

# 4-BIT BINARY COUNTER

# MTTL MC5400/7400 Series Complex Functions

## MC5493L\* MC7493L,P\*

TRUTH TABLE

Connect A to C2

| COUNT | OUTPUT |   |   |   |
|-------|--------|---|---|---|
|       | D      | C | B | A |
| 0     | 0      | 0 | 0 | 0 |
| 1     | 0      | 0 | 0 | 1 |
| 2     | 0      | 0 | 1 | 0 |
| 3     | 0      | 0 | 1 | 1 |
| 4     | 0      | 1 | 0 | 0 |
| 5     | 0      | 1 | 0 | 1 |
| 6     | 0      | 1 | 1 | 0 |
| 7     | 0      | 1 | 1 | 1 |
| 8     | 1      | 0 | 0 | 0 |
| 9     | 1      | 0 | 0 | 1 |
| 10    | 1      | 0 | 1 | 0 |
| 11    | 1      | 0 | 1 | 1 |
| 12    | 1      | 1 | 0 | 0 |
| 13    | 1      | 1 | 0 | 1 |
| 14    | 1      | 1 | 1 | 0 |
| 15    | 1      | 1 | 1 | 1 |

Input Loading Factor

R0 = 1

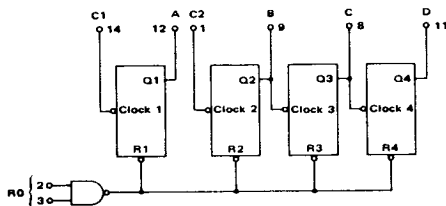
C1, C2 = 2

Output Loading Factor = 10

Total Power Dissipation = 180 mW typ/pkg

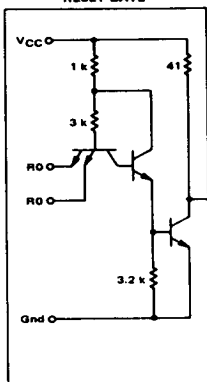
Propagation Delay Time = 20 ns typ/bit

This 4-bit counter is comprised of two sections: a divide-by-two section and a divide-by-eight section. These sections can be used independently, or can be connected to provide the divide-by-16 function. All outputs of the counter can be set to the logic "0" state by applying a logic "1" level to the Reset input.

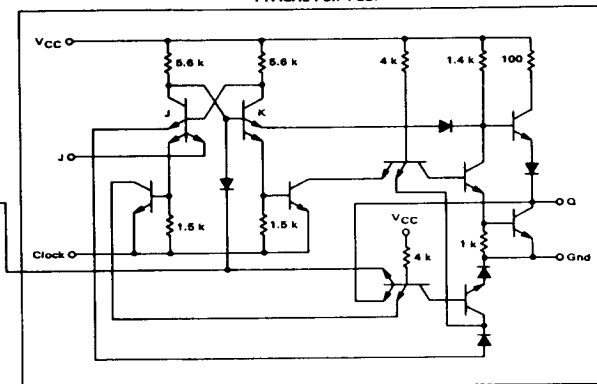


VCC = PIN 5  
GND = PIN 10

RESET GATE



TYPICAL FLIP-FLOP



\*L suffix = TO-116 ceramic dual in-line package (Case 632).  
\*P suffix = TO-116 ceramic dual in-line package (Case 606).

# MC5493L, MC7493L, P (continued)

## ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one input of the reset gate. The other input is tested in the same manner.

