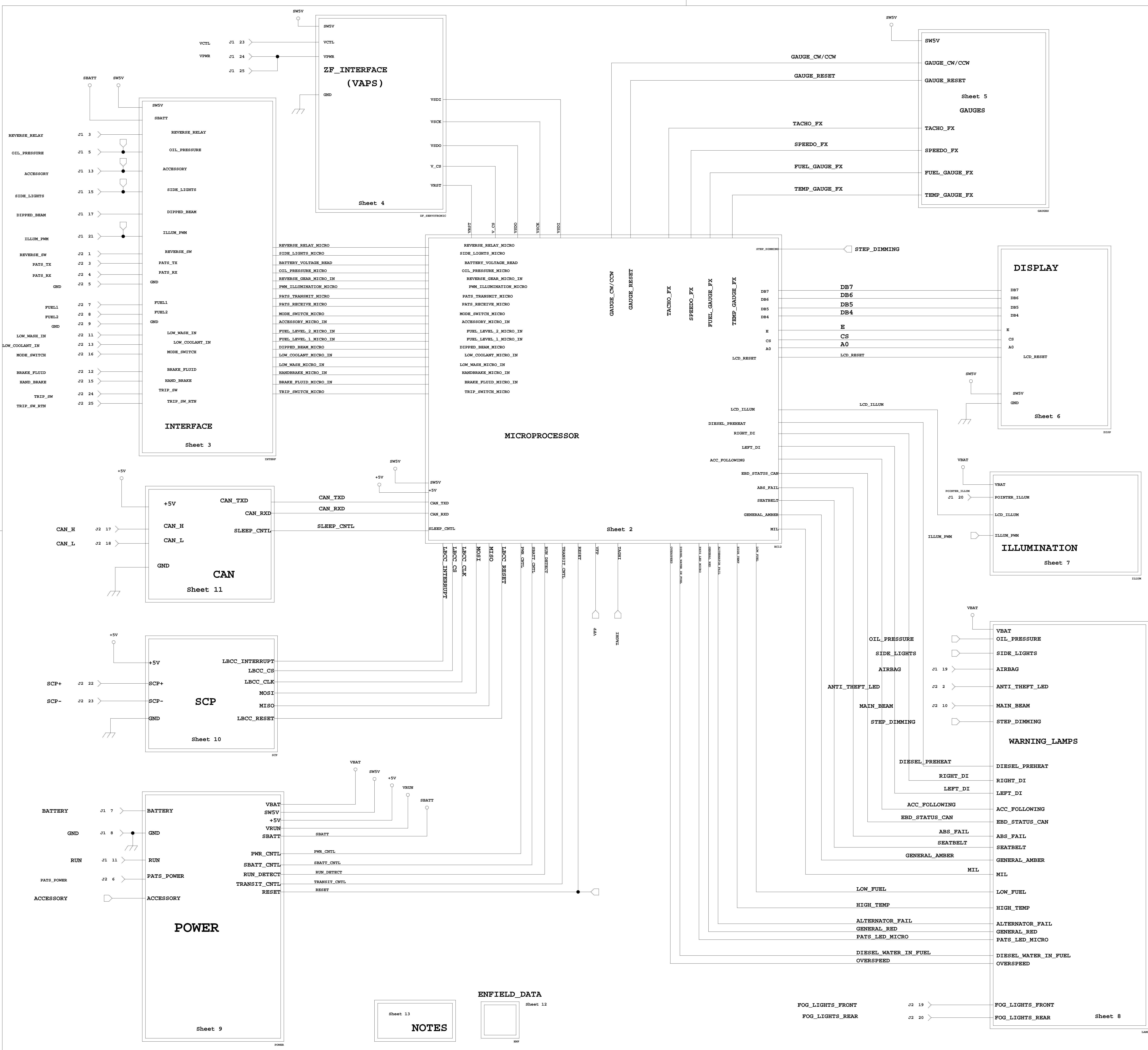




DATE	LET	REVISIONS	CG	MAN	CK	APP
11-07-00		New version of PWB 8175				PVT
11-08-00	B	Rev Gauge, Di LED				PVT
17-10-00	C	Part No Change to LED etc				PVT
03-03-03	2A	New I/F Connector				PVT
03-03-04	2B	ICD components updated for BMC				PVT
03-03-12	2C	Component updated to match BMC				PVT
03-03-20	2D	Physical updated to match PWB				PVT
03-03-21	2E	Physical PISO changed to PARTER				PVT



PART MUST COMPLY WITH SPECIFICATION MS8-8959999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL  "E" SIZE

CU COLOR = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH 0 1 2 3 4 5 6

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/CHK/SCH NAME	DATE	CHECKED	SCALE	APPROVED
	P. TRASLER	02/08/18	S. PURCELL	NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN:  INCHES  MILLIMETERS  
 MACHINED DIM. +/- ANGULAR DIM. +/-

3RD ANGLE PROJECTION  
 STAMPED DIM. +/-

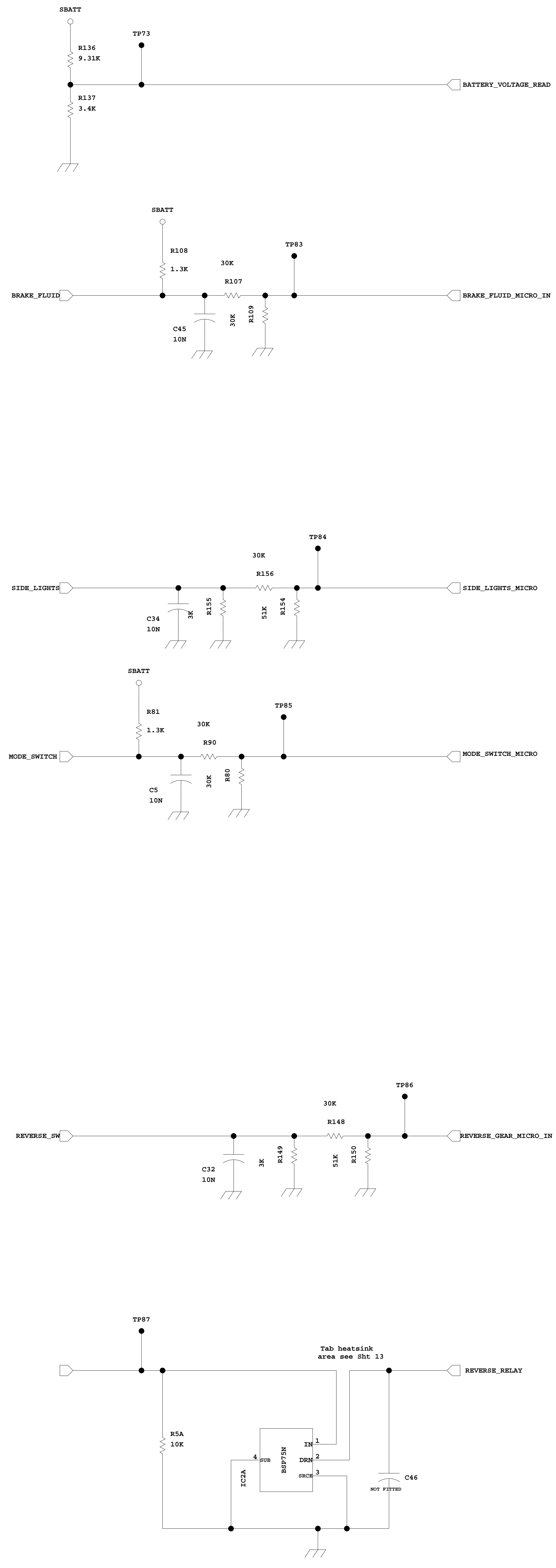
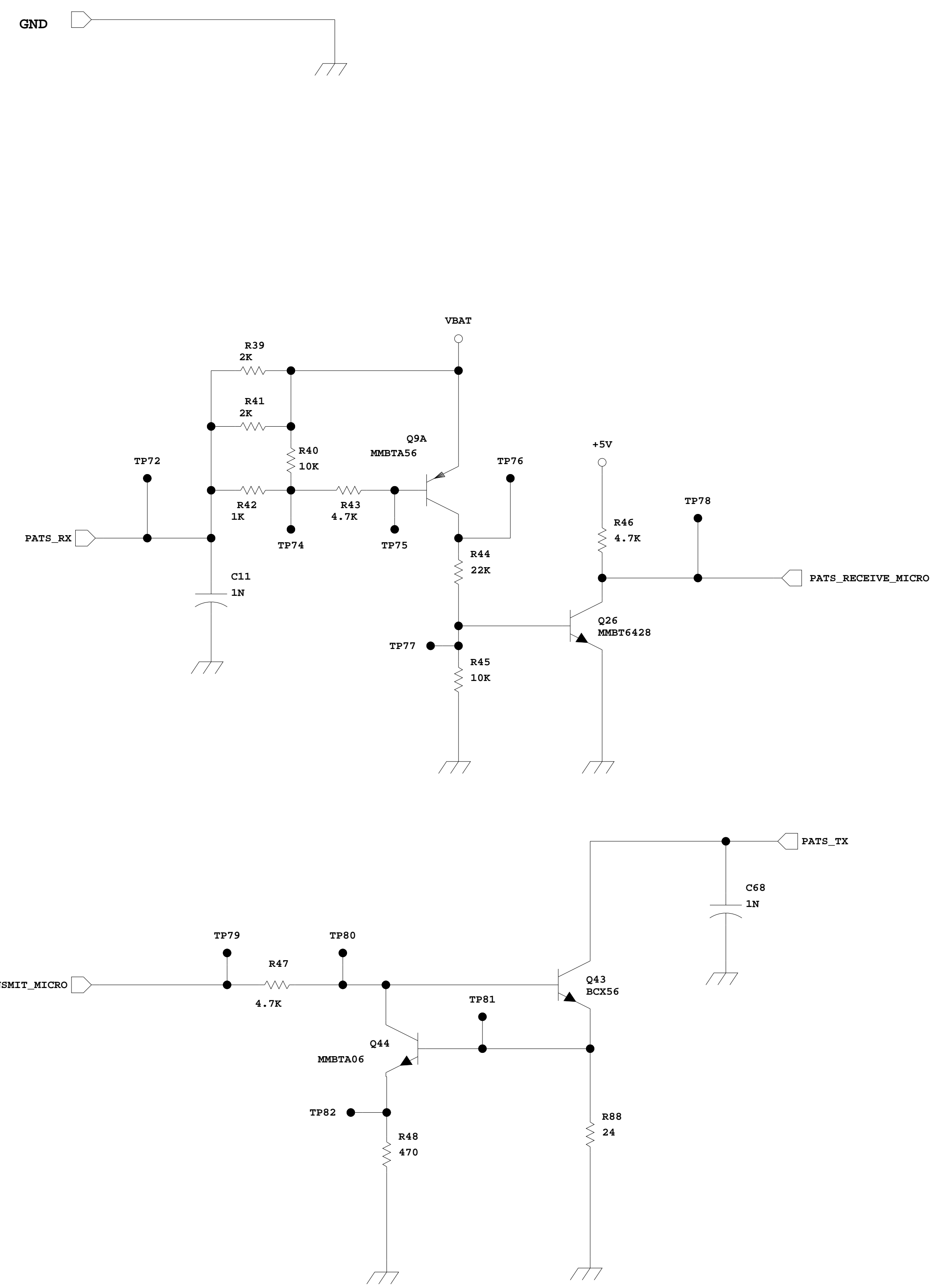
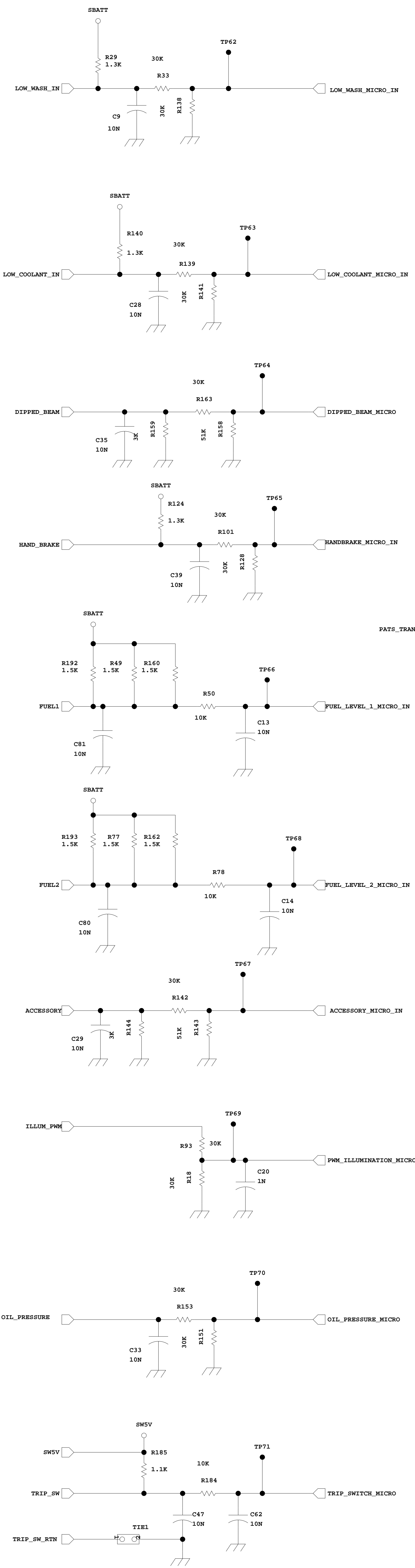
MATERIAL: \_\_\_\_\_ APP: \_\_\_\_\_  
 DATE: **02C21**

