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Revisions

Rev	Description	Date	Approved
X1	Initial Draft	08/06/13	
A	Release	08/23/13	
A1	DNP J1, J2, J3, J4, J5, J7, J8, J9, J10, J11, J12, J14, TP2 Populate R35, R11, R26, R77, R76-A	12/20/13	

FREEDOM KE06Z

freescale

Automotive, Industrial & Multi-Market Solutions Group
6501 William Cannon Drive West Austin, TX 78735-8598

ICAP Classification: FCP: FIUO: PUBI: X

Designer:	Drawing Title: FRDM-KE06Z	
Drawn by:	Page Title: TITLE PAGE	
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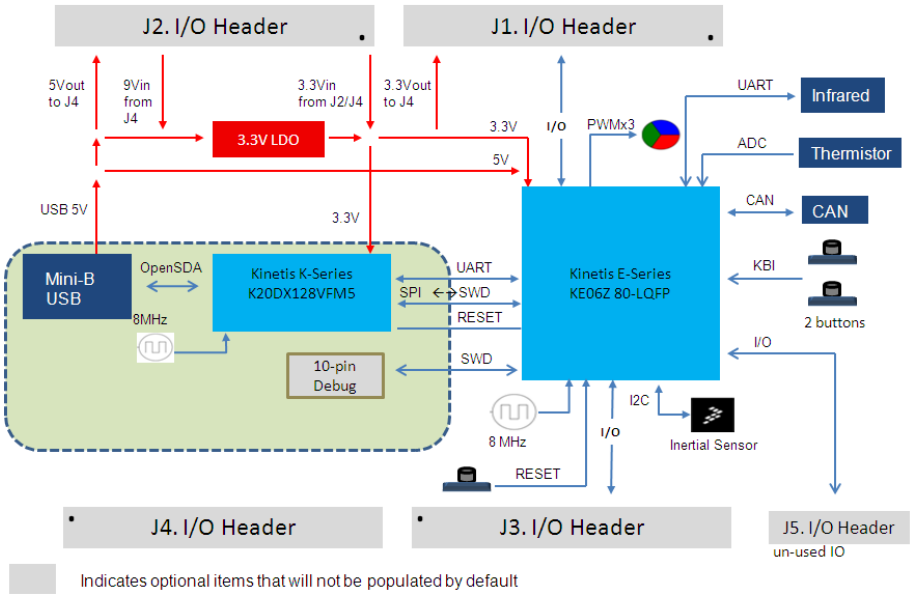

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Drawing Title: **FRDM-KE06Z**

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Multiple Used Pin

PTB1_IRTX — R14 0 — PTB1
(pg5) PTB1_D1 — R15 0 DNP

PTA1_IRRX — R51 0 — PTA1
(pg5) PTA1_D4_T1 — R50 0

(pg5) PTA2_ACCEL_SDA — R45 0 — PTA2
(pg5) PTA2_D14 — R47 0 DNP

(pg5) PTA3_ACCEL_SCL — R42 0 — PTA3
(pg5) PTA3_D15 — R39 0 DNP

(pg5) PTB4_D12 — R20 0 DNP — PTB4
(pg5) PTB4_D6_PWM4 — R21 0

(pg4) UART1_RX_TGTMCU — 1K R53 — PTC6
(pg5) PTC6_RXD1 — R78 0

(pg4) UART1_TX_TGTMCU — 1K R52 — PTC7
(pg5) PTC7_TXD1 — R79 0

(pg5) CAN_TX — R72 0 — PTE7
(pg5) PTE7_CONN — R73 0 DNP

(pg5) CAN_RX — R74 0 — PTH2
(pg5) PTH2_CONN — R75 0 DNP

When 5V for KE06Z, R45, R42, R52, R72 and R74 must be DNP.
As these connected pins are not 5V compatible.

