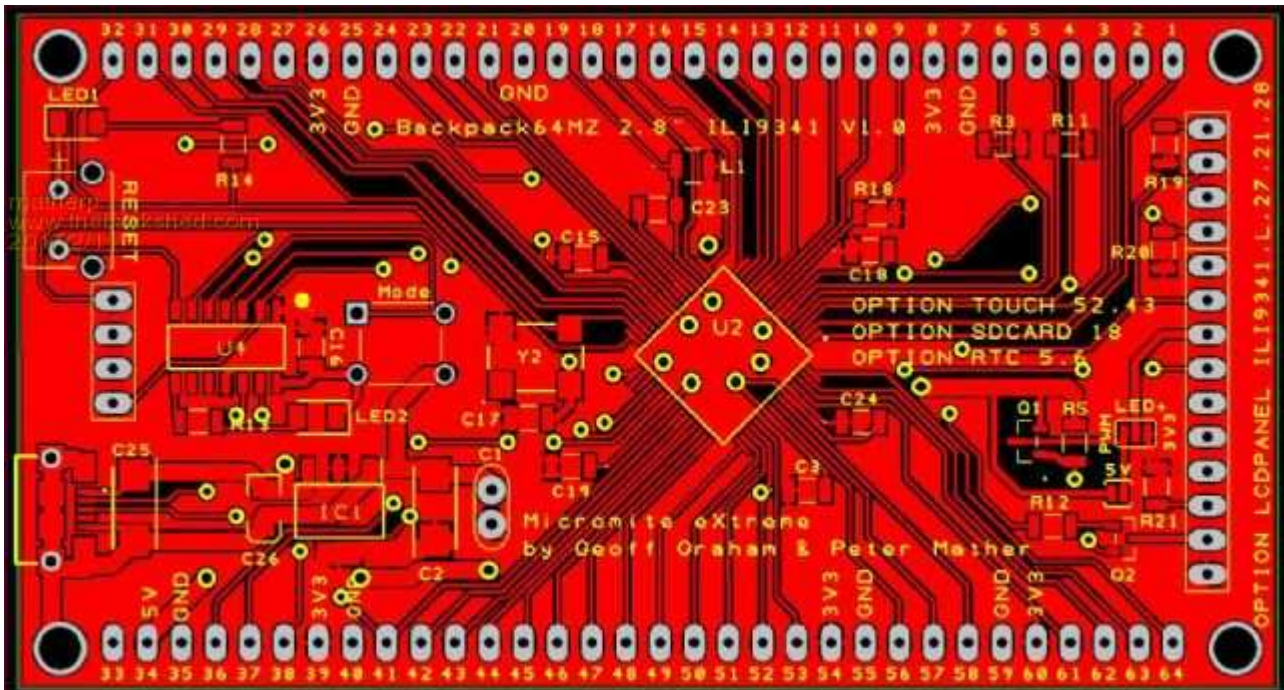## Peter Mather MMX64

I originally dropped support for the 64-pin MZ chip as it was proving increasingly difficult to reconcile the additional functionality in the 100-pin eXtreme with the limited pin count on the 64-pin MZ whilst also trying to maintain some pin compatibility with the 64-pin MM+.

However, now the MZ code is reasonably stable I decided to revisit this and have created a fork of the code specifically for the 64-pin chip.

2017-02-11_151415_MMX64V5.3.04.zip

This has a ground-up pin allocation to get the best usage of the chip with minimum overlap of special functions.

The eXtreme64 does have some reduced functionality compared to the 100 and 144-pin code-set.

Only one I2C port
Only two SPI ports
No VGA support
No 16-bit parallel SSD1963 support

Otherwise everything in the 100/144 pin versions is there and works identically.

The question is what sort of PCB would suit? I've designed a 2.8" ILI9341 sized board as above and the prototypes of this are on order. Hopefully WhiteWizard will add this board to his portfolio 🤭 but I'll release gerbers as soon as the design is checked out. Because the PCBs are

comparatively small (93.5mm x 50mm) they are also cheap - USD23 for 10 including shipping to the UK.