NAME: SKETCH - WIRING DIAGRAM  
 X400 HIGH SERIES

NO. **VH4X4F-3458-DK**

X400 HI Shit 2 TOP





NO.		REVISIONS		CU	MAN	CK	APP
11-07-00	Rev version of PWB 8375	PVT					
01-03-01	Rev IIP Connector	PVT					
01-03-12	IC Components updated to match BOM	PVT					

FAST MUST COMPLY WITH SPECIFICATION MGS-8959999-01 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL **"E"** SIZE

CU COLUMN - GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCH/SCH_NAME	DATE	CHECKED	SCALE	APPROVED
		00-08-18	S. PURCELL	NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  
 INCHES  MILLIMETERS  
 MACHINED DIM. +/-  
 ANGULAR DIM. +/-

3RD ANGLE PROJECTION  
 STAMPED DIM. +/-

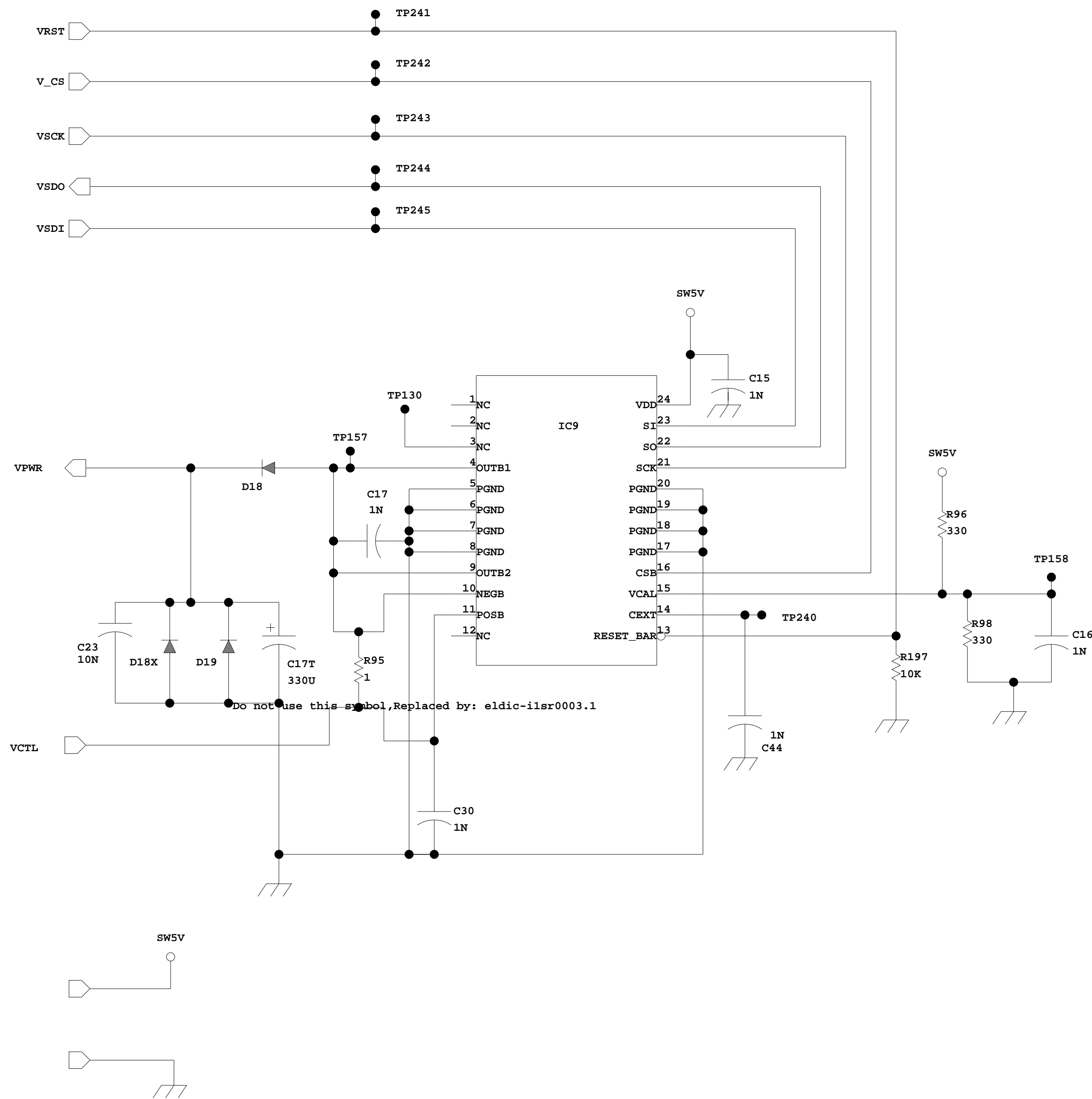
MATERIAL APP

DATE **02C12**

NAME SKETCH - WIRING DIAGRAM  
 X400 HIGH SERIES

NO. **VH4X4F-3458-DK**

X400 HI Sht 4 INTERFACE



NO. **VH4X4F-3458-DK**

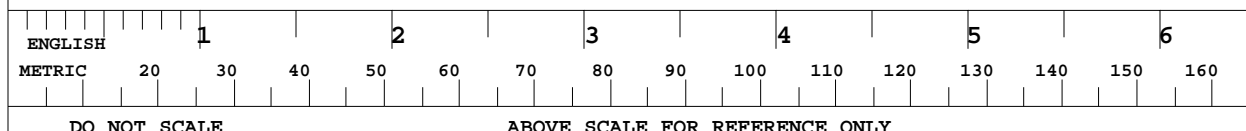
DATE	LET	REVISIONS	CG	MAN	CK	APP
12-07-00		New version of PWB 8375				FVT
02-03-05	2A	New ZIF Connector				FVT

PART MUST COMPLY WITH SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL "C" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED



REF	PROJECT/SCH/SCH_NAME	DRAWN BY	DATE	CHECKED	SCALE	APPROVED
		P.V.TRASLER	00-08-18	XXXX	NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  INCHES  MILLIMETERS  
 MACHINED DIM. +/-  
 ANGULAR DIM. +/-

3RD ANGLE PROJECTION  
 STAMPED DIM. +/-

MATERIAL	APP
	DATE
	<b>02C05</b>

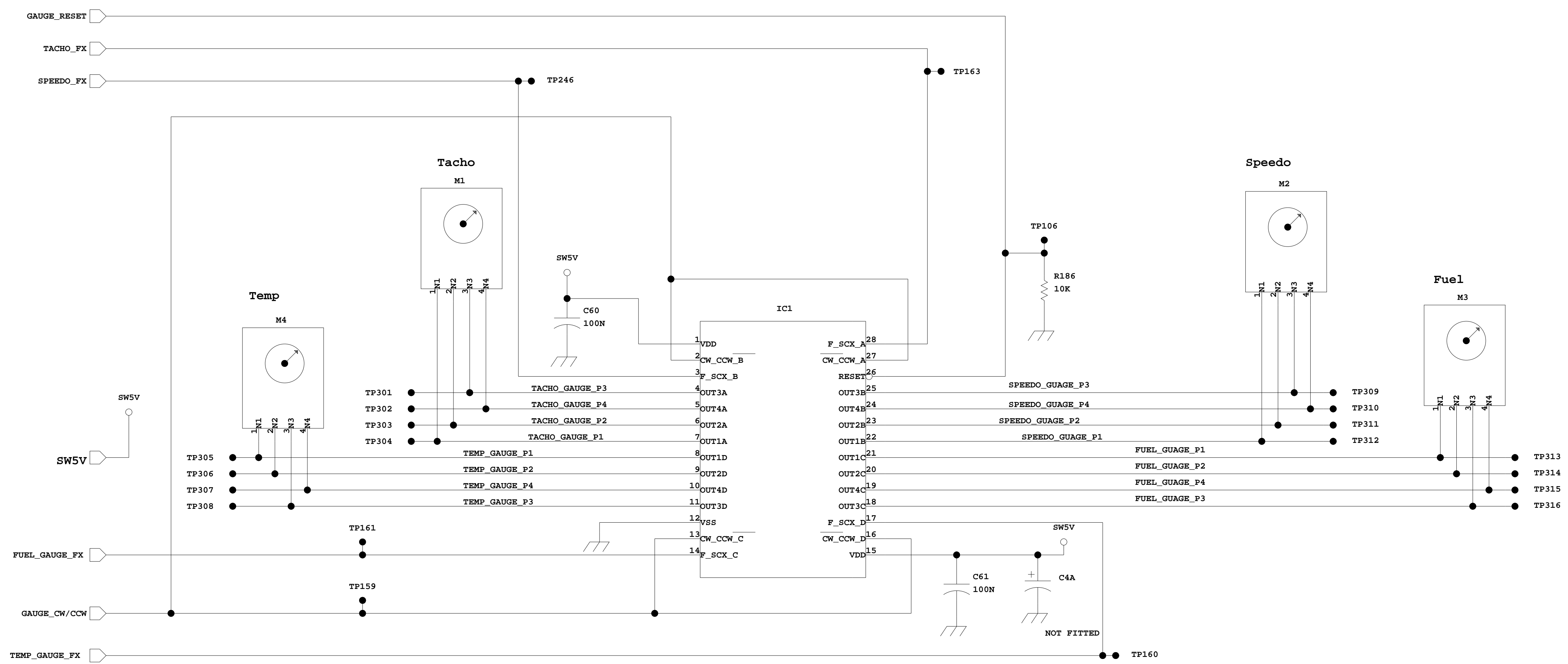
NAME SKETCH - WIRING DIAGRAM  
 X400 HI VAPS

NO. **VH4X4F-3458-DK**

X400 HI Sht 5 VAPS

NO.		VH4X4F-3458-DK				
DATE	LET	REVISIONS	CG	MAN	CK	APP
12-07-00		New version of PMB 8375				PVT
17-08-00	B	C4A not fitted				PVT
02-03-12	2C	Components updated to match BOM				PVT

Gauge positions are shown as seen from front of cluster



PART MUST COMPLY WITH SPECIFICATION WSS-M99P9999-11 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL "D" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH 1 2 3 4 5 6  
METRIC 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCH/SCH_NAME

DRAWN BY	DATE	CHECKED	SCALE	APPROVED
P. TRASLER	00-08-18	S. FURCELL	NONE	

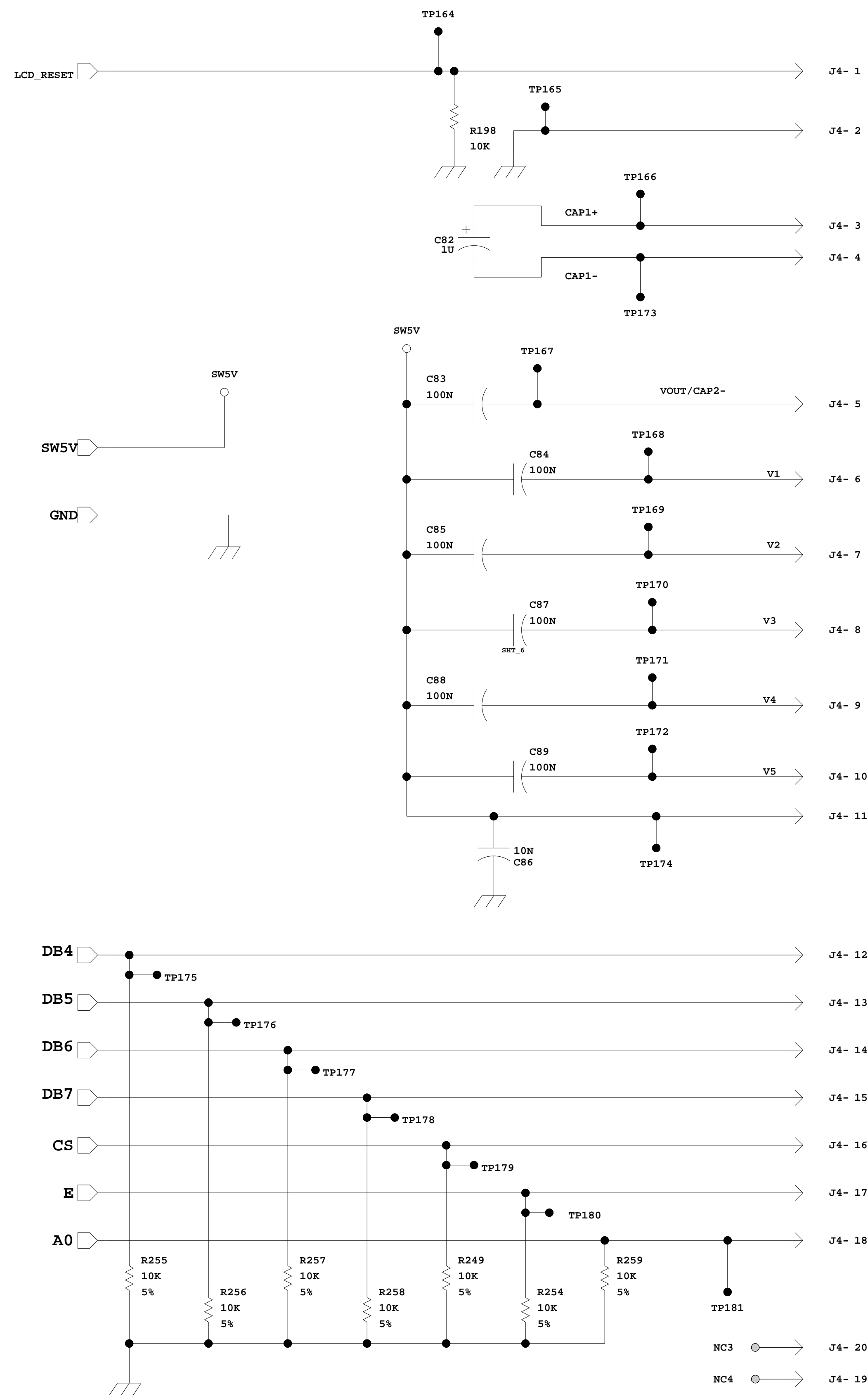
UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  INCHES  MILLIMETERS  
 MACHINED DIM. +/- 3RD ANGLE PROJECTION  
 ANGULAR DIM. +/- STAMPED DIM. +/-

MATERIAL	APP
	DATE
	02C12

NAME SKETCH - WIRING DIAGRAM  
X400 HIGH SERIES

NO. VH4X4F-3458-DK

X400 HI Sht 6 GAUGES



Note. Need EMC to check.