VDD_KE06Z
C22 1.0UF, C21 0.1UF, C24 1.0UF, C23 0.1UF, C32 1.0UF, C31 0.1UF
GND

VDD_KE06Z — R62 0 — VDDA
C34 0.1UF, C33 1.0UF — GND

VDD_KE06Z — R59 0 — VREFH
R34 0 DNP — AREF (pg5)
C20 1.0UF, C19 0.1UF — GND

CAD NOTE:
Please place these capacitors near their respective CPU pin VDD

U3

VDD1 (8), VDD2 (40), VDD3 (49)
VDDA/VREFH (9), VSSA/VSS1 (12)
VREFH (10), VREFL (11)

(pg5) PTA0_D8_T0 — 62 PTA0/KBI0P0/FTM0CH0/SCL0_OUT/ACMP0_IN0/ADPC0
PTA1 — 61 PTA1/KBI0P1/FTM0CH1/SDA0_OUT/ACMP0_IN1/ADPC1
PTA2 — 60 PTA2/KBI0P2/RX0/SDA0
PTA3 — 59 PTA3/KBI0P3/TX0/SCL0
(pg3,4) SWD_DIO_TGTMCU — 80 PTA4/KBI0P4/ACMP0_OUT/SWDIO
(pg3,4,5) RST_TGTMCU — 79 PTA5/KBI0P5/IRQ/TCLK0/RESET
(pg5) PTA6_ANB0 — 46 PTA6/KBI0P6/FTM2FLT1/ACMP1_IN0/ADPC2
(pg5) PTA7_D7_ANB1 — 45 PTA7/KBI0P7/FTM2FLT2/ACMP1_IN1/ADPC3

(pg5) PTB0_D0 — 42 PTB0/KBI0P8/RX0/PWTIN1/ADPC4
PTB1 — 41 PTB1/KBI0P9/TX0/ADPC5
(pg5) PTB2_D13_T3 — 40 PTB2/KBI0P10/SCK0/FTM0CH0/ADPC6
(pg5) PTB3_D11_ANB2 — 39 PTB3/KBI0P11/MOSI0/FTM0CH1/ADPC7
PTB4 — 23 PTB4/KBI0P12/FTM2CH4/MISO0/NMI/ACMP1_IN2
(pg5) PTB5_D10_PWM5 — 22 PTB5/KBI0P13/FTM2CH5/SS0/ACMP1_OUT
XTAL — 14 PTB6/KBI0P14/SDA0/XTAL
EXTAL — 13 PTB7/KBI0P15/SCL0/EXTAL

XTAL_Y — R31 0 — XTAL
1.0M R33 — EXTAL
8MHZ
C16 22PF — GND GND
C17 22PF — GND

(pg5) PTC0_A1 — 32 PTC0/KBI0P16/FTM2CH0/ADPC8
(pg5) PTC1_A2_PWM1 — 31 PTC1/KBI0P17/FTM2CH1/ADPC9
(pg5) PTC2_A3 — 25 PTC2/KBI0P18/FTM2CH2/ADPC10
(pg5) PTC3_A4 — 24 PTC3/KBI0P19/FTM2CH3/ADPC11
(pg3,5) PTC4_SWD_CLK_GPIO8 — 78 PTC4/KBI0P20/RTCO/FTM1CH0/ACMP0_IN2/SWCLK
(pg5) PTC5_T2 — 77 PTC5/KBI0P21/FTM1CH1/RTCO
PTC6 — 64 PTC6/KBI0P22/RX1/CAN_RX
PTC7 — 63 PTC7/KBI0P23/TX1/CAN_TX

(pg5) PTD0_D3_PWM2 — 2 PTD0/KBI0P24/FTM2CH2/SCK1
(pg5) PTD1_D5_PWM3 — 1 PTD1/KBI0P25/FTM2CH3/MOSI1
(pg5) PTD2_SPI1_MISO — 58 PTD2/KBI0P26/MISO1
(pg5) PTD3_ACCEL_INT2 — 57 PTD3/KBI0P27/SS1
(pg5) PTD4_ACCEL_INT1 — 56 PTD4/KBI0P28
(pg5) PTD5_D2 — 28 PTD5/KBI0P29/PWTIN0
(pg5) PTD6_RXD2 — 27 PTD6/KBI0P30/RX2
(pg5) PTD7_TXD2 — 26 PTD7/KBI0P31/TX2

