Best case derating is based on sample data only and is not guaranteed.

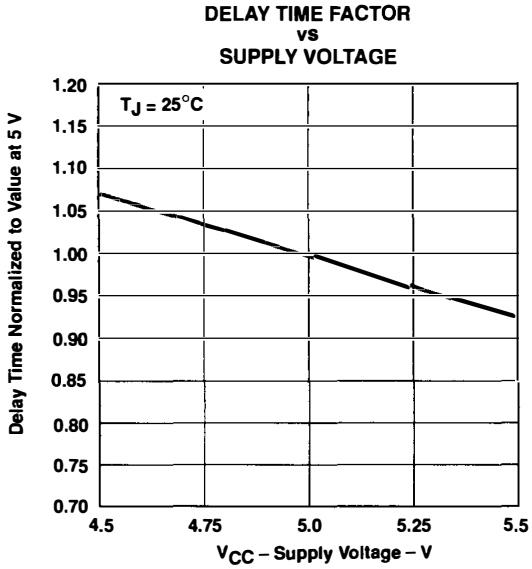


Figure 6

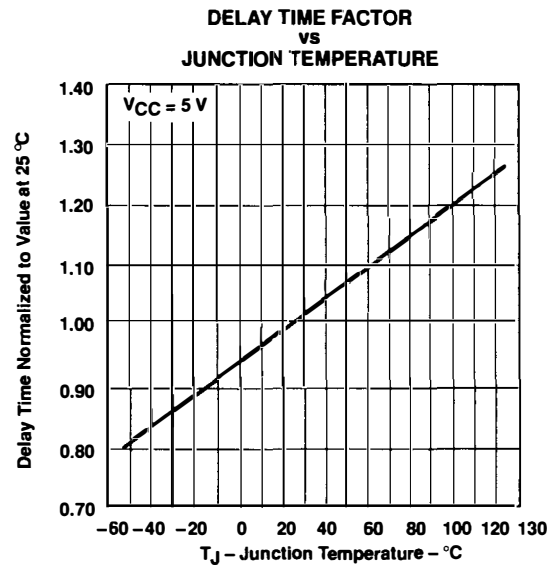
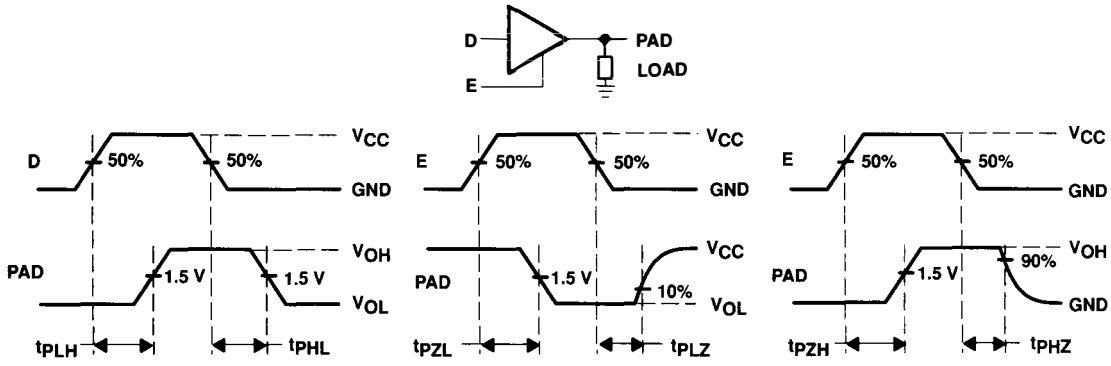