NO. VH4X4F-3458-DK				CG	MAN	CK	APP
DATE	LET	REVISIONS					
12-07-00		New version of PWB 8375	PVT				
02-03-05	2A	New ZIF Connector	PVT				
02-03-06	2B	LCD components updated for EMC	PVT				
02-03-12	2C	Components updated to match BOM	PVT				

PART MUST COMPLY WITH SPECIFICATION WSS-M99F9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL "D" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH 1 2 3 4 5 6  
METRIC 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCH/SCH_NAME

DRAWN BY	DATE	CHECKED	SCALE	APPROVED
P. TRASLER	00-08-18	S. FURCELL	NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  INCHES  MILLIMETERS  
 MACHINED DIM. +/-  
 ANGULAR DIM. +/-

3RD ANGLE PROJECTION  
 STAMPED DIM. +/-

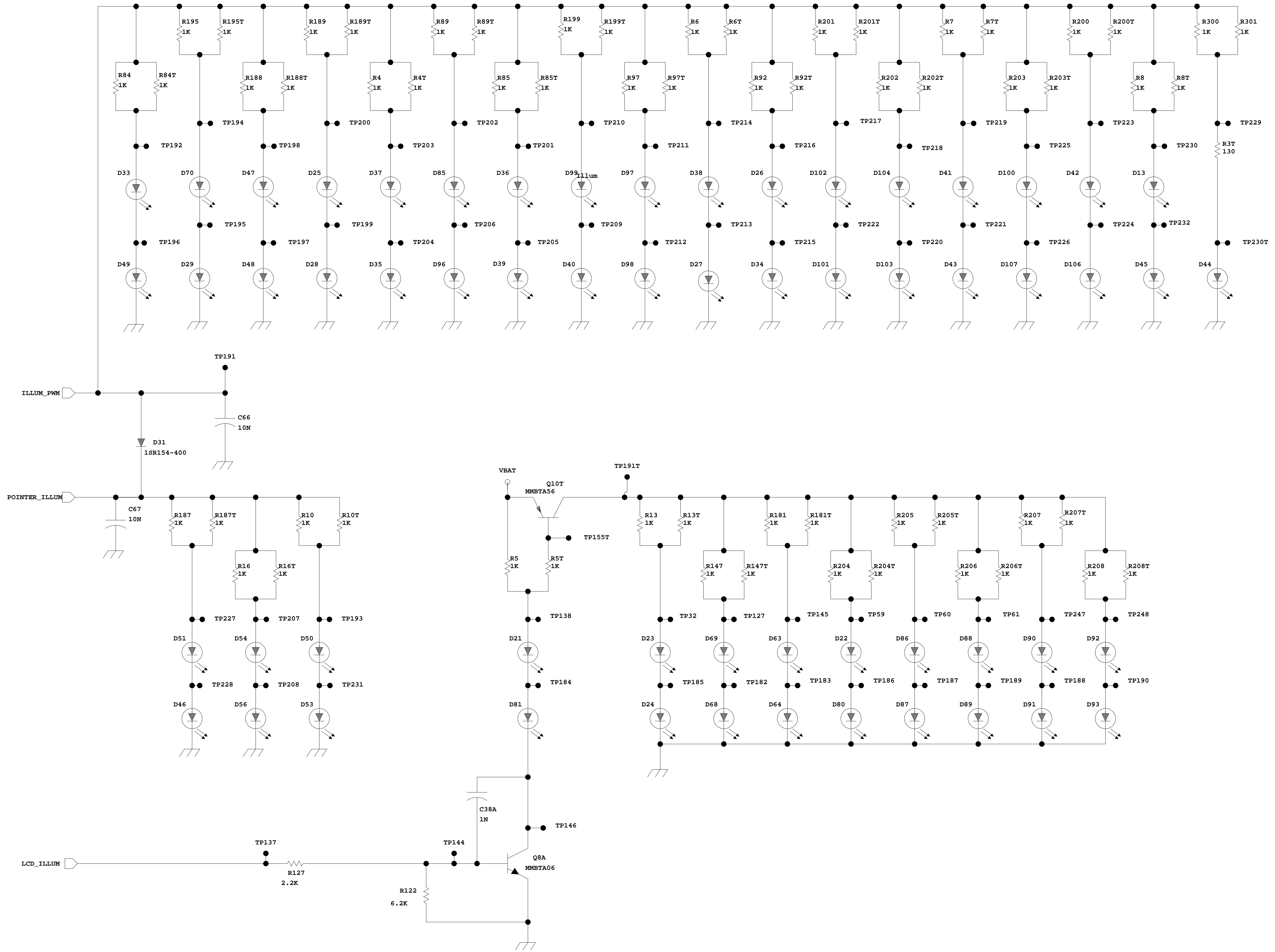
MATERIAL	APP
	DATE
	02C12

NAME SKETCH - WIRING DIAGRAM  
 X400 HIGH SERIES

NO. VH4X4F-3458-DK

X400 HI Sht 7 DISPLAY POWERVIEW

Top side of board to have white pass



NO. **VH4X4F-3458-DK**

DATE	LET	REVISIONS	CG	MAN	CK	APP
12-07-00		New version of PWB 8375				PVT
19-07-00		Test point added				PVT
02-03-05	2A	New ZIP Connector				PVT

PART MUST COMPLY WITH SPECIFICATION WSS-M99F9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL "D" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH 1 2 3 4 5 6  
METRIC 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCH/SCH_NAME	DATE	CHECKED	SCALE	APPROVED
		00-08-18	S. FURCELL	NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  
 INCHES  MILLIMETERS  
 MACHINED DIM. +/-  
 ANGULAR DIM. +/-

