

Cortex-M0+较 M0 内核来说到底“+”了什么？

在本视频中，飞思卡尔工程师介绍了基于 Cortex-M0+内核的 Kinetis L 系列芯片较 M0 内核在能耗方面的改进和增加的一些功能，本视频内容如下：

业界能效最高的 32 位处理器

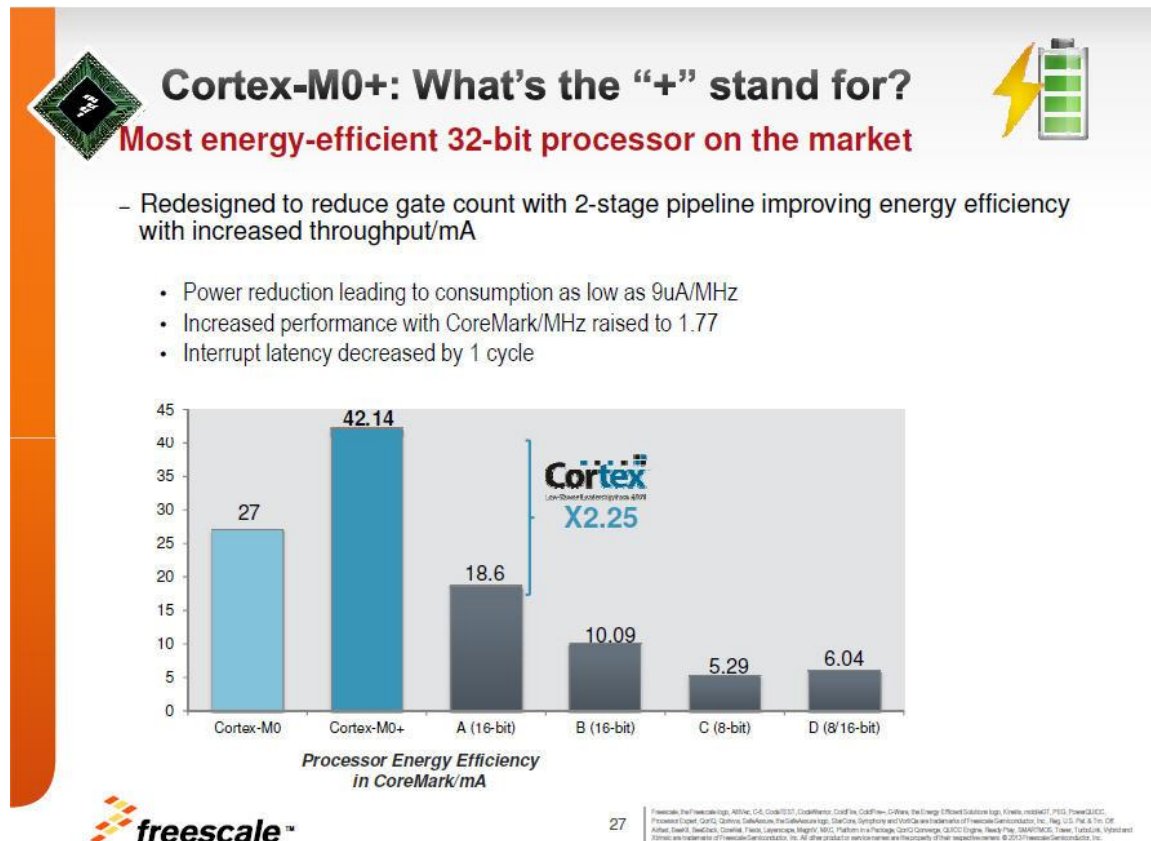
为了增强功耗表现使其每毫安处理能力提高，减少了门数量并重新设计了这款具有两级流水线的 M0+内核。

功率的消耗降到尽可能低的 9uA/MHz

性能提升至 1.77CoreMark/MHz

中断等待时间比 M0 减少了 1 个 cycle

这三项显著降低了处理器的运行时间，使其有更多时间处于 deep sleep 模式中从而延长了供电电池的使用寿命。



单周期访问的快速 IO 口更易于 bit-banging 和软件模拟仿真，使得模拟 IIC、SPI 这种协议的通信时钟更快。

较普通 IO 口快了 50%

快速 GPIO 控制器(FGPIO)对于所有引脚可进行置 1、清 0、翻转操作。

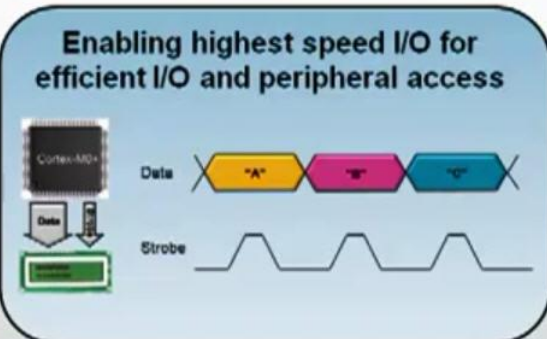
用于改善用户调试体验的片上 micro trace buffer (MTB)

优化的捕获机制只在用户配置的系统 RAM 中存储程序流信息的变化。


Cortex-M0+: What's the "+" for?