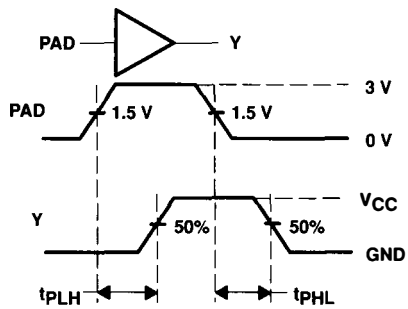
Figure 7

	LMV344IPWR/TSSOP	23480	新环保批次	TSSOP
	CC2541F256RHAR	23480	新环保批次	VQFN-40
	54HCT240	23480	新环保批次	
	54HCT238F3A	23480	新环保批次	
	54HCT238	23480	新环保批次	CDIP
	54HCT244	23480	新环保批次	CDIP
	54HCT273F	23480	新环保批次	
	54HCT244/BCAJC=54HCT	23480	新环保批次	DIP
	54HCT244/BCAJC	23480	新环保批次	
	CC2541EMK	23480	新环保批次	-
	54HCT244/BRAJC	23480	新环保批次	CDIP20
	BQ24100RHLR(p/b)	23480	新环保批次	VQFN-20
	CC2541DK-RC	23480	新环保批次	
	CC2541DK	23480	新环保批次	
	CC2541CRHA	23480	新环保批次	
	BQ27200EVM	23480	新环保批次	
	0PA4353EA/2K5	23480	新环保批次	New
	BD746A	23480	新环保批次	TO-3P
	BQ25116AYFPR	23480	新环保批次	SMD
	BQ20Z704	23480	新环保批次	TSSOP20
	MSA282PWR	23480	新环保批次	TSSOP16
	MSA282PW	23480	新环保批次	TSSOP16
	BQ25700	23480	新环保批次	QFN
	430F110	23480	新环保批次	SSOP-20
	BQ25150YFPT	23480	新环保批次	DSBGA-20
	BQ25600CYFFT	23480	新环保批次	DSBGA-30
	BQ25713BRSNR	23480	新环保批次	QFN-32
	BQ29310PWRG4	23480	新环保批次	TSSOP-24
	BQ2002ESNG4	23480	新环保批次	NA
	BQ2204	23480	新环保批次	
	BQ29311	23480	新环保批次	TSSOP24
	BQ29310	23480	新环保批次	TSSOP24

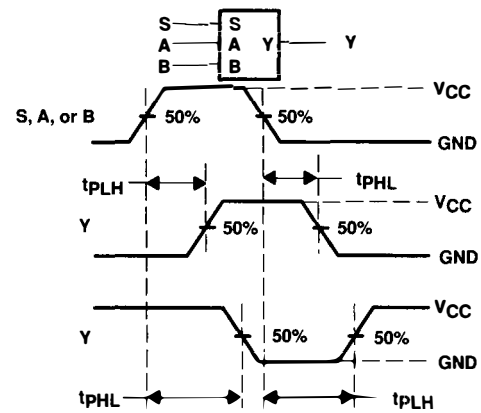
PARAMETER MEASUREMENT INFORMATION



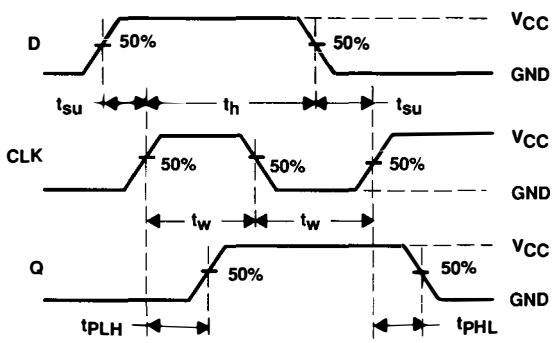
OUTPUT BUFFER DELAYS

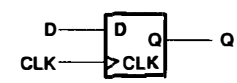


INPUT BUFFER DELAYS



MODULE DELAYS





D FLIP-FLOP SHOWING POSITIVE-EDGE TRIGGERED CLOCK

Figure 8. Symbols, Test Loads, and Voltage Waveforms

	BQ25116AYFPR	23480	新环保批次	SMD
	BQ20Z704	23480	新环保批次	TSSOP20
	MSA282PWR	23480	新环保批次	TSSOP16
	MSA282PW	23480	新环保批次	TSSOP16
	BQ25700	23480	新环保批次	QFN
	430F110	23480	新环保批次	SSOP-20
	BQ25150YFPT	23480	新环保批次	DSBGA-20
	BQ25600CYFFT	23480	新环保批次	DSBGA-30
	BQ25713BRSNR	23480	新环保批次	QFN-32
	BQ29310PWRG4	23480	新环保批次	TSSOP-24
	BQ2002ESNG4	23480	新环保批次	NA
	BQ2204	23480	新环保批次	
	BQ29311	23480	新环保批次	TSSOP24
	BQ29310	23480	新环保批次	TSSOP24
	BQ25713RSNR	23480	新环保批次	
	BQ20Z451DBTR-R7-CF	23480	新环保批次	
	BQ24803DR	23480	新环保批次	QFN
	BQ20Z95DBTR pb-FREE	23480	新环保批次	
	BQ29410DCTR pb-FREE	23480	新环保批次	
	BQ20895DBTR pb-FREE	23480	新环保批次	
	BQ29412DCTR pb-FREE	23480	新环保批次	
	BQ2060A-E619DBQR pb-FF	23480	新环保批次	
	BQ25872	23480	新环保批次	BGA
	BQ25601RTWP	23480	新环保批次	QFN
	BQ2024LPRE3	23480	新环保批次	TO-92
	BQ20Z75DBTRV160	23480	新环保批次	
	BQ2050HSN-A510	23480	新环保批次	SOP-16
	BQ2050HSN-A510TRG4	23480	新环保批次	SOP-16
	BQ2570XA	23480	新环保批次	QFN
	OES	23480	新环保批次	QFN
	TMM2068D-35	23480	新环保批次	DIP20
	TPA23100D2PHPR	23480	新环保批次	QFP-48