3RD ANGLE PROJECTION  
 STAMPED DIM. +/-

MATERIAL	APP
	DATE
	02C05

NAME SKETCH - WIRING DIAGRAM  
X400 HIGH SERIES

NO. **VH4X4F-3458-DK**

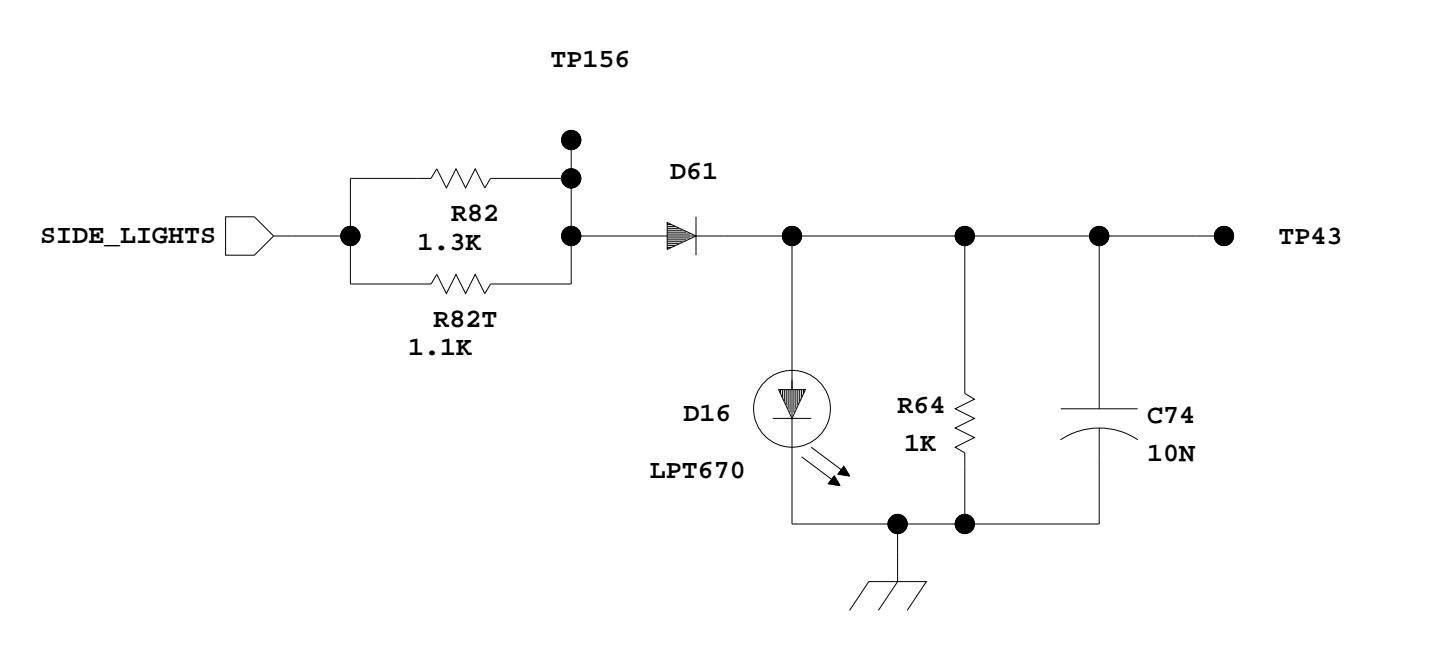
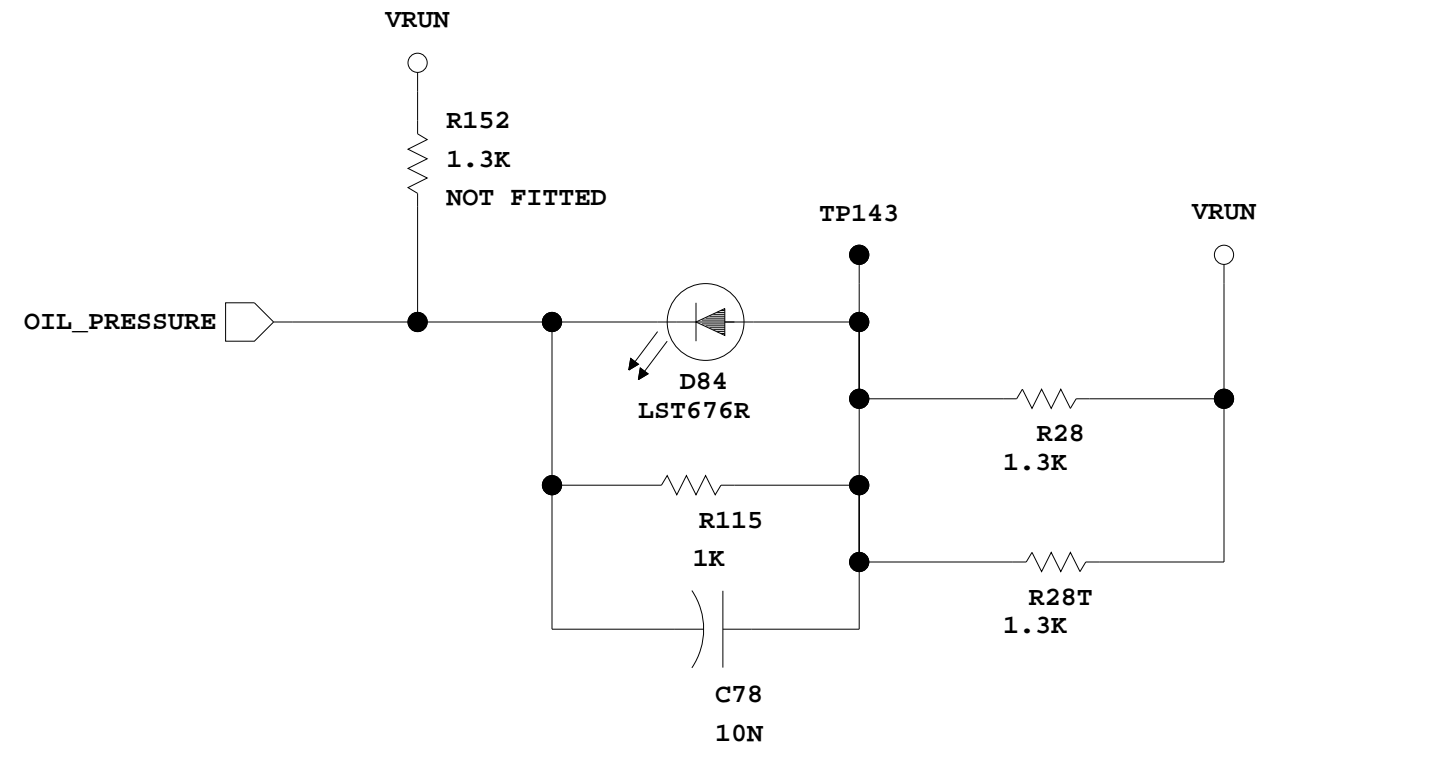
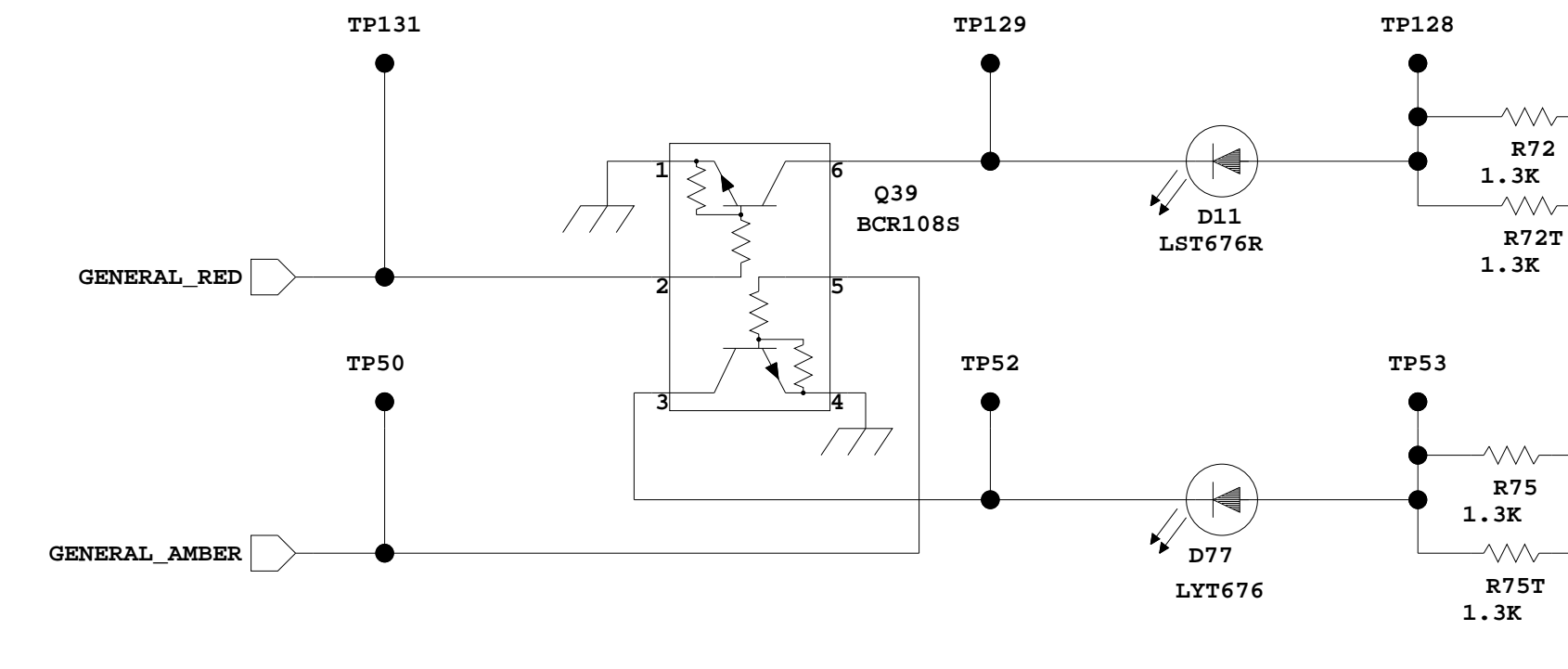