PTE0/KBI1P0/SCK0/TCLK1/SDA1 — 76 — PTE0_SPI0_SCK (pg5)
PTE1/KBI1P1/MOSI0/SCL1 — 75 — PTE1_SPI0_MOSI (pg5)
PTE2/KBI1P2/MISO0/PWTIN0 — 68 — PTE2_SPI0_MISO (pg5)
PTE3/KBI1P3/SS0 — 67 — PTE3_SPI0_SS (pg5)
PTE4/KBI1P4 — 47 — PTE4_GPIO1 (pg5)
PTE5/KBI1P5 — 21 — PTE5_LED3 (pg5)
PTE6/KBI1P6 — 20 — PTE6_LED2 (pg5)
PTE7/KBI1P7/TCLK2/FTM1CH1/CAN_TX — 6 — PTE7

PTF0/KBI1P8/FTM2CH0 — 55 — PTF0_GPIO3 (pg5)
PTF1/KBI1P9/FTM2CH1 — 54 — PTF1_GPIO2 (pg5)
PTF2/KBI1P10/RX1 — 44 — PTF2_LED6 (pg5)
PTF3/KBI1P11/TX1 — 43 — PTF3_LED5 (pg5)
PTF4/KBI1P12/ADPC12 — 38 — PTF4_THER
PTF5/KBI1P13/ADPC13 — 37 — PTF5_THER
PTF6/KBI1P14/ADPC14 — 36
PTF7/KBI1P15/ADPC15 — 35 — PTF6_A5_ANA1 (pg4,5)
PTF7_A0_ANA0 (pg5)

PTG0/KBI1P16 — 74 — PTG0_GPIO7 (pg5)
PTG1/KBI1P17 — 73 — PTG1_GPIO6 (pg5)
PTG2/KBI1P18 — 72 — PTG2_GPIO5 (pg5)
PTG3/KBI1P19 — 71 — PTG3_GPIO4 (pg5)
PTG4/KBI1P20/FTM2CH2/SCK1 — 53 — PTG4 (pg5)
PTG5/KBI1P21/FTM2CH3/MOSI1 — 52 — PTG5_RED
PTG6/KBI1P22/FTM2CH4/MISO1 — 51 — PTG6_GREEN
PTG7/KBI1P23/FTM2CH5/SS1 — 50 — PTG7_BLUE

PTH0/KBI1P24/FTM2CH0 — 19 — PTH0_D9_PWM0 (pg5)
PTH1/KBI1P25/FTM2CH1 — 18 — PTH1 (pg5)
PTH2/KBI1P26/BUSOUT/FTM1CH0/CAN_RX — 7 — PTH2
PTH3/KBI1P27/SDA1 — 34 — PTH3_KEY1 (pg5)
PTH4/KBI1P28/SCL1 — 33 — PTH4_KEY2 (pg5)
PTH5/KBI1P29 — 5 — PTH5 (pg5)
PTH6/KBI1P30 — 4 — PTH6_GPIO10 (pg5)
PTH7/KBI1P31/PWTIN1 — 3 — PTH7_GPIO9 (pg5)

PTI0/IRQ/RX2 — 17 — PTI0 (pg5)
PTI1/IRQ/TX2 — 16 — PTI1 (pg5)
PTI2/IRQ — 66 — PTI2 (pg5)
PTI3/IRQ — 65 — PTI3 (pg5)
PTI4/IRQ — 15 — PTI4 (pg5)
PTI5/IRQ — 30 — PTI5 (pg5)
PTI6/IRQ — 29 — PTI6 (pg5)

VSS2 (69), VSS3 (48) — GND

PKE06Z128VLK4

KINETIS KE06Z MCU

RGB LED FEATURE

PTG5_RED — R46 220 — LEDRGB_RED — TP12
D4
VDD_PERIPH
LEDRGB_GREEN — R40 220 — PTG6_GREEN — TP7
LEDRGB_BLUE — R43 220 — PTG7_BLUE — TP8
CLV1A-FKB-CJ1M1F1BB7R4S3

SWD CONNECTOR

(pg3,4) SWD_DIO_TGTMCU — R58 0 — PTC4_SWD_CLK_GPIO8 (pg3,5)
VDD_KE06Z
J7
SWD_CLK_TGTMCU (pg4)
RST_TGTMCU (pg3,4,5)
GND
HDR 2X5
DNP