- **Extended system-level capabilities**
 - Single-cycle fast I/O access port facilitates bit-banging and software protocol emulation, keeping an 8-bit 'look and feel'
 - Up to 50% faster than normal I/O
 - On-chip micro trace buffer (MTB) improves user debug experience
 - Optimized capture mechanism only stores change of program flow information in user configured system RAM
 - Large program sequence can be reconstructed by debugger using the MTB contents and application source code

Enabling highest speed I/O for efficient I/O and peripheral access



Bringing powerful, easy to use debug capabilities to a low cost device



freescaler

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支持向量表重定位

允许将中断向量表重定位到 RAM 中，使得中断在 flash 编译的时候仍可继续执行。

存储器保护单元 (MPU)

可选配的安全组件用于保护操作系统和关键数据的安全。

User/Privilege 模式支持

Privilege 模式下对外设访问有更多的保护。

User 模式下限制了一些指令。

Cortex-M0+: What's the “+” for?

- Extended system-level capabilities**
 - Vector table relocation support
 - Enables relocation to system RAM for continued execution while flash is being re-programmed
 - Memory Protection Unit (MPU) component
 - Optional component useful for safety related applications to protect OS and critical data/peripherals from unauthorized access
- User/Privilege mode support
 - Further protects peripherals accessible only in privilege mode
 - Restricts some instructions in user mode