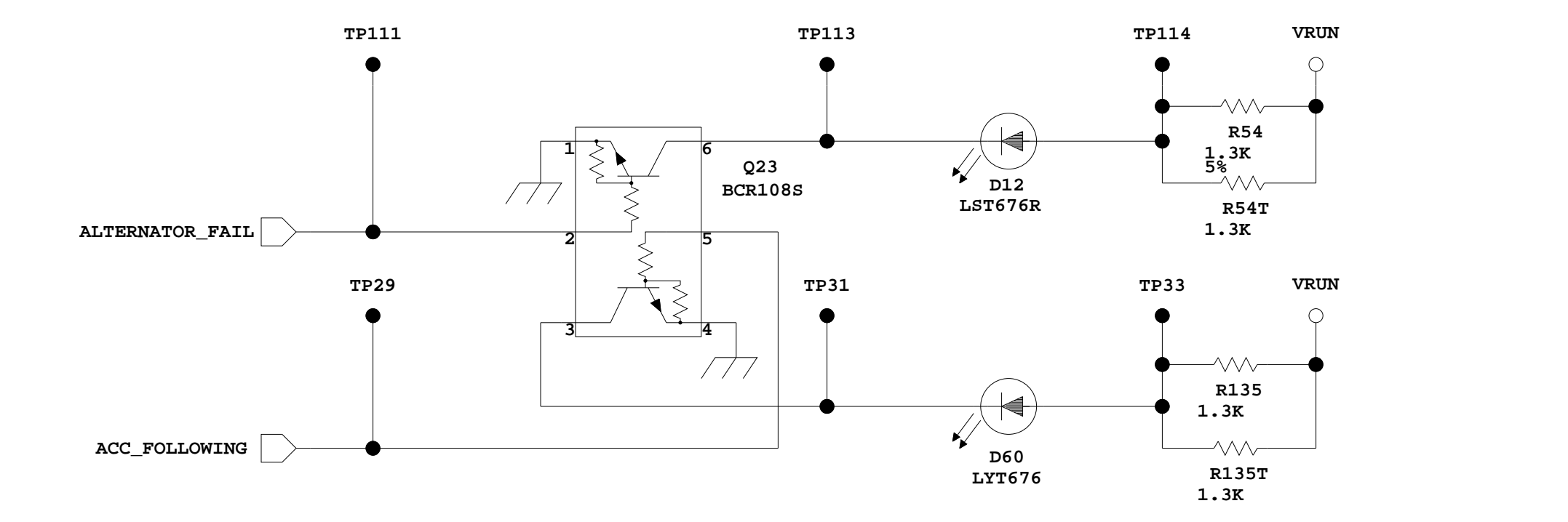
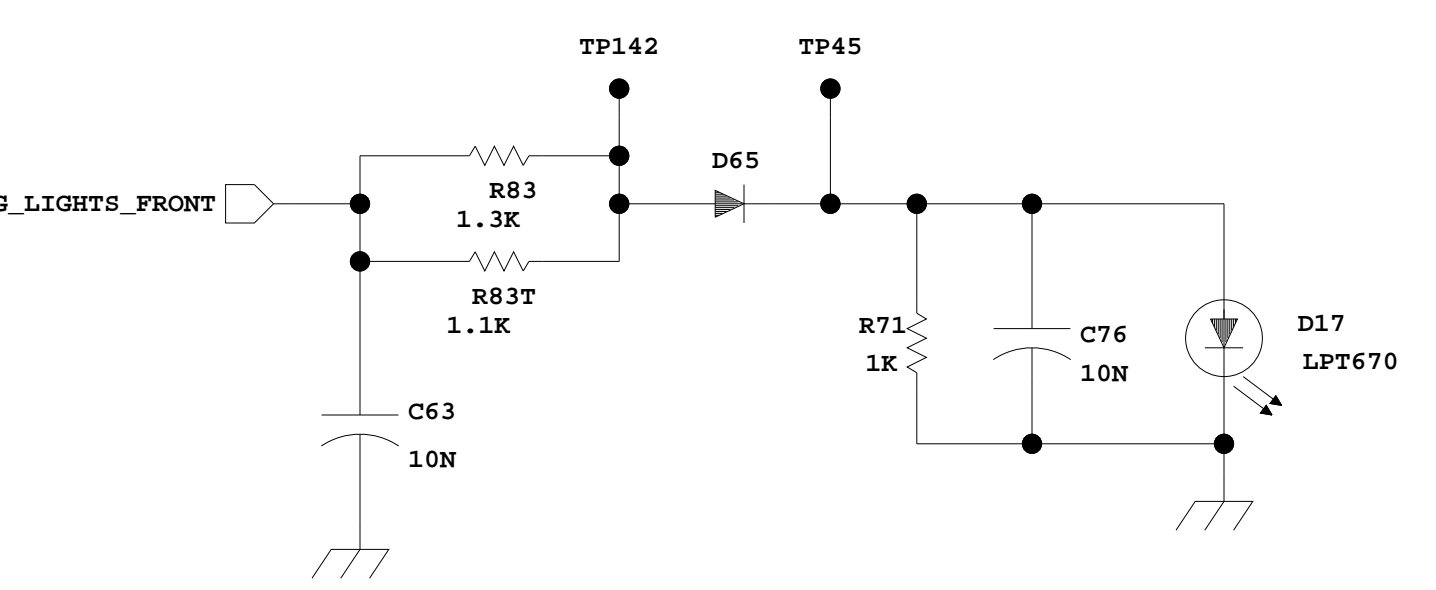
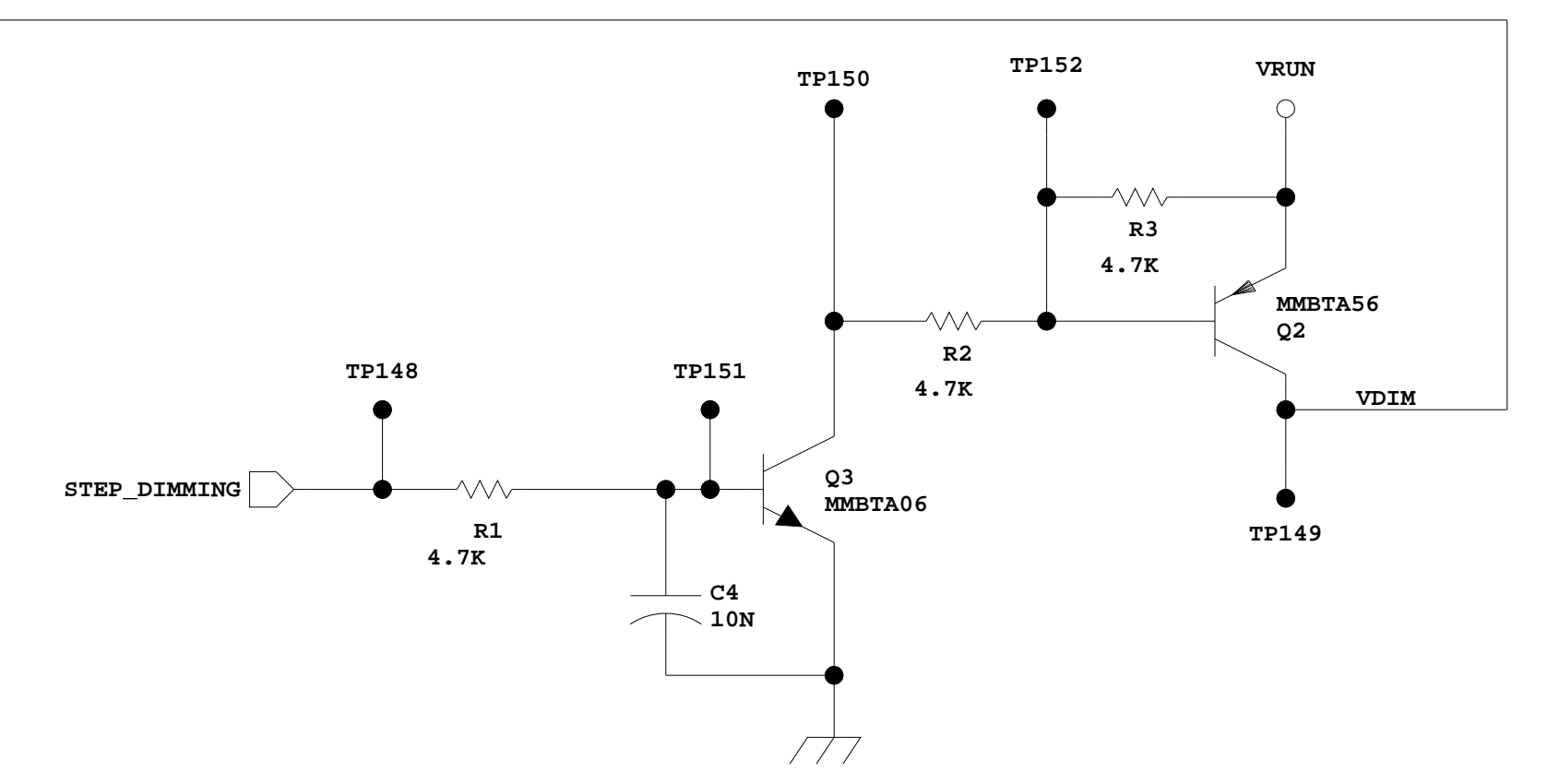
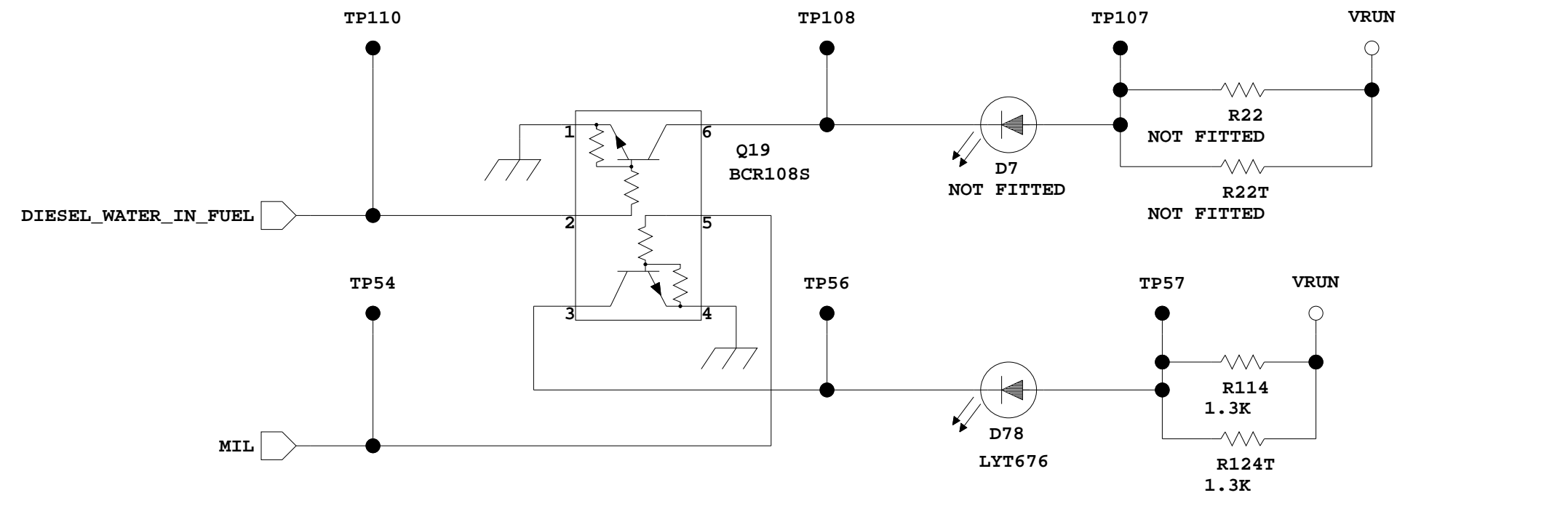
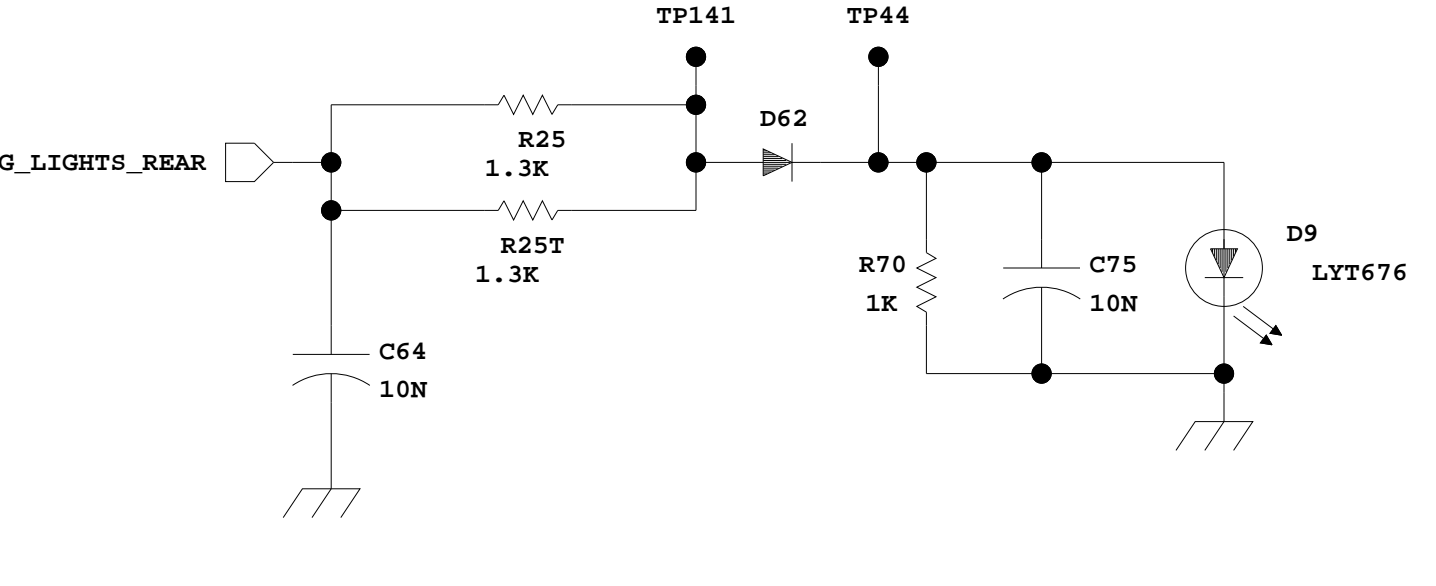
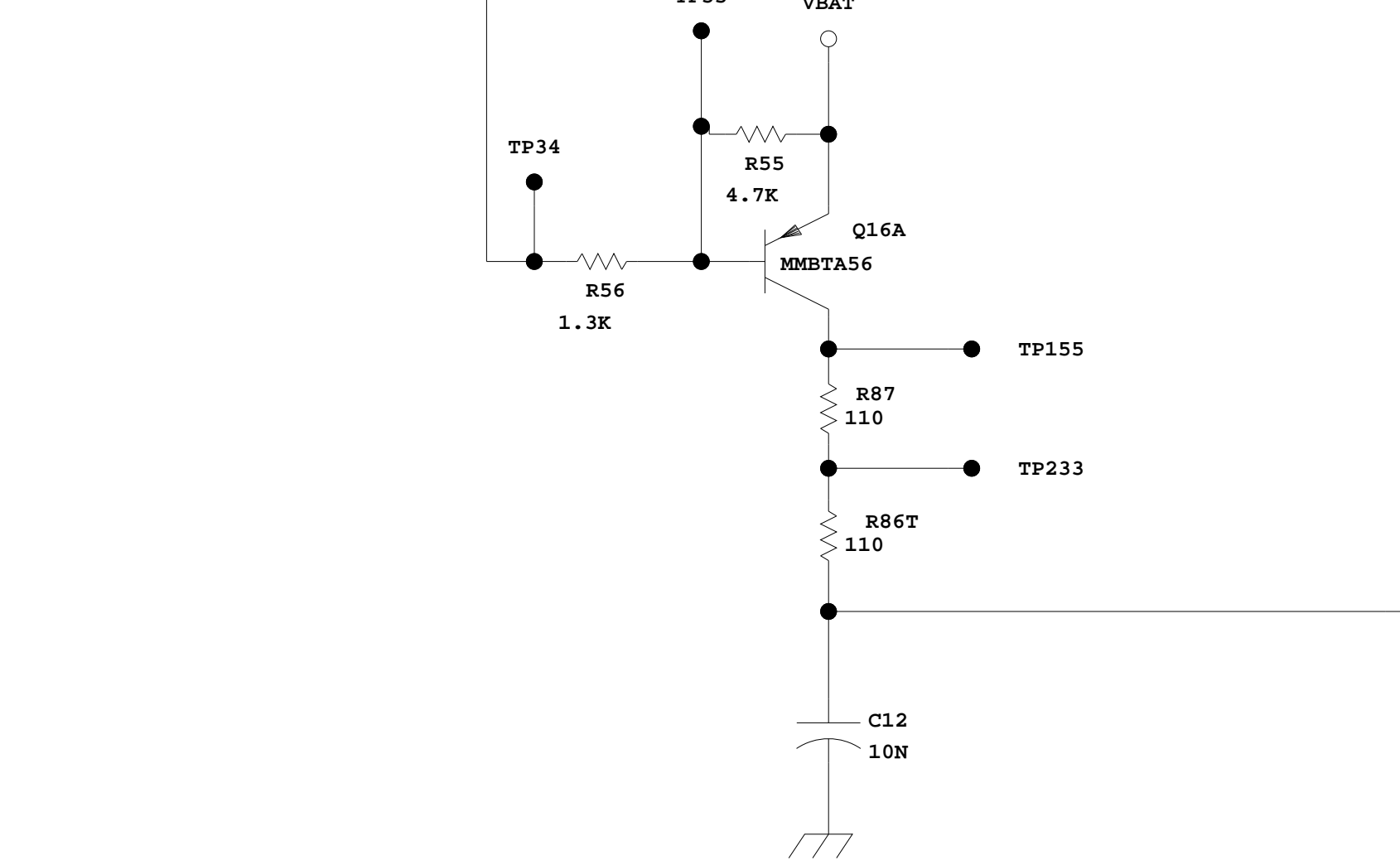
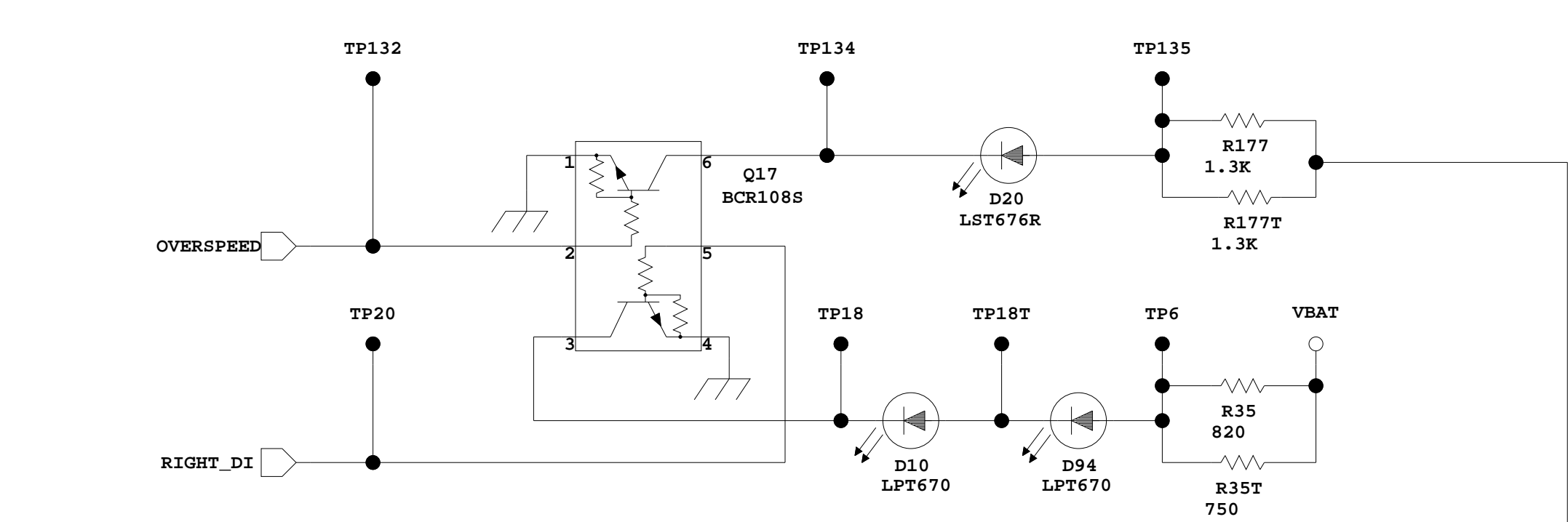