INFRARED PORT

VDD_PERIPH
TP21 — PTA1_IRRX — R2 1K — R8 22K — Q1 PT12-21C/TR8 — C1 1000PF — GND
RX

TP22 — PTB1_IRTX — D1 IR12-21C/TR8 — R1 470 — GND
TX

THERMISTOR

VDD_PERIPH
R9 4.99K
90C to -20C
When VDD_PERIPH = 3.3V
Vdiff ~ 0.372V to 2.879V
(Ta=25C 1.650V)
When VDD_PERIPH = 5.0V
Vdiff ~ 0.564V to 4.362V
(Ta=25C 2.50V)
THER_A — C12 0.1UF — RT1 10K — THER_B — R10 4.99K
PTF4_THER — R22 100
PTF5_THER — R23 100
C13 2200PF, C14 2200PF
GND

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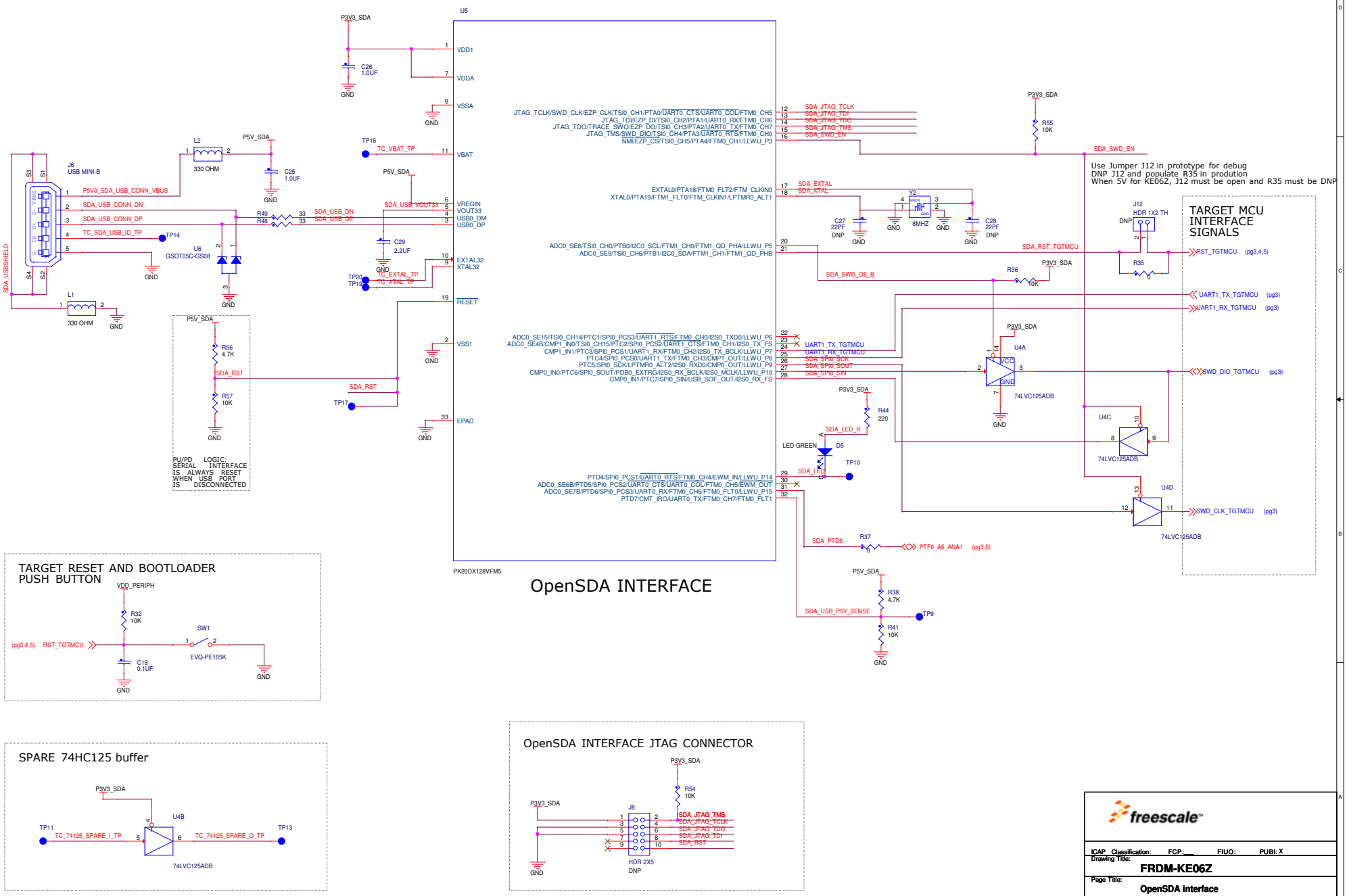
U5
PK20DX128VFM5
OpenSDA INTERFACE
J6
USB MINI-B
U6
GSOT05C-GS08
L1
330 OHM
L2
330 OHM
Y2
8MHZ
J12
HDR 1X2 TH
DNP
TARGET MCU INTERFACE SIGNALS
RST_TGTMCU (pg3,4,5)
UART1_TX_TGTMCU (pg3)
UART1_RX_TGTMCU (pg3)
SWD_DIO_TGTMCU (pg3)
SWD_CLK_TGTMCU (pg3)
74LVC125ADB
Use Jumper J12 in prototype for debug
DNP J12 and populate R35 in prodution
When 5V for KE06Z, J12 must be open and R35 must be DNP
PU/PD LOGIC:
SERIAL INTERFACE
IS ALWAYS RESET
WHEN USB PORT
IS DISCONNECTED