The board is powered through the micro-USB connector which also acts as the console via a PIC16F1455 with the USB/UART/Programmer code installed. The PCB is on a 0.1" grid and can be plugged directly into a breadboard for connecting additional components. The 2.8" ILI9341 TFT display, if fitted, mounts over the top of the components on the board and provides the SDcard slot. Every pin on the 64-pin MZ is broken out in the expected order. The bottom of the PCB is silk-screened with full details of the special function uses of each pin as below.

Other than the console, there is no on-board functionality provided except for transistors to allow for PWM control of the TFT backlight.

SMD components are chosen to be easy to hand solder (1206, SOIC, 7x5 oscillator).

Quote:

```
RE5 1 SSD5 Analog
RE6 2 SSD6 Analog
RE7 3 SSD7 Analog
RG6 4 SPI2CLK Analog
RG7 5 I2CSDA Analog
RG8 6 I2CCLK Analog
RG9 10 PWM1C Analog
RB5 11 COUNT3 Analog
RB4 12 KBDCLK Analog
RB3 13 COM2RX Analog
RB2 14 COUNT1 Analog
RB1 15 COUNT4/IR Analog
RB0 16 COUNT2 Analog
RB6 17 COM1EN Analog
RB7 18 PWM2B Analog
RB8 21 SSD_RESET Analog
RB9 22 COM1RX Analog
RB10 23 COM2TX Analog
RB11 24 KYBDAT Analog
RB12 27 SSD_RS Analog
RB13 28 SSD_WR Analog
RB14 29 COM3TX Analog
RB15 30 COM3RX Analog
RC15 32 Heartbeat
RF4 41 SPI2OUT 5V
RF5 42 COM1TX 5V
RD9 43 MOUSECLK 5V
RD10 44 PWM2A 5V
RD11 45 PWM2C/TONE_L 5V
RD0 46 PWM1B 5V
RC13 47 SPI2IN
RC14 48 PWM1A
RD1 49 SPICLK 5V
RD2 50 SPIIN 5V
RD3 51 SPIOUT 5V
RD4 52 MOUSEDAT 5V
RD5 53 TONE_R 5V
RF0 56 COM4TX 5V
RF1 57 COM4RX 5V
RE0 58 SSD0 5V
RE1 61 SSD1 5V
RE2 62 SSD2 5V
RE3 63 SSD3 5V
RE4 64 SSD4 Analog
```

BOM

PIC32MZ2048EFH064-250I/PT - preferred option
PIC32MZ2048EFH064/PT
PIC32MZ2048EFG064/PT - cheapest option
PIC32MZ2048EFM064/PT

Full BOM as follows:

Capacitor 1206 0.1uF * 8
Capacitor 1206 1uF * 1
Capacitor 1206 22uF * 1
Capacitor ceramic 1uF 2.5mm lead pitch * 1
Capacitor Tantalum 100uF * 2 e.g. TR3C107K010C0100
Resistor 1206 10K * 6
Resistor 1206 4K7 * 1
Resistor 1206 1K0 * 1
Resistor 1206 330R * 2
LED 1206 * 2 e.g. KPTD-3216SRC-PRV
Inductor 1206 * 1 e.g. Murata LQM31PN1R0M00L
npn Transistor SOT23 * 1 e.g. BC817-40
p-channel mosfet SOT23 * 1 e.g. IRLML6402TRPBF
PCB switch Tyco 1825967-2 * 1
PCB switch Tyco FSMRA4JH * 1
Micro-USB connector Amphenol FCI 10118192-0001LF * 1
PIC16F1454-I_SL * 1
Oscillator 24MHz 7x5mm * 1 e.g. SG8002CAPCB24MHZ
3.3V LDO regulator * 1 e.g. LD1117S33CTR