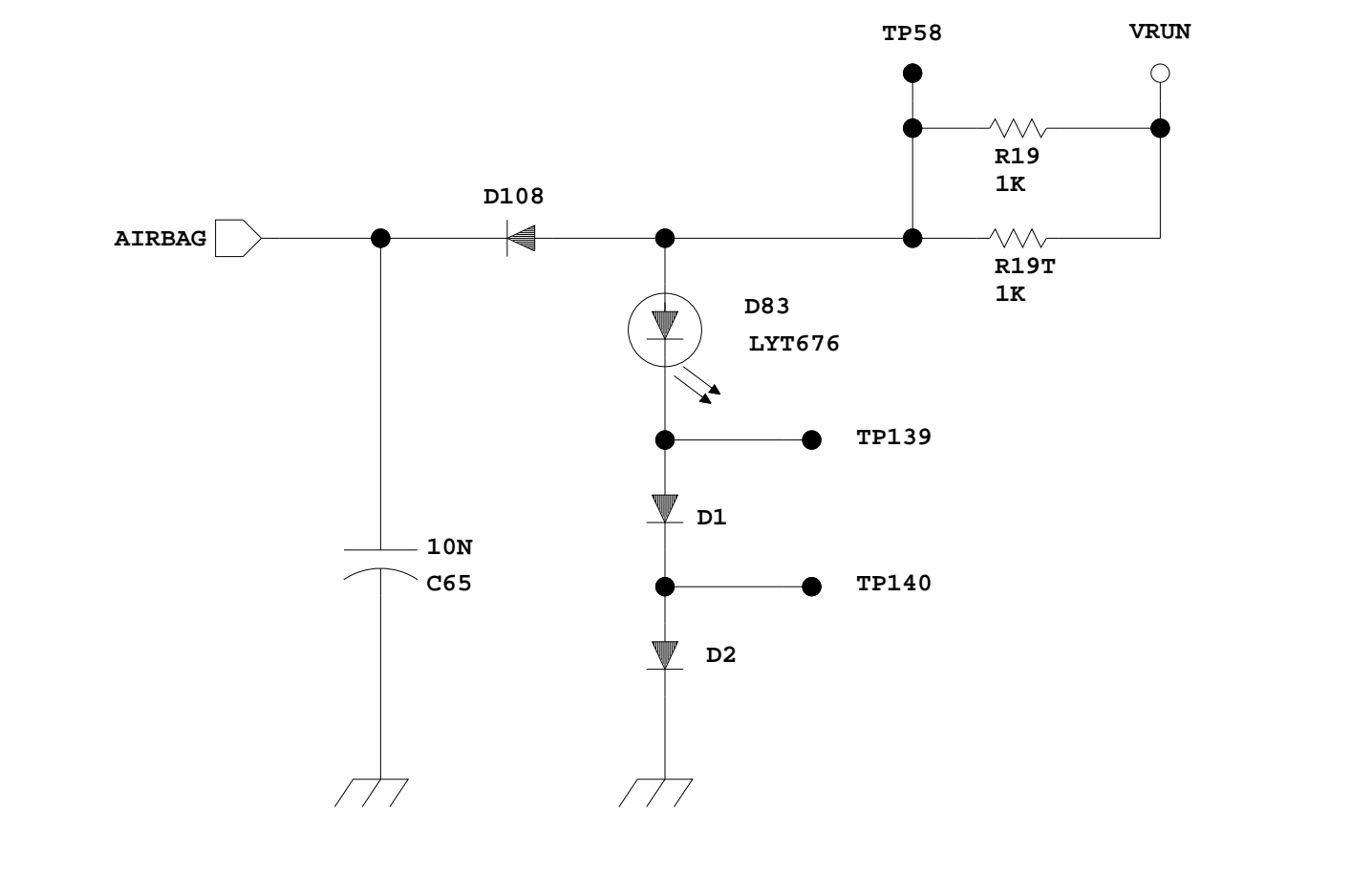
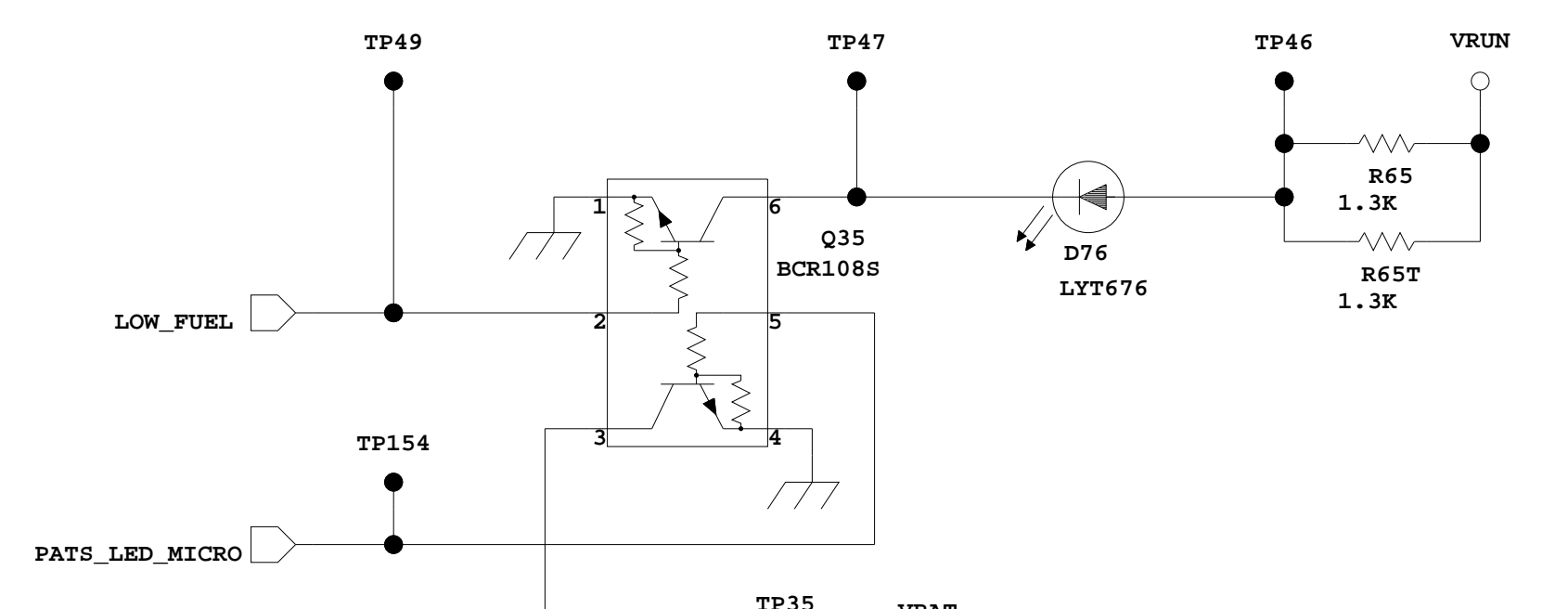
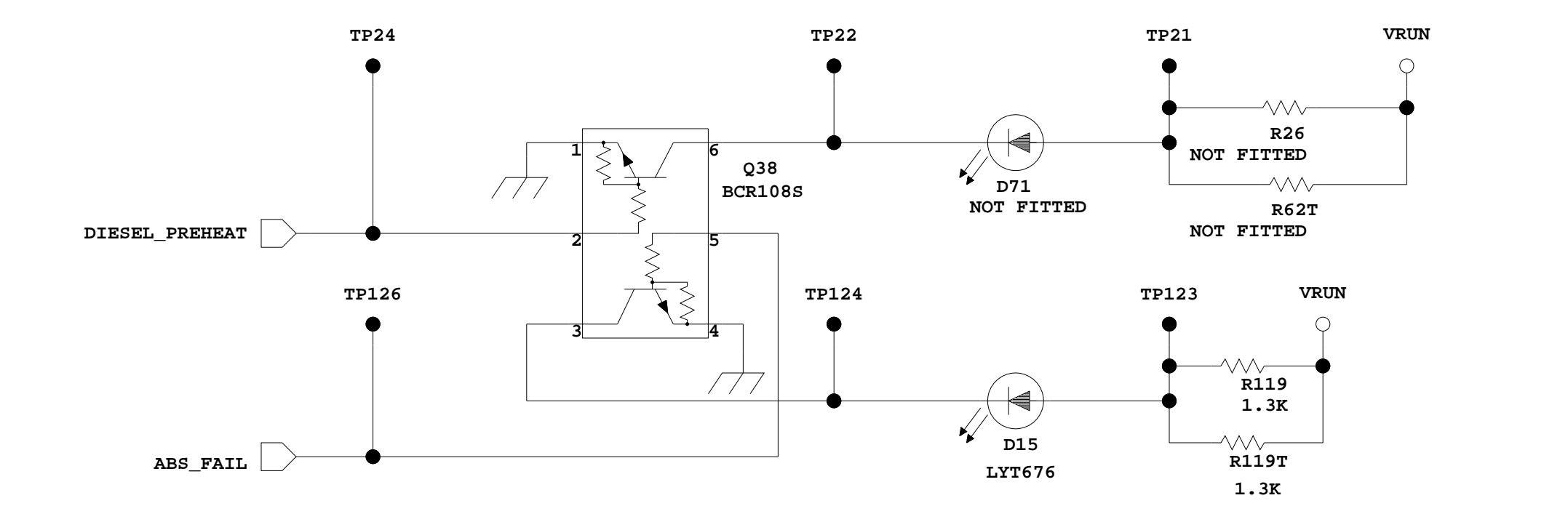
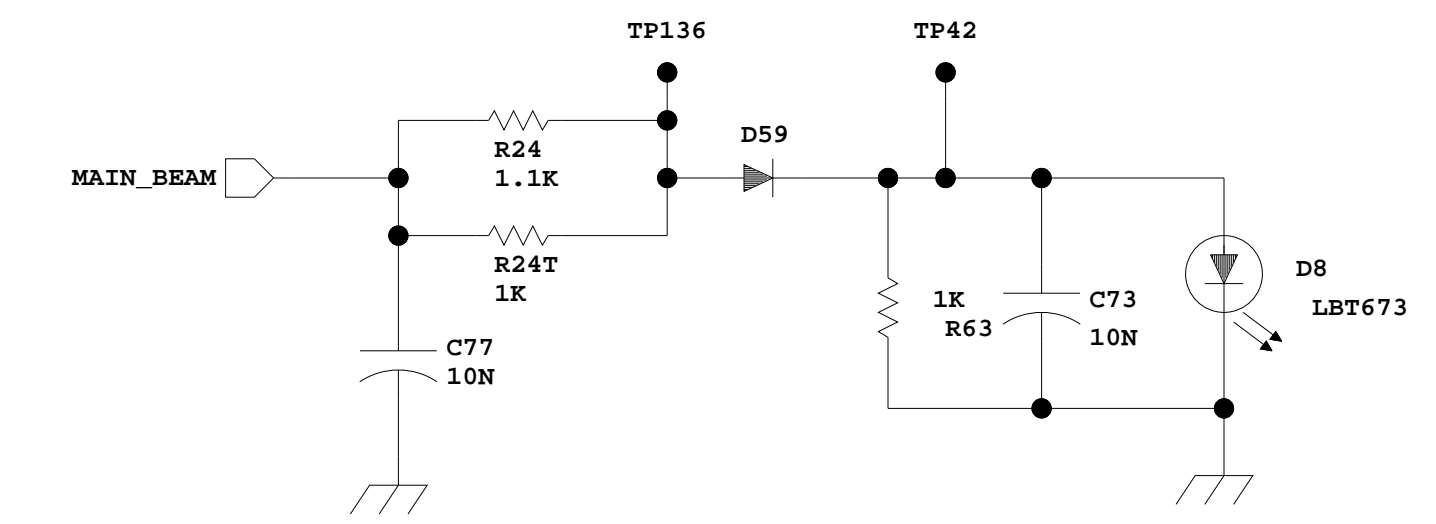
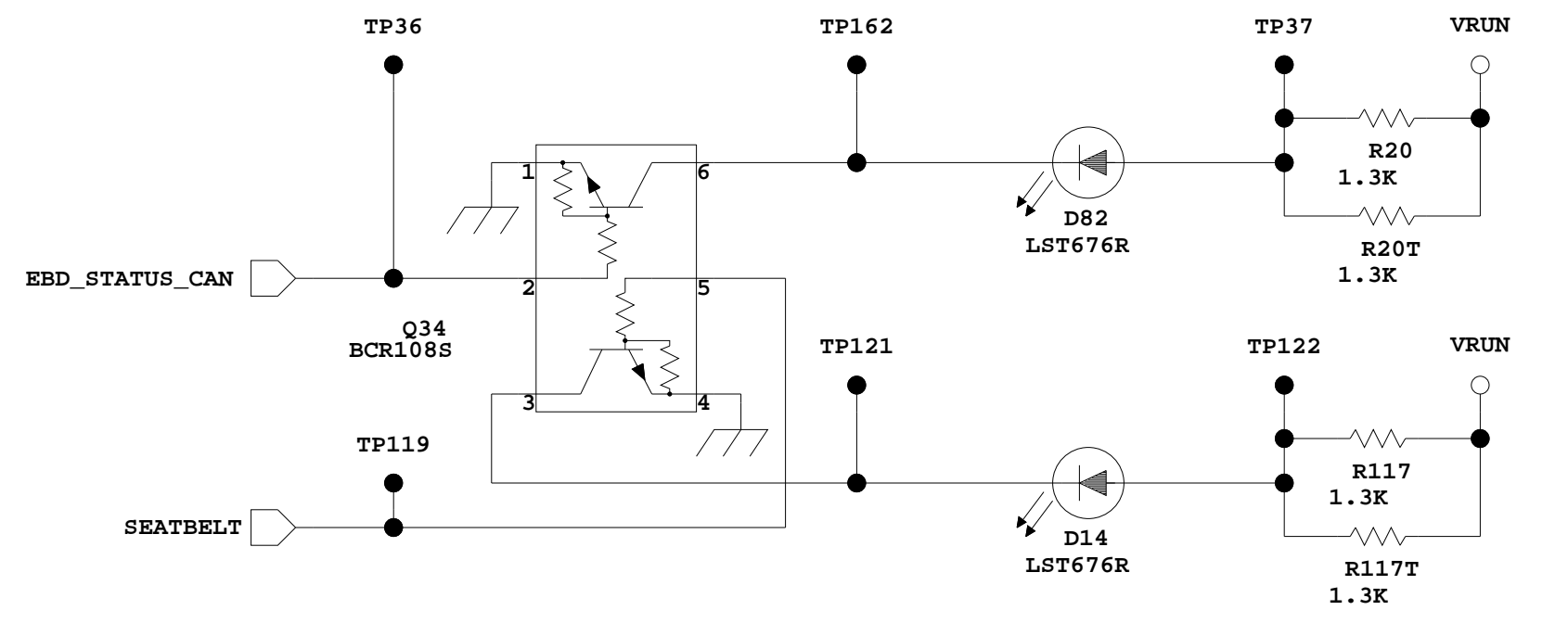
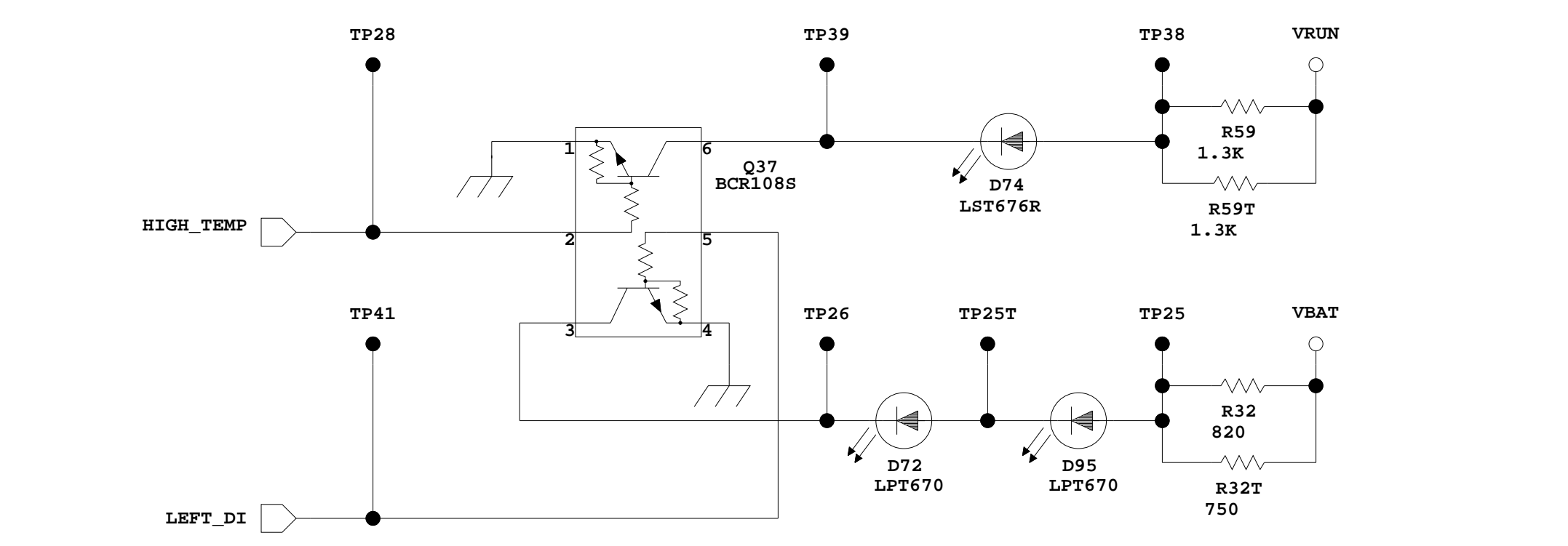
X400 HI Sht 8 ILLUM POWERVIEW