TARGET RESET AND BOOTLOADER PUSH BUTTON
EVQ-PE105K
SPARE 74HC125 buffer
OpenSDA INTERFACE JTAG CONNECTOR
HDR 2X5
DNP
ICAP Classification:
FCP:
FIUO:
PUBI: X
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OpenSDA interface
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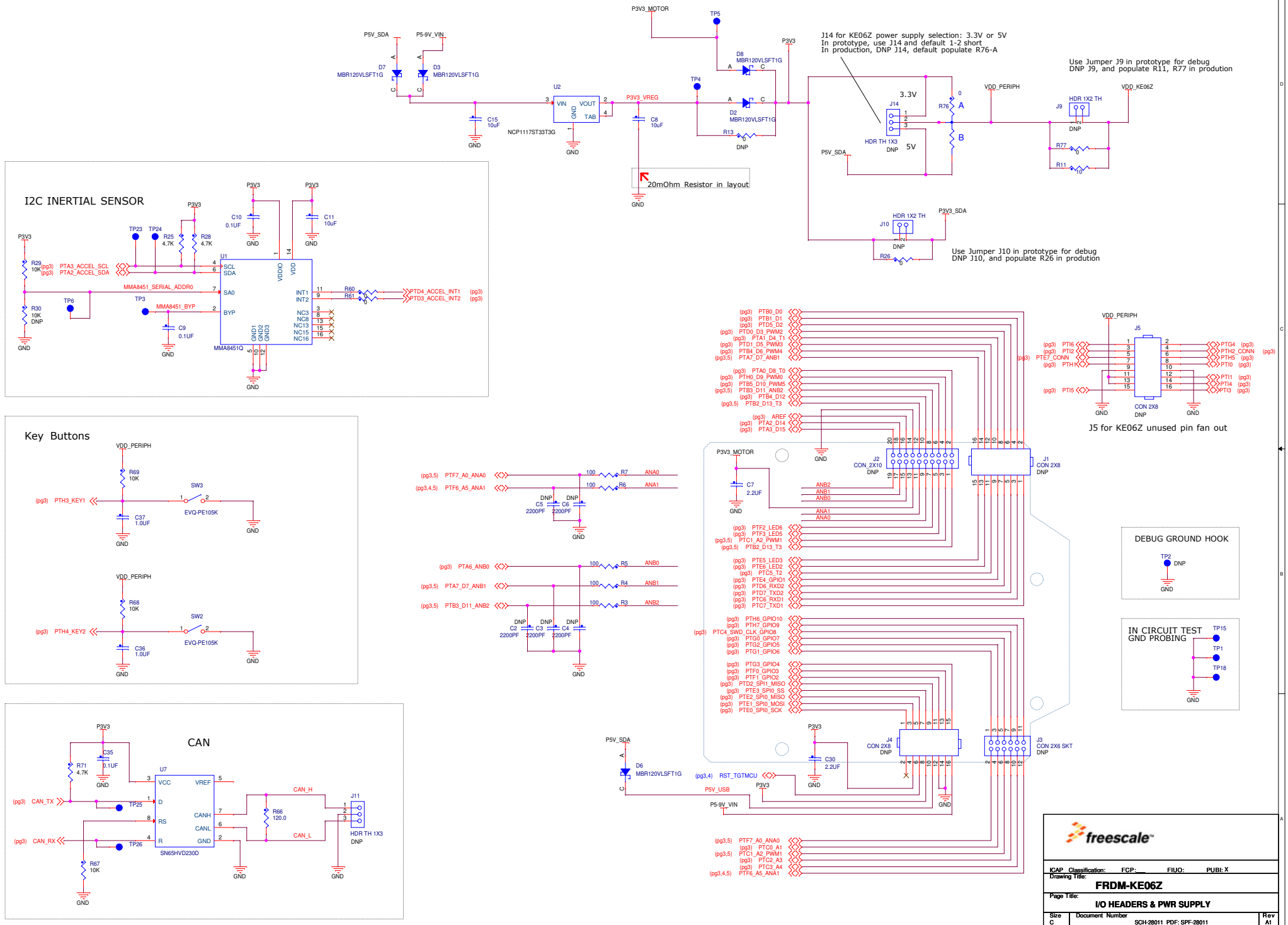
P3V3_MOTOR
TP5
P5V_SDA
P5-9V_VIN
D7 MBR120VLSFT1G
D3 MBR120VLSFT1G
D8 MBR120VLSFT1G
D2 MBR120VLSFT1G
U2
NCP1117ST33T3G
VIN
VOUT
GND
TAB
C15 10uF
C8 10uF
P3V3_VREG
TP4
R13 0 DNP
P3V3
J14 for KE06Z power supply selection: 3.3V or 5V
In prototype, use J14 and default 1-2 short
In production, DNP J14, default populate R76-A
3.3V
5V
J14
HDR TH 1X3 DNP
R76 0
A
B
VDD_PERIPH
VDD_KE06Z
Use Jumper J9 in prototype for debug
DNP J9, and populate R11, R77 in prodution
J9
HDR 1X2 TH
DNP
R77 0
R11 10
20mOhm Resistor in layout
J10
HDR 1X2 TH
DNP
R26 0
P3V3_SDA
Use Jumper J10 in prototype for debug
DNP J10, and populate R26 in prodution
I2C INERTIAL SENSOR
P3V3
C10 0.1UF
C11 10uF
TP23
TP24
R25 4.7K