| Characteristic | Symbol | Pin Under Test | MC5493 Test Limits<br>-55 to +125 °C |     |      |     | MC7493 Test Limits<br>0 to +70 °C |      |     |     | TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW: |          |          |          |          |          |          |          |          |          |           |           | Pulse     |           | Grd |           |           |           |           |           |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |    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|                |        |                | Min                                  | Max | Unit | Min | Max                               | Unit | Min | Max | Unit                                                 | $I_{OL}$ | $V_{OL}$ | $V_{IH}$ | $V_{OH}$ | $V_{IN}$ | $V_{TH}$ | $V_{IL}$ | $V_{IH}$ | $V_{OH}$ | $V_{CC1}$ | $V_{CC2}$ | $V_{CC3}$ | $V_{CC4}$ |     | $V_{CC5}$ | $V_{CC6}$ | $V_{CC7}$ | $V_{CC8}$ | $V_{CC9}$ | $V_{CC10}$ | $V_{CC11}$ | $V_{CC12}$ | $V_{CC13}$ | $V_{CC14}$ | $V_{CC15}$ | $V_{CC16}$ | $V_{CC17}$ | $V_{CC18}$ | $V_{CC19}$ | $V_{CC20}$ | $V_{CC21}$ | $V_{CC22}$ | $V_{CC23}$ | $V_{CC24}$ | $V_{CC25}$ | $V_{CC26}$ | $V_{CC27}$ | $V_{CC28}$ | $V_{CC29}$ | $V_{CC30}$ | $V_{CC31}$ | $V_{CC32}$ | $V_{CC33}$ | $V_{CC34}$ | $V_{CC35}$ | $V_{CC36}$ | $V_{CC37}$ | $V_{CC38}$ | $V_{CC39}$ | $V_{CC40}$ | $V_{CC41}$ | $V_{CC42}$ | $V_{CC43}$ | $V_{CC44}$ | $V_{CC45}$ | $V_{CC46}$ | $V_{CC47}$ | $V_{CC48}$ | $V_{CC49}$ | $V_{CC50}$ | $V_{CC51}$ | $V_{CC52}$ | $V_{CC53}$ | $V_{CC54}$ | $V_{CC55}$ | $V_{CC56}$ | $V_{CC57}$ | $V_{CC58}$ | $V_{CC59}$ | $V_{CC60}$ | $V_{CC61}$ | $V_{CC62}$ | $V_{CC63}$ | $V_{CC64}$ | $V_{CC65}$ | $V_{CC66}$ | $V_{CC67}$ | $V_{CC68}$ | $V_{CC69}$ | $V_{CC70}$ | $V_{CC71}$ | $V_{CC72}$ | $V_{CC73}$ | $V_{CC74}$ | $V_{CC75}$ | $V_{CC76}$ | $V_{CC77}$ | $V_{CC78}$ | $V_{CC79}$ | $V_{CC80}$ | $V_{CC81}$ | $V_{CC82}$ | $V_{CC83}$ | $V_{CC84}$ | $V_{CC85}$ | $V_{CC86}$ | $V_{CC87}$ | $V_{CC88}$ | $V_{CC89}$ | $V_{CC90}$ | $V_{CC91}$ | $V_{CC92}$ | $V_{CC93}$ | $V_{CC94}$ | $V_{CC95}$ | $V_{CC96}$ | $V_{CC97}$ | $V_{CC98}$ | $V_{CC99}$ | $V_{CC100}$ | $V_{CC101}$ | $V_{CC102}$ | $V_{CC103}$ | $V_{CC104}$ | $V_{CC105}$ | $V_{CC106}$ | $V_{CC107}$ | $V_{CC108}$ | $V_{CC109}$ | $V_{CC110}$ | $V_{CC111}$ | $V_{CC112}$ | $V_{CC113}$ | $V_{CC114}$ | $V_{CC115}$ | $V_{CC116}$ | $V_{CC117}$ | $V_{CC118}$ | $V_{CC119}$ | $V_{CC120}$ | $V_{CC121}$ | $V_{CC122}$ | $V_{CC123}$ | $V_{CC124}$ | $V_{CC125}$ | $V_{CC126}$ | $V_{CC127}$ | $V_{CC128}$ | $V_{CC129}$ | $V_{CC130}$ | $V_{CC131}$ | $V_{CC132}$ | $V_{CC133}$ | $V_{CC134}$ | $V_{CC135}$ | $V_{CC136}$ | $V_{CC137}$ | $V_{CC138}$ | $V_{CC139}$ | $V_{CC140}$ | $V_{CC141}$ | $V_{CC142}$ | $V_{CC143}$ | $V_{CC144}$ | $V_{CC145}$ | $V_{CC146}$ | $V_{CC147}$ | $V_{CC148}$ | $V_{CC149}$ | $V_{CC150}$ | $V_{CC151}$ | $V_{CC152}$ | $V_{CC153}$ | $V_{CC154}$ | $V_{CC155}$ | $V_{CC156}$ | $V_{CC157}$ | $V_{CC158}$ | $V_{CC159}$ | $V_{CC160}$ | $V_{CC161}$ | $V_{CC162}$ | $V_{CC163}$ | $V_{CC164}$ | $V_{CC165}$ | $V_{CC166}$ | $V_{CC167}$ | $V_{CC168}$ | $V_{CC169}$ | $V_{CC170}$ | $V_{CC171}$ | $V_{CC172}$ | $V_{CC173}$ | $V_{CC174}$ | $V_{CC175}$ | $V_{CC176}$ | $V_{CC177}$ | $V_{CC178}$ | $V_{CC179}$ | $V_{CC180}$ | $V_{CC181}$ | $V_{CC182}$ | $V_{CC183}$ | $V_{CC184}$ | $V_{CC185}$ | $V_{CC186}$ | $V_{CC187}$ | $V_{CC188}$ | $V_{CC189}$ | $V_{CC190}$ | $V_{CC191}$ | $V_{CC192}$ | $V_{CC193}$ | $V_{CC194}$ | $V_{CC195}$ | $V_{CC196}$ | $V_{CC197}$ | $V_{CC198}$ | $V_{CC199}$ | $V_{CC200}$ | $V_{CC201}$ | $V_{CC202}$ | $V_{CC203}$ | $V_{CC204}$ | $V_{CC205}$ | $V_{CC206}$ | $V_{CC207}$ | $V_{CC208}$ | $V_{CC209}$ | $V_{CC210}$ | $V_{CC211}$ | $V_{CC212}$ | $V_{CC213}$ | $V_{CC214}$ | $V_{CC215}$ | $V_{CC216}$ | $V_{CC217}$ | $V_{CC218}$ | $V_{CC219}$ | $V_{CC220}$ | $V_{CC221}$ | $V_{CC222}$ | $V_{CC223}$ | $V_{CC224}$ | $V_{CC225}$ | $V_{CC226}$ | $V_{CC227}$ | $V_{CC228}$ | $V_{CC229}$ | $V_{CC230}$ | $V_{CC231}$ | $V_{CC232}$ | $V_{CC233}$ | $V_{CC234}$ | $V_{CC235}$ | $V_{CC236}$ | $V_{CC237}$ | $V_{CC238}$ | $V_{CC239}$ | $V_{CC240}$ | $V_{CC241}$ | $V_{CC242}$ | $V_{CC243}$ | $V_{CC244}$ | $V_{CC245}$ | $V_{CC246}$ | $V_{CC247}$ | $V_{CC248}$ | $V_{CC249}$ | $V_{CC250}$ | $V_{CC251}$ | $V_{CC252}$ | $V_{CC253}$ | $V_{CC254}$ | $V_{CC255}$ | $V_{CC256}$ | $V_{CC257}$ | $V_{CC258}$ | $V_{CC259}$ | $V_{CC260}$ | $V_{CC261}$ | $V_{CC262}$ | $V_{CC263}$ | $V_{CC264}$ | $V_{CC265}$ | $V_{CC266}$ | $V_{CC267}$ | $V_{CC268}$ | $V_{CC269}$ | $V_{CC270}$ | $V_{CC271}$ | $V_{CC272}$ | $V_{CC273}$ | $V_{CC274}$ | $V_{CC275}$ | $V_{CC276}$ | $V_{CC277}$ | $V_{CC278}$ | $V_{CC279}$ | $V_{CC280}$ | $V_{CC281}$ | $V_{CC282}$ | $V_{CC283}$ | $V_{CC284}$ | $V_{CC285}$ | $V_{CC286}$ | $V_{CC287}$ | $V_{CC288}$ | $V_{CC289}$ | $V_{CC290}$ | $V_{CC291}$ | $V_{CC292}$ | $V_{CC293}$ | $V_{CC294}$ | $V_{CC295}$ | $V_{CC296}$ | $V_{CC297}$ | $V_{CC298}$ | $V_{CC299}$ | $V_{CC300}$ | $V_{CC301}$ | $V_{CC302}$ | $V_{CC303}$ | $V_{CC304}$ | $V_{CC305}$ | $V_{CC306}$ | $V_{CC307}$ | $V_{CC308}$ | $V_{CC309}$ | $V_{CC310}$ | $V_{CC311}$ | $V_{CC312}$ | $V_{CC313}$ | $V_{CC314}$ | $V_{CC315}$ | $V_{CC316}$ | $V_{CC317}$ | $V_{CC318}$ | $V_{CC319}$ | $V_{CC320}$ | $V_{CC321}$ | $V_{CC322}$ | $V_{CC323}$ | $V_{CC324}$ | $V_{CC325}$ | $V_{CC326}$ | $V_{CC327}$ | $V_{CC328}$ | $V_{CC329}$ | $V_{CC330}$ | $V_{CC331}$ | $V_{CC332}$ | $V_{CC333}$ | $V_{CC334}$ | $V_{CC335}$ | $V_{CC336}$ | $V_{CC337}$ | $V_{CC338}$ | $V_{CC339}$ | $V_{CC340}$ | $V_{CC341}$ | $V_{CC342}$ | $V_{CC343}$ | $V_{CC344}$ | $V_{CC345}$ | $V_{CC346}$ | $V_{CC347}$ | $V_{CC348}$ | $V_{CC349}$ | $V_{CC350}$ | $V_{CC351}$ | $V_{CC352}$ | $V_{CC353}$ | $V_{CC354}$ | $V_{CC355}$ | $V_{CC356}$ | $V_{CC357}$ | $V_{CC358}$ | $V_{CC359}$ | $V_{CC360}$ | $V_{CC361}$ | $V_{CC362}$ | $V_{CC363}$ | $V_{CC364}$ | $V_{CC365}$ | $V_{CC366}$ | $V_{CC367}$ | $V_{CC368}$ | $V_{CC369}$ | $V_{CC370}$ | $V_{CC371}$ | $V_{CC372}$ | $V_{CC373}$ | $V_{CC374}$ | $V_{CC375}$ | $V_{CC376}$ | $V_{CC377}$ | $V_{CC378}$ | $V_{CC379}$ | $V_{CC380}$ | $V_{CC381}$ | $V_{CC382}$ | $V_{CC383}$ | $V_{CC384}$ | $V_{CC385}$ | $V_{CC386}$ | $V_{CC387}$ | $V_{CC388}$ | $V_{CC389}$ | $V_{CC390}$ | $V_{CC391}$ | $V_{CC392}$ | $V_{CC393}$ | $V_{CC394}$ | $V_{CC395}$ | $V_{CC396}$ | $V_{CC397}$ | $V_{CC398}$ | $V_{CC399}$ | $V_{CC400}$ | $V_{CC401}$ | $V_{CC402}$ | $V_{CC403}$ | $V_{CC404}$ | $V_{CC405}$ | $V_{CC406}$ | $V_{CC407}$ | $V_{CC408}$ | $V_{CC409}$ | $V_{CC410}$ | $V_{CC411}$ | $V_{CC412}$ | $V_{CC413}$ | $V_{CC414}$ | $V_{CC415}$ | $V_{CC416}$ | $V_{CC417}$ | $V_{CC418}$ | $V_{CC419}$ | $V_{CC420}$ | $V_{CC421}$ | $V_{CC422}$ | $V_{CC423}$ | $V_{CC424}$ | $V_{CC425}$ | $V_{CC426}$ | $V_{CC427}$ | $V_{CC428}$ | $V_{CC429}$ | $V_{CC430}$ | $V_{CC431}$ | $V_{CC432}$ | $V_{CC433}$ | $V_{CC434}$ | $V_{CC435}$ | $V_{CC436}$ | $V_{CC437}$ | $V_{CC438}$ | $V_{CC439}$ | $V_{CC440}$ | $V_{CC441}$ | $V_{CC442}$ | $V_{CC443}$ | $V_{CC444}$ | $V_{CC445}$ | $V_{CC446}$ | $V_{CC447}$ | $V_{CC448}$ | $V_{CC449}$ | $V_{CC450}$ | $V_{CC451}$ | $V_{CC452}$ | $V_{CC453}$ | $V_{CC454}$ | $V_{CC455}$ | $V_{CC456}$ | $V_{CC457}$ | $V_{CC458}$ | $V_{CC459}$ | $V_{CC460}$ | $V_{CC461}$ | $V_{CC462}$ | $V_{CC463}$ | $V_{CC464}$ | $V_{CC465}$ | $V_{CC466}$ | $V_{CC467}$ | $V_{CC468}$ | $V_{CC469}$ | $V_{CC470}$ | $V_{CC471}$ | $V_{CC472}$ | $V_{CC473}$ | $V_{CC474}$ | $V_{CC475}$ | $V_{CC476}$ | $V_{CC477}$ | $V_{CC478}$ | $V_{CC479}$ | $V_{CC480}$ | $V_{CC481}$ | $V_{CC482}$ | $V_{CC483}$ | $V_{CC484}$ | $V_{CC485}$ | $V_{CC486}$ | $V_{CC487}$ | $V_{CC488}$ | $V_{CC489}$ | $V_{CC490}$ | $V_{CC491}$ | $V_{CC492}$ | $V_{CC493}$ | $V_{CC494}$ | $V_{CC495}$ | $V_{CC496}$ | $V_{CC497}$ | $V_{CC498}$ | $V_{CC499}$ | $V_{CC500}$ | $V_{CC501}$ | $V_{CC502}$ | $V_{CC503}$ | $V_{CC504}$ | $V_{CC505}$ | $V_{CC506}$ | $V_{CC507}$ | $V_{CC508}$ | $V_{CC509}$ | $V_{CC510}$ | $V_{CC511}$ | $V_{CC512}$ | $V_{CC513}$ | $V_{CC514}$ | $V_{CC515}$ | $V_{CC516}$ | $V_{CC517}$ | $V_{CC518}$ | $V_{CC519}$ | $V_{CC520}$ | $V_{CC521}$ | $V_{CC522}$ | $V_{CC523}$ | $V_{CC524}$ | $V_{CC525}$ | $V_{CC526}$ | $V_{CC527}$ | $V_{CC528}$ | $V_{CC529}$ | $V_{CC530}$ | $V_{CC531}$ | $V_{CC532}$ | $V_{CC533}$ | $V_{CC534}$ | $V_{CC535}$ | $V_{CC536}$ | $V_{CC537}$ | $V_{CC538}$ | $V_{CC539}$ | $V_{CC540}$ | $V_{CC541}$ | $V_{CC542}$ | $V_{CC543}$ | $V_{CC544}$ | $V_{CC545}$ | $V_{CC546}$ | $V_{CC547}$ | $V_{CC548}$ | $V_{CC549}$ | $V_{CC550}$ | $V_{CC551}$ | $V_{CC552}$ | $V_{CC553}$ | $V_{CC554}$ | $V_{CC555}$ | $V_{CC556}$ | $V_{CC557}$ | $V_{CC558}$ | $V_{CC559}$ | $V_{CC560}$ | $V_{CC561}$ | $V_{CC562}$ | $V_{CC563}$ | $V_{CC564}$ | $V_{CC565}$ | $V_{CC566}$ | $V_{CC567}$ | $V_{CC568}$ | $V_{CC569}$ | $V_{CC570}$ | $V_{CC571}$ | $V_{CC572}$ | $V_{CC573}$ | $V_{CC574}$ | $V_{CC575}$ | $V_{CC576}$ | $V_{CC577}$ | $V_{CC578}$ | $V_{CC579}$ | $V_{CC580}$ | $V_{CC581}$ | $V_{CC582}$ | $V_{CC583}$ | $V_{CC584}$ | $V_{CC585}$ | $V_{CC586}$ | $V_{CC587}$ | $V_{CC588}$ | $V_{CC589}$ | $V_{CC590}$ | $V_{CC591}$ | $V_{CC592}$ | $V_{CC593}$ | $V_{CC594}$ | $V_{CC595}$ | $V_{CC596}$ | $V_{CC597}$ | $V_{CC598}$ | $V_{CC599}$ | $V_{CC600}$ | $V_{CC601}$ | $V_{CC602}$ | $V_{CC603}$ | $V_{CC604}$ | $V_{CC605}$ | $V_{CC606}$ | $V_{CC607}$ | $V_{CC608}$ | $V_{CC609}$ | $V_{CC610}$ | $V_{CC611}$ | $V_{CC612}$ | $V_{CC613}$ | $V_{CC614}$ | $V_{CC615}$ | $V_{CC616}$ | $V_{CC617}$ | $V_{CC618}$ | $V_{CC619}$ | $V_{CC620}$ | $V_{CC621}$ | $V_{CC622}$ | $V_{CC623}$ | $V_{CC624}$ | $V_{CC625}$ | $V_{CC626}$ | $V_{CC627}$ | $V_{CC628}$ | $V_{CC629}$ | $V_{CC630}$ | $V_{CC631}$ | $V_{CC632}$ | $V_{CC633}$ | $V_{CC634}$ | $V_{CC635}$ | $V_{CC636}$ | $V_{CC637}$ | $V_{CC638}$ | $V_{CC639}$ | $V_{CC640}$ | $V_{CC641}$ | $V_{CC642}$ | $V_{CC643}$ | $V_{CC644}$ | $V_{CC645}$ | $V_{CC646}$ | $V_{CC647}$ | $V_{CC648}$ | $V_{CC649}$ | $V_{CC650}$ | $V_{CC651}$ | $V_{CC652}$ | $V_{CC653}$ | $V_{CC654}$ | $V_{CC655}$ | $V_{CC656}$ | $V_{CC657}$ | $V_{CC658}$ | $V_{CC659}$ | $V_{CC660}$ | $V_{CC661}$ | $V_{CC662}$ | $V_{CC663}$ | $V_{CC664}$ | $V_{CC665}$ | $V_{CC666}$ | $V_{CC667}$ | $V_{CC668}$ | $V_{CC669}$ | $V_{CC670}$ | $V_{CC671}$ | $V_{CC672}$ | $V_{CC673}$ | $V_{CC674}$ | $V_{CC675}$ | $V_{CC676}$ | $V_{CC677}$ | $V_{CC678}$ | $V_{CC679}$ | $V_{CC680}$ | $V_{CC681}$ | $V_{CC682}$ | $V_{CC683}$ | $V_{CC684}$ | $V_{CC685}$ | $V_{CC686}$ | $V_{CC687}$ | $V_{CC688}$ | $V_{CC689}$ | $V_{CC690}$ | $V_{CC691}$ | $V_{CC692}$ | $V_{CC693}$ | $V_{CC694}$ | $V_{CC695}$ | $V_{CC696}$ | $V_{CC697}$ | $V_{CC698}$ | $V_{CC699}$ | $V_{CC700}$ | $V_{CC701}$ | $V_{CC702}$ | $V_{CC703}$ | $V_{CC704}$ | $V_{CC705}$ | $V_{CC706}$ | $V_{CC707}$ | $V_{CC708}$ | $V_{CC709}$ | $V_{CC710}$ | $V_{CC711}$ | $V_{CC712}$ | $V_{CC713}$ | $V_{CC714}$ | $V_{CC715}$ | $V_{CC716}$ | $V_{CC717}$ | $V_{CC718}$ | $V_{CC719}$ | $V_{CC720}$ | $V_{CC721}$ | $V_{CC722}$ | $V_{CC723}$ | $V_{CC724}$ | $V_{CC725}$ | $V_{CC726}$ | $V_{CC727}$ | $V_{CC728}$ | $V_{CC729}$ | $V_{CC730}$ | $V_{CC731}$ | $V_{CC732}$ | $V_{CC733}$ | $V_{CC734}$ | $V_{CC735}$ | $V_{CC736}$ | $V_{CC737}$ | $V_{CC738}$ | $V_{CC739}$ | $V_{CC740}$ | $V_{CC741}$ | $V_{CC742}$ | $V_{CC743}$ | $V_{CC744}$ | $V_{CC745}$ | $V_{CC746}$ | $V_{CC747}$ | $V_{CC748}$ | $V_{CC749}$ | $V_{CC750}$ | $V_{CC751}$ | $V_{CC752}$ | $V_{CC753}$ | $V_{CC754}$ | $V_{CC755}$ | $V_{CC756}$ | $V_{CC757}$ | $V_{CC758}$ | $V_{CC759}$ | $V_{CC760}$ | $V_{CC761}$ | $V_{CC762}$ | $V_{CC763}$ | $V_{CC764}$ | $V_{CC765}$ | $V_{CC766}$ | $V_{CC767}$ | $V_{CC768}$ | $V_{CC769}$ | $V_{CC770}$ | $V_{CC771}$ | $V_{CC772}$ | $V_{CC773}$ | $V_{CC774}$ | $V_{CC775}$ | $V_{CC776}$ | $V_{CC777}$ | $V_{CC778}$ | $V_{CC779}$ | $V_{CC780}$ | $V_{CC781}$ | $V_{CC782}$ | $V_{CC783}$ | $V_{CC784}$ | $V_{CC785}$ | $V_{CC786}$ | $V_{CC787}$ | $V_{CC788}$ | $V_{CC789}$ | $V_{CC790}$ | $V_{CC791}$ | $V_{CC792}$ | $V_{CC793}$ | $V_{CC794}$ | $V_{CC795}$ | $V_{CC796}$ | $V_{CC797}$ | $V_{CC798}$ | $V_{CC799}$ | $V_{CC800}$ | $V_{CC801}$ | $V_{CC802}$ | $V_{CC803}$ | $V_{CC804}$ | $V_{CC805}$ | $V_{CC806}$ | $V_{CC807}$ | $V_{CC808}$ | $V_{CC809}$ | $V_{CC810}$ | $V_{CC811}$ | $V_{CC812}$ | $V_{CC813}$ | $V_{CC814}$ | $V_{CC815}$ | $V_{CC816}$ | $V_{CC817}$ | $V_{CC818}$ | $V_{CC819}$ | $V_{CC820}$ | $V_{CC821}$ | $V_{CC822}$ | $V_{CC823}$ | $V_{CC824}$ | $V_{CC825}$ | $V_{CC826}$ | $V_{CC827}$ | $V_{CC828}$ | $V_{CC829}$ | $V_{CC830}$ | $V_{CC831}$ | $V_{CC832}$ | $V_{CC833}$ | $V_{CC834}$ | $V_{CC835}$ | $V_{CC836}$ | $V_{CC837}$ | $V_{CC838}$ | $V_{CC839}$ | $V_{CC840}$ | $V_{CC841}$ | $V_{CC842}$ | $V_{CC843}$ | $V_{CC844}$ | $V_{CC845}$ | $V_{CC846}$ | $V_{CC847}$ | $V_{CC848}$ | $V_{CC849}$ | $V_{CC850}$ | $V_{CC851}$ | $V_{CC852}$ | $V_{CC853}$ | $V_{CC854}$ | $V_{CC855}$ | $V_{CC856}$ | $V_{CC857}$ | $V_{CC858}$ | $V_{CC859}$ | $V_{CC860}$ | $V_{CC861}$ | $V_{CC862}$ | $V_{CC863}$ | $V_{CC864}$ | $V_{CC865}$ | $V_{CC866}$ | $V_{CC867}$ | $V_{CC868}$ | $V_{CC869}$ | $V_{CC870}$ | $V_{CC871}$ | $V_{CC872}$ |