>>16MM2 COPPER PLANE TO BE ADDED TO CATHODE OF ALL LED'S

NO. VH4X4F-3458-DK

DATE	LET	REVISIONS	CU	MAN	CK	APP
11-07-00		New version of PWB 8375				PVT
11-08-00	H	Part 0204p D1 LEDs				PVT
11-10-00	C	Red LEDs Change to LST676R				PVT
02-03-03	2A	New ZIP Connector				PVT
02-03-12	2C	Components updated to match SCM				PVT



PART MUST COMPLY WITH SPECIFICATION MSC-899999-01 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL  "E" SIZE

CU COLUMN - GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH 00 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCN/CHK NAME	DATE	CHECKED	SCALE	APPROVED
		00-08-18	S. PURCELL	NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  INCHES  MILLIMETERS  
 MACHINED DIM. +/-  
 ANGULAR DIM. +/-

3RD ANGLE PROJECTION  
 STAMPED DIM. +/-

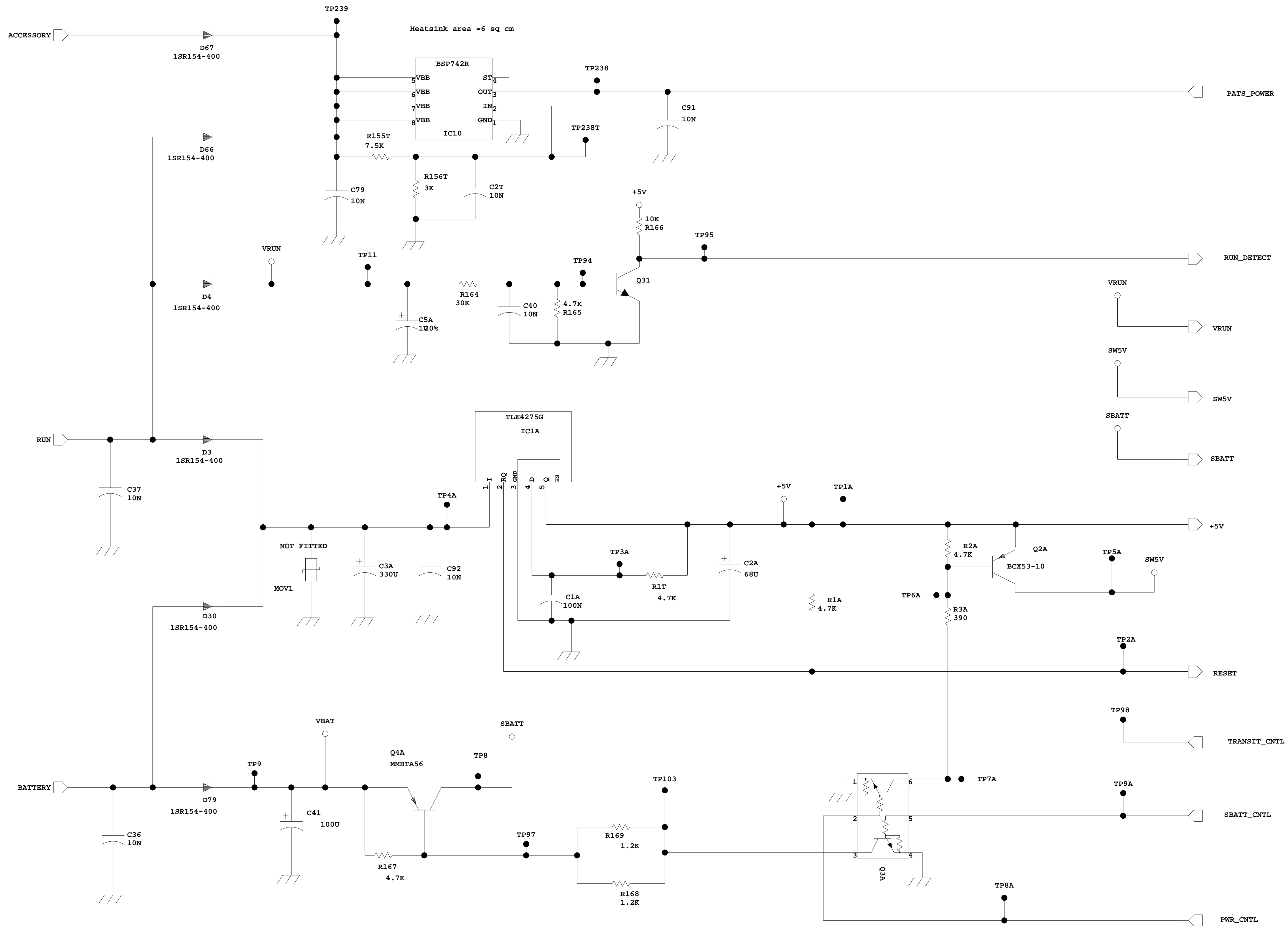
MATERIAL APP

DATE **02C12**

NAME SKETCH - WIRING DIAGRAM  
 X400 HIGH SERIES

NO. **VH4X4F-3458-DK**

X400 HI Sht 9 LAMP



NO. VH4X4F-3458-DK						
DATE	LET	REVISIONS	CG	MAN	CK	APP
12-07-00		New version of PWB 8375				PVT
19-07-00		Test point added				PVT
02-03-05	2A	New ZIP Connector				PVT
02-03-12	2C	Components updated to match BOM				PVT

PART MUST COMPLY WITH SPECIFICATION WSS-M99F9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL "D" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH 1 2 3 4 5 6  
 METRIC 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCH/SCH_NAME

DRAWN BY	DATE	CHECKED	SCALE	APPROVED
P. TRASLER	00-08-18		NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  INCHES  MILLIMETERS  
 MACHINED DIM. +/- STAMPED DIM. +/-  
 ANGULAR DIM. +/- 3RD ANGLE PROJECTION

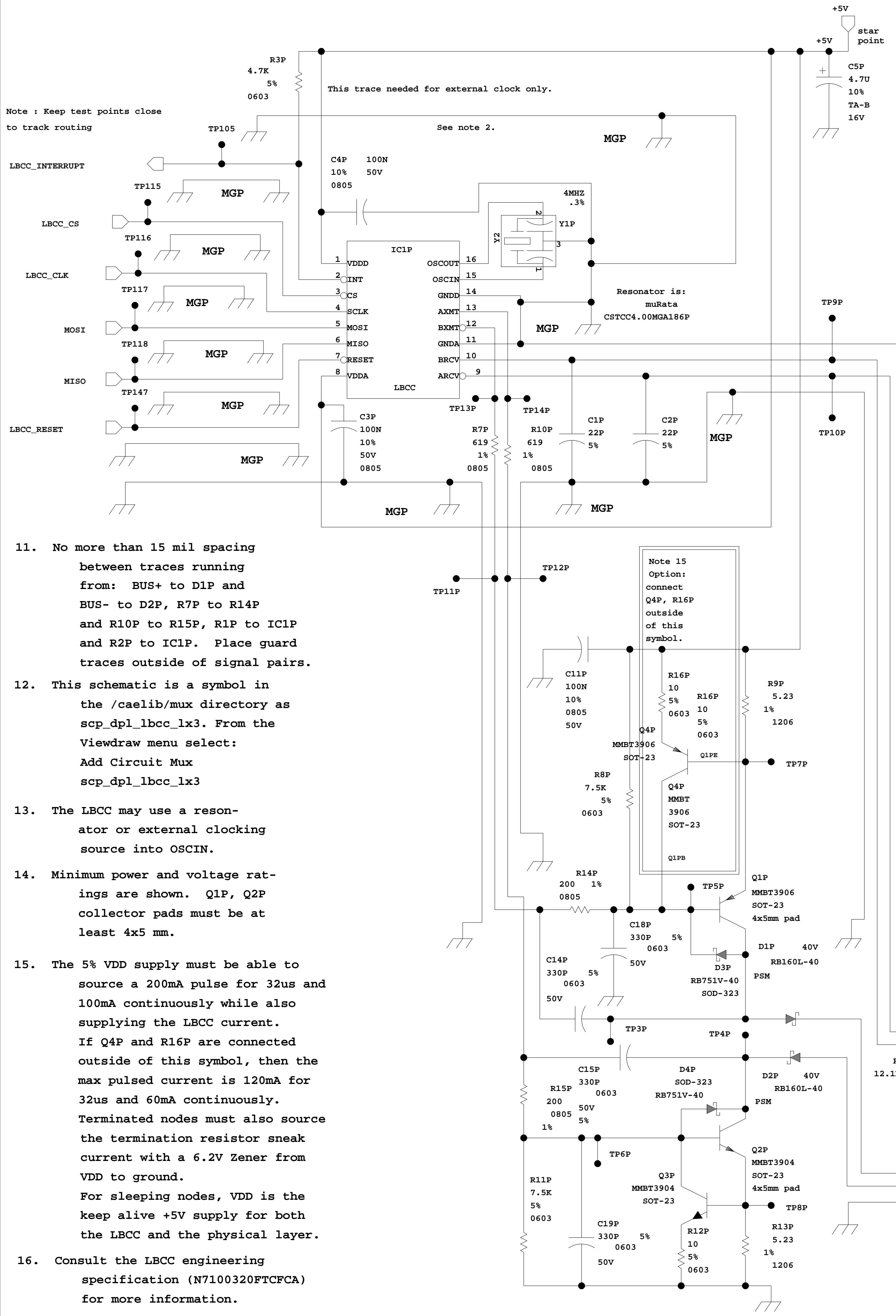
MATERIAL	APP

NAME	DATE
SKETCH - WIRING DIAGRAM	02C12
X400 HIGH SERIES	

NO. VH4X4F-3458-DK

X400 HI Sht 10 POWER

SCP PHYSICAL LAYER EMC LAYOUT REQUIREMENTS



1. Place a Microchip Ground Plane (MGP) under IC1P. The MGP exists directly under and on the PCB solder layer of IC1P. Connect GNDA and GNDD to the MGP with at least a 10 mil track. Connect Y1P, C1P, C2P, C3P and C4P to the MGP.
2. Denotes a guard track next to a high speed track. Place CS\*, SCLK, MOSI, MISO, INT\*, and OSCIN (if the LBCC is externally driven) over a ground plane. In addition, place a guard track next to each of these high speed tracks. Connect one end of the guard tracks to the IC1P MGP. Connect the other end of the guard tracks to the host microprocessor MGP. The IC1P MGP and the host microprocessor MGP are the same ground.
3. The positive side of C5P is the star point connection for VDD. Run separate traces for IC1P-1 and IC1P-8 to the C5P VDD star point.
4. BUS+ and BUS- must be located on adjacent connector pins. Place C16P and C17P within 4mm of the BUS+, BUS- connector pins. Place LBCC away from connector and align LBCC parallel with connector.
5. Place R7P, R10P, C1P, C2P, C3P, C4P, and Y1P within 4mm of IC1P. Place IC1P as close as possible to the host microprocessor. Best placement for C3P and C4P is under IC1P MGP with the ground pads connected directly to IC1P MGP. If PWB is component top side only, connect C3P ground pad directly to IC1P-11 and C4P ground pad directly to IC1P-14. Place the tracks between Y1P and IC1P-15,16 on the bottom side to permit a top side direct connection of the C4P ground pad to IC1P-14.
6. Place R8P, R9P, R14P, C11P, C14P, C18P and D1P close to Q1P. Place C18P closest to Q1P with a good ground.
7. Place R11P, R12P, R13P, R15P, C15P, C19P, D2P and Q3P close to Q2P. Place C19P closest to Q2P with good GND.
8. Place R1P and R2P close to Bus+ and Bus- branch points.
9. At least 20 mil wide traces required for connecting: BUS+, BUS-, R9P, R13P, C16P, C17P, D1P, D2P, and collector and emitter of Q1P and Q2P.
10. Refer to SCP Vehicle Network Implementation requirements (ES-F7LC-12K529-D\_) and EESE for termination resistance. Termination power requirement is  $(24V \cdot 24V) / R_{bus}$  at rated module temperature. Suggested 360 Ohm resistors are leaded Dale CPF-2s or two 2512 180 Ohms in series.