R28 4.7K
R29 10K DNP
R30 10K DNP
TP6
TP3
MMA8451_SERIAL_ADDR0
MMA8451_BYP
C9 0.1UF
U1
MMA8451Q
SCL
SDA
SA0
BYP
VDDIO
VDD
INT1
INT2
NC3
NC8
NC13
NC15
NC16
GND1
GND2
GND3
R60 0
R61 0
PTA3_ACCEL_SCL
PTA2_ACCEL_SDA
PTD4_ACCEL_INT1
PTD3_ACCEL_INT2
Key Buttons
VDD_PERIPH
R69 10K
SW3
PTH3_KEY1
C37 1.0UF
EVQ-PE105K
R68 10K
SW2
PTH4_KEY2
C36 1.0UF
PTA7_D7_ANB1
PTB3_D11_ANB2
PTA6_ANB0
R7 100 ANA0
R6 100 ANA1
R5 100 ANB0
R4 100 ANB1
R3 100 ANB2
C5 2200PF
C6 2200PF
C2 2200PF
C3 2200PF
C4 2200PF
DNP
CAN
C35 0.1UF
R71 4.7K
U7
SN65HVD230D
VCC
VREF
D
RS
CANH
CANL
R
GND
CAN_TX
CAN_RX
TP25
TP26
R67 10K
R66 120.0
CAN_H
CAN_L
J11
HDR TH 1X3 DNP
P5V_SDA
D6 MBR120VLSFT1G
P5V_USB
P5-9V_VIN
RST_TGTMCU
C30 2.2UF
C7 2.2UF
J2 CON_2X10 DNP
J1 CON 2X8 DNP
J4 CON 2X8 DNP
J3 CON 2X6 SKT DNP
ANB2
ANB1
ANB0
ANA1
ANA0
J5
CON 2X8 DNP
J5 for KE06Z unused pin fan out
DEBUG GROUND HOOK
TP2
DNP
IN CIRCUIT TEST
GND PROBING
TP15
TP1
TP18
freescale
ICAP Classification:
FCP:
FIUO:
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