Pulse 1: Momentarily apply  $V_{th1}$  then  $V_{th0}$  prior to taking measurement to set the device in the desired state.

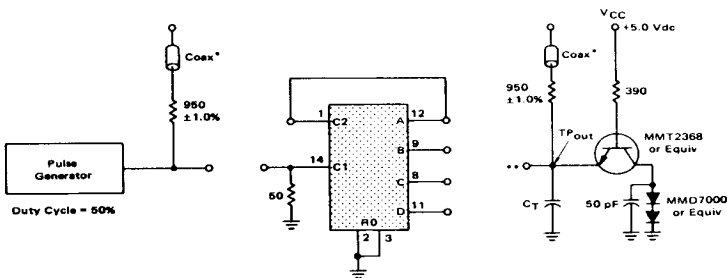
Maintain  $V_{th0}$  voltage for measurement.

Pulse 2: Apply positive pulse prior to taking measurement to set the device in the desired state.

Maintain  $V_{th1}$  voltage for measurement.

① All input, power supply and ground voltages must be maintained between each test unless otherwise noted.

### SWITCHING TIME TEST CIRCUIT

 $t_{Tog} = 10 \text{ MHz min}$ 

$C_T = 15 \text{ pF}$  = total parasitic capacitance, which includes probe, wiring, and load capacitances.

\*The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.

\*A load is connected to each output during the test.

### VOLTAGE WAVEFORMS AND DEFINITIONS

