Nov. 24, 2008

R121 added and value of R120 increased to move TRACK pin above 700mV in normal operation.

U101 thru U401 must have address pin currents properly trimmed, parts delivered Nov. 2009 did not

Switching losses
5Vin, 5.1A, 5kHzc = 191mW
ratio cond. losses = 119mW
or total U101 losses = 310mW

Q102 cond. losses: 50mW max
gate drive losses = 16.5mW

With resistor values shown:

PMBus address for this channel will be 24 decimal or 38 octal if ALT_PMbus_ADDR is open and 33 decimal or 49 octal if ALT_PMbus_ADDR is grounded

Vompu=Vin/V6
hence, PMBus = 6

R116 updated in test to reduce overshoot: Nov. 23

For U101: TPS40400RHL must be version 4.1 or later

Modified from HPA351 rev E2 by Todd Beliefski

TEXAS INSTRUMENTS

4 outputs off 5Vin with PMBus

AVCC 1.1V 5.1A

PMP5098
With resistor values shown

PMbus address for this channel
will be 25 decimal or 37 output if ALT_PMBUS_ADDR is open
and 33 decimal or 41 output if ALT_PMBUS_ADDR is grounded

Hence, PWM gain = 6

For U201: TPS40400RH must be version 4.1 or later
Switching losses:
- Switching RDS(on) x Iout
- hfe x VDS x Iout

Q302 cond. losses: 78mW max
gate drive losses: 11mW

2.2ns gate charge
4.1ns turnaround time max

With resistor values shown:
PMBus address for this channel will be 26 decimal or 32 octal if ALT_PMBUS_ADDR is open
and 34 decimal or 42 octal if ALT_PMBUS_ADDR is grounded.

Vin = 2.5V ± 5%
Hence, PWM gain = 6

For U301: TPS40400RH must be version 4.0 or later
Switching losses
5V, 2.6A, 50MHz = 180mW
Hi side cond. losses = 155mW
or total Q481 losses = 285mW

Q482 cond. losses: 177mW max
gate drive losses: 1mW

2.2kΩ gate charge
41mΩ @ 8V Max

With resistor values shown
PMBus address for this channel
will be 27 decimal or 33 octal if ALT_PWRBUS_ADDR is open
and 25 decimal or 43 octal if ALT_PWRBUS_ADDR is grounded

Vops = Vin/5
Hence, PMW gain = 6

For U401: TPS40400RHL must be version 4.0 or later
For signal names specific to each of the 4 channels:
The "MGTH" prefix has been removed.

Target 500kHz PWM
period = 0.7/(C4*(R20+R2))
plus about 600ns of delays

At 500kHz target internal delays are significant and need to be accounted for in setting frequency.

Nov. 28, 2009
R2, R20, C4 adjusted in Test
to get near 500kHz

Current sense with external 5mOhms sense resistors:
Toll controller sense value is 1.952mOhms
to get best bit resolution of 24.4mA per bit. (122uV per bit)
Current readings will be scaled by 62.5/24.4 or 5/1.952 or by 2.561

plan is to start up all channels
at 400kHz and sync up to 500kHz
from this TLC555
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