- Note : Keep test points close to track routing
- See note 2.
- Resonator is: muRata CSTCC4.00MGA186P
- Note 15 Option: connect Q4P, R16P outside of this symbol.
11. No more than 15 mil spacing between traces running from: BUS+ to D1P and BUS- to D2P, R7P to R14P and R10P to R15P, R1P to IC1P and R2P to IC1P. Place guard traces outside of signal pairs.
  12. This schematic is a symbol in the /caelib/mux directory as scp\_dpl\_lbcc\_lx3. From the Viewdraw menu select: Add Circuit Mux scp\_dpl\_lbcc\_lx3
  13. The LBCC may use a resonator or external clocking source into OSCIN.
  14. Minimum power and voltage ratings are shown. Q1P, Q2P collector pads must be at least 4x5 mm.
  15. The 5% VDD supply must be able to source a 200mA pulse for 32us and 100mA continuously while also supplying the LBCC current. If Q4P and R16P are connected outside of this symbol, then the max pulsed current is 120mA for 32us and 60mA continuously. Terminated nodes must also source the termination resistor sneak current with a 6.2V Zener from VDD to ground. For sleeping nodes, VDD is the keep alive +5V supply for both the LBCC and the physical layer.
  16. Consult the LBCC engineering specification (N7100320FTCFCA) for more information.
  17. Run the Host Interface Test for 24 hours error free at rated module temperature extremes.

NO.		VH4X4F-3458-DK			CG	MAN	CK	APP
DATE	LET	REVISIONS						
12-07-00		New version of PWB 8375	PVT					
02-03-05 2A		New ZIP Connector	PVT					

PART MUST COMPLY WITH SPECIFICATION WSS-M99F9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL "D" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH 1 2 3 4 5 6  
METRIC 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCR/SCH_NAME
DRAWN BY	DATE
CHECKED	SCALE
APPROVED	

P. SCHREIBER 98-04-01 NONE

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN  
 INCHES  MILLIMETERS  
MACHINED DIM. +/-  
ANGULAR DIM. +/-

3RD ANGLE PROJECTION  
STAMPED DIM. +/-

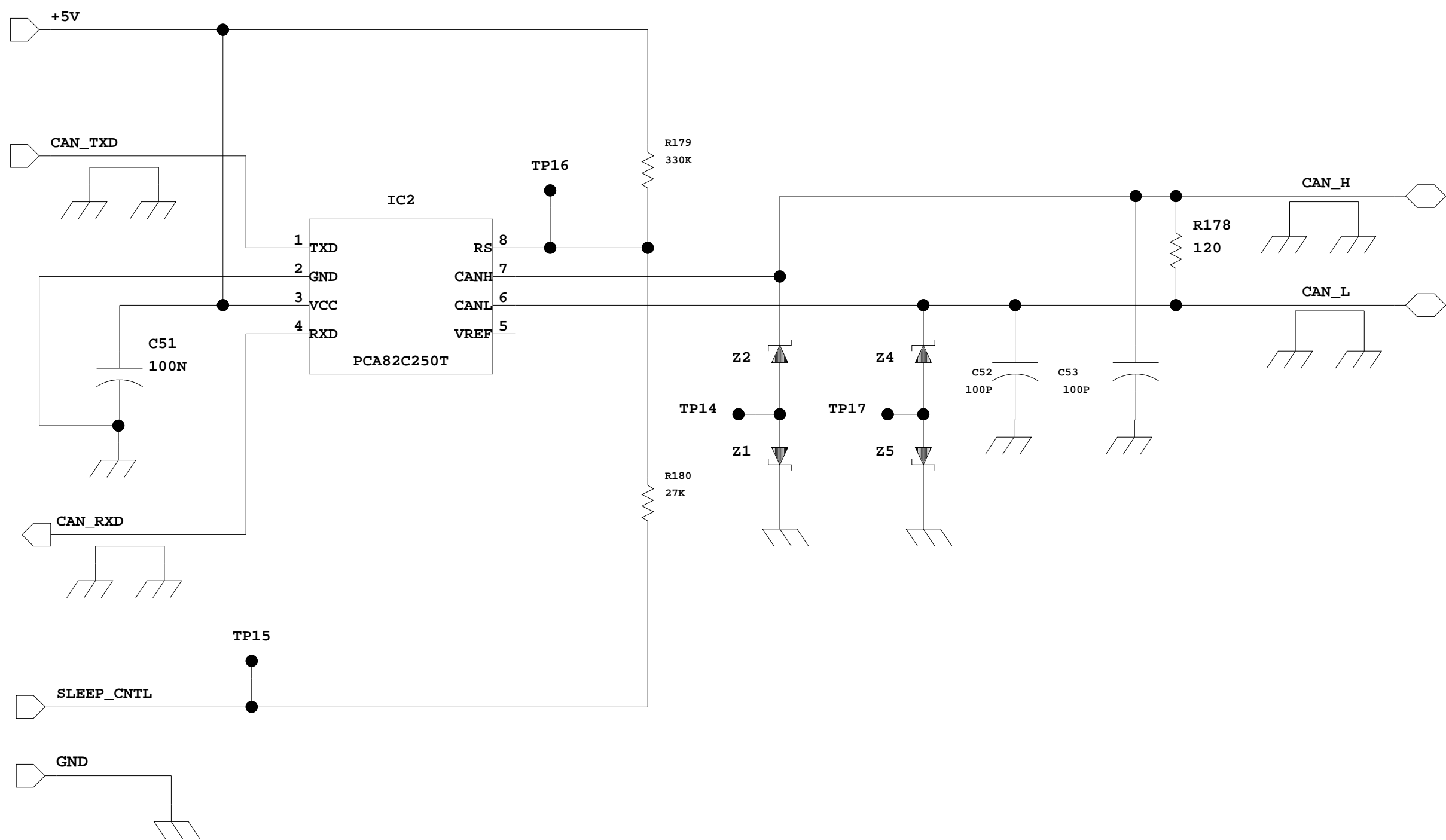
MATERIAL	APP
	DATE

02C05

NAME SKETCH - WIRING DIAGRAM  
SCP DISCRETE PHYSICAL LAYER, LBCC LX3 (LOW XMIT)

NO. VH4X4F-3458-DK

X400 HI Sht 11 SCP



NO. **VH4X4F-3458-DK**

DATE	LET	REVISIONS	CG	MAN	CK	APP
12-07-00		New version of PWB 8375				PVT
02-03-05	2A	New ZIF Connector				PVT

PART MUST COMPLY WITH SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** PRODUCT ENGINEERING

COMPUTER  MANUAL "C" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH 1 2 3 4 5 6  
 METRIC 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCH/SCH_NAME	DRAWN BY	DATE	CHECKED	SCALE	APPROVED
		P. TRASLER	00-08-18	S. PURCELL	NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  INCHES  MILLIMETERS  
 MACHINED DIM. +/- 3RD ANGLE PROJECTION  
 ANGULAR DIM. +/- STAMPED DIM. +/-

MATERIAL	APP
	DATE
	<b>02C05</b>

NAME SKETCH - WIRING DIAGRAM  
 X400 HIGH SERIES

NO. **VH4X4F-3458-DK**

X400 HI Sht 12 CAN POWERVIEW

NO.		VH4X4F-3458-DK				
DATE	LET	REVISIONS	CG	MAN	CK	APP
12-07-00		New version of PWB 8375				FVT
02-03-05	2A	New ZIP Connector				FVT
02-03-11	2C	Components updated to match BOM				FVT
02-03-20	2D	Fiducials updated to match PWB				FVT
02-03-21	2E	Fiducial FID20 changed to PASTEB				FVT

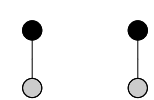
**TDROP1**

Connected to J2-14

**TDROP2**

Connected to J1-13

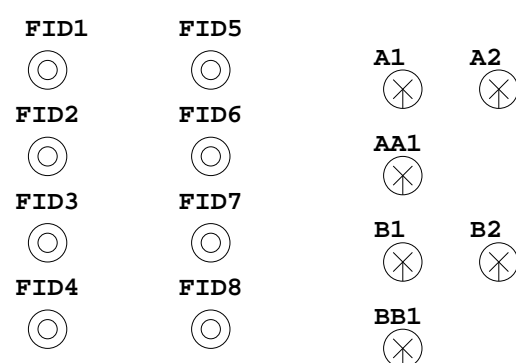
TP7 TP10



NC6 NC7

**ENFIELD MECHANICAL DETAIL**

**MOTHERPANEL DETAIL**



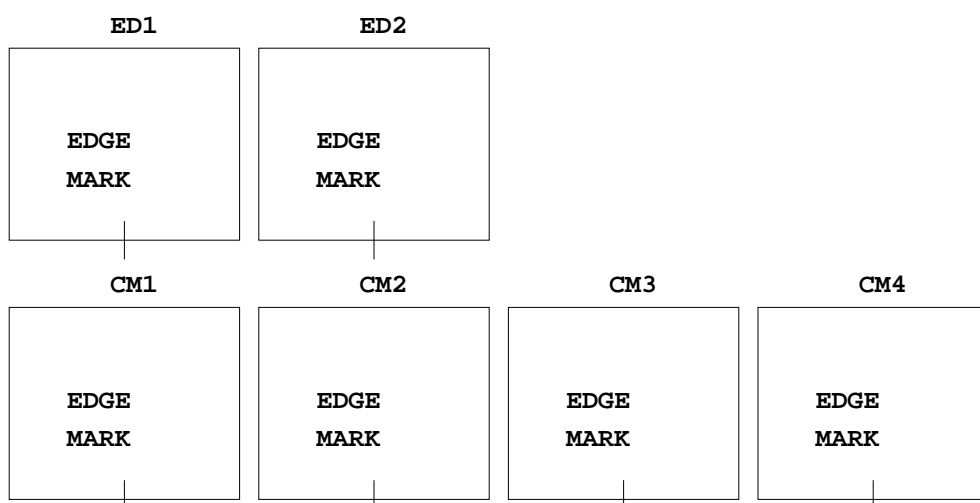
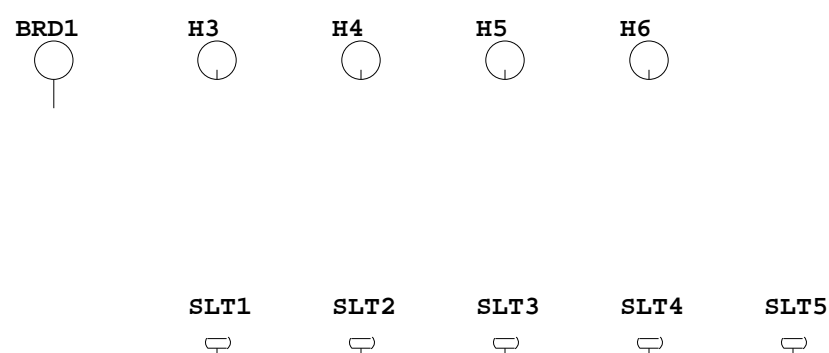
**DAUGHTER BOARD DETAIL**



**GLOBAL FIDUCIALS**



**ADDITIONAL MECHANICAL DATA**



**NOTE: ADDITIONAL MECHANICAL/ELECTRICAL REQUIREMENTS TO BE ADDED TO THIS TABLE.**

PART MUST COMPLY WITH SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** **PRODUCT ENGINEERING**

COMPUTER  MANUAL "C" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH	1	2	3	4	5	6
METRIC	20	30	40	50	60	70

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCH/SCH_NAME			
DRAWN BY	DATE	CHECKED	SCALE	APPROVED
P. TRASLER	00-08-18		NONE	

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN  INCHES  MILLIMETERS  
 MACHINED DIM. +/- 3RD ANGLE PROJECTION  
 ANGULAR DIM. +/- STAMPED DIM. +/-

MATERIAL	APP
	DATE
	02C21

NAME SKETCH - WIRING DIAGRAM  
X400 HIGH SERIES

NO. **VH4X4F-3458-DK**

# PCB COMPONENT HEATSINK DETAILS

IC1A REGULATOR TLE4275

530mm2 on each side of the board  
with evenly space Vias

ROC IC (VAPS)

150mm2 on one side of the board around the 8 central ground pin heat spreaders

BSP75

100mm2 on the grounded tab on one side of the board

## PCB LAYOUT NOTES

IC8 pins 67 (VRH0) and 86 (VRH1) should be routed separately to IC1A pin 5.

NO. VH4X4F-3458-DK						
DATE	LET	REVISIONS	CG	MAN	CK	APP
12-07-00		New version of PWB 8375				PVT
02-03-05	2A	New ZIF Connector				PVT

PART MUST COMPLY WITH SPECIFICATION WSS-M99P9999-A1  
TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

**Visteon** **PRODUCT ENGINEERING**

COMPUTER  MANUAL "C" SIZE

CG COLUMN = GRAPHIC DATA LEVEL ORIGINAL WHEN RED

ENGLISH	1	2	3	4	5	6									
METRIC	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160

DO NOT SCALE ABOVE SCALE FOR REFERENCE ONLY

REF	PROJECT/SCH/SCH_NAME	DATE	CHECKED	SCALE	APPROVED
				NONE	

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN  
 INCHES  MILLIMETERS  
MACHINED DIM. +/- 3RD ANGLE PROJECTION  
ANGULAR DIM. +/- STAMPED DIM. +/-

MATERIAL	APP
	DATE
	02C05

NAME SKETCH - WIRING DIAGRAM  
X400 HIGH SERIES

NO. **VH4X4F-3458-DK**

X400 HI Sht 14 TOP