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FreeScale, the FreeScale logo, i.MX, i.MX2, i.MX27, i.MX270, i.MX271, i.MX272, i.MX273, i.MX274, i.MX275, i.MX276, i.MX277, i.MX278, i.MX279, i.MX280, i.MX281, i.MX282, i.MX283, i.MX284, i.MX285, i.MX286, i.MX287, i.MX288, i.MX289, i.MX290, i.MX291, i.MX292, i.MX293, i.MX294, i.MX295, i.MX296, i.MX297, i.MX298, i.MX299, i.MX300, i.MX301, i.MX302, i.MX303, i.MX304, i.MX305, i.MX306, i.MX307, i.MX308, i.MX309, i.MX310, i.MX311, i.MX312, i.MX313, i.MX314, i.MX315, i.MX316, i.MX317, i.MX318, i.MX319, i.MX320, i.MX321, i.MX322, i.MX323, i.MX324, i.MX325, i.MX326, i.MX327, i.MX328, i.MX329, i.MX330, i.MX331, i.MX332, i.MX333, i.MX334, i.MX335, i.MX336, i.MX337, i.MX338, i.MX339, i.MX340, i.MX341, i.MX342, i.MX343, i.MX344, i.MX345, i.MX346, i.MX347, i.MX348, i.MX349, i.MX350, i.MX351, i.MX352, i.MX353, i.MX354, i.MX355, i.MX356, i.MX357, i.MX358, i.MX359, i.MX360, i.MX361, i.MX362, i.MX363, i.MX364, i.MX365, i.MX366, i.MX367, i.MX368, i.MX369, i.MX370, i.MX371, i.MX372, i.MX373, i.MX374, i.MX375, i.MX376, i.MX377, i.MX378, i.MX379, i.MX380, i.MX381, i.MX382, i.MX383, i.MX384, i.MX385, i.MX386, i.MX387, i.MX388, i.MX389, i.MX390, i.MX391, i.MX392, i.MX393, i.MX394, i.MX395, i.MX396, i.MX397, i.MX398, i.MX399, i.MX400, i.MX401, i.MX402, i.MX403, i.MX404, i.MX405, i.MX406, i.MX407, i.MX408, i.MX409, i.MX410, i.MX411, i.MX412, i.MX413, i.MX414, i.MX415, i.MX416, i.MX417, i.MX418, i.MX419, i.MX420, i.MX421, i.MX422, i.MX423, i.MX424, i.MX425, i.MX426, i.MX427, i.MX428, i.MX429, i.MX430, i.MX431, i.MX432, i.MX433, i.MX434, i.MX435, i.MX436, i.MX437, i.MX438, i.MX439, i.MX440, i.MX441, i.MX442, i.MX443, i.MX444, i.MX445, i.MX446, i.MX447, i.MX448, i.MX449, i.MX450, i.MX451, i.MX452, i.MX453, i.MX454, i.MX455, i.MX456, i.MX457, i.MX458, i.MX459, i.MX460, i.MX461, i.MX462, i.MX463, i.MX464, i.MX465, i.MX466, i.MX467, i.MX468, i.MX469, i.MX470, i.MX471, i.MX472, i.MX473, i.MX474, i.MX475, i.MX476, i.MX477, i.MX478, i.MX479, i.MX480, i.MX481, i.MX482, i.MX483, i.MX484, i.MX485, i.MX486, i.MX487, i.MX488, i.MX489, i.MX490, i.MX491, i.MX492, i.MX493, i.MX494, i.MX495, i.MX496, i.MX497, i.MX498, i.MX499, i.MX500, i.MX501, i.MX502, i.MX503, i.MX504, i.MX505, i.MX506, i.MX507, i.MX508, i.MX509, i.MX510, i.MX511, i.MX512, i.MX513, i.MX514, i.MX515, i.MX516, i.MX517, i.MX518, i.MX519, i.MX520, i.MX521, i.MX522, i.MX523, i.MX524, i.MX525, i.MX526, i.MX527, i.MX528, i.MX529, i.MX530, i.MX531, i.MX532, i.MX533, i.MX534, i.MX535, i.MX536, i.MX537, i.MX538, i.MX539, i.MX540, i.MX541, i.MX542, i.MX543, i.MX544, i.MX545, i.MX546, i.MX547, i.MX548, i.MX549, i.MX550, i.MX551, i.MX552, i.MX553, i.MX554, i.MX555, i.MX556, i.MX557, i.MX558, i.MX559, i.MX560, i.MX561, i.MX562, i.MX563, i.MX564, i.MX565, i.MX566, i.MX567, i.MX568, i.MX569, i.MX570, i.MX571, i.MX572, i.MX573, i.MX574, i.MX575, i.MX576, i.MX577, i.MX578, i.MX579, i.MX580, i.MX581, i.MX582, i.MX583, i.MX584, i.MX585, i.MX586, i.MX587, i.MX588, i.MX589, i.MX590, i.MX591, i.MX592, i.MX593, i.MX594, i.MX595, i.MX596, i.MX597, i.MX598, i.MX599, i.MX600, i.MX601, i.MX602, i.MX603, i.MX604, i.MX605, i.MX606, i.MX607, i.MX608, i.MX609, i.MX610, i.MX611, i.MX612, i.MX613, i.MX614, i.MX615, i.MX616, i.MX617, i.MX618, i.MX619, i.MX620, i.MX621, i.MX622, i.MX623, i.MX624, i.MX625, i.MX626, i.MX627, i.MX628, i.MX629, i.MX630, i.MX631, i.MX632, i.MX633, i.MX634, i.MX635, i.MX636, i.MX637, i.MX638, i.MX639, i.MX640, i.MX641, i.MX642, i.MX643, i.MX644, i.MX645, i.MX646, i.MX647, i.MX648, i.MX649, i.MX650, i.MX651, i.MX652, i.MX653, i.MX654, i.MX655, i.MX656, i.MX657, i.MX658, i.MX659, i.MX660, i.MX661, i.MX662, i.MX663, i.MX664, i.MX665, i.MX666, i.MX667, i.MX668, i.MX669, i.MX670, i.MX671, i.MX672, i.MX673, i.MX674, i.MX675, i.MX676, i.MX677, i.MX678, i.MX679, i.MX680, i.MX681, i.MX682, i.MX683, i.MX684, i.MX685, i.MX686, i.MX687, i.MX688, i.MX689, i.MX690, i.MX691, i.MX692, i.MX693, i.MX694, i.MX695, i.MX696, i.MX697, i.MX698, i.MX699, i.MX700, i.MX701, i.MX702, i.MX703, i.MX704, i.MX705, i.MX706, i.MX707, i.MX708, i.MX709, i.MX710, i.MX711, i.MX712, i.MX713, i.MX714, i.MX715, i.MX716, i.MX717, i.MX718, i.MX719, i.MX720, i.MX721, i.MX722, i.MX723, i.MX724, i.MX725, i.MX726, i.MX727, i.MX728, i.MX729, i.MX730, i.MX731, i.MX732, i.MX733, i.MX734, i.MX735, i.MX736, i.MX737, i.MX738, i.MX739, i.MX740, i.MX741, i.MX742, i.MX743, i.MX744, i.MX745, i.MX746, i.MX747, i.MX748, i.MX749, i.MX750, i.MX751, i.MX752, i.MX753, i.MX754, i.MX755, i.MX756, i.MX757, i.MX758, i.MX759, i.MX760, i.MX761, i.MX762, i.MX763, i.MX764, i.MX765, i.MX766, i.MX767, i.MX768, i.MX769, i.MX770, i.MX771, i.MX772, i.MX773, i.MX774, i.MX775, i.MX776, i.MX777, i.MX778, i.MX779, i.MX780, i.MX781, i.MX782, i.MX783, i.MX784, i.MX785, i.MX786, i.MX787, i.MX788, i.MX789, i.MX790, i.MX791, i.MX792, i.MX793, i.MX794, i.MX795, i.MX796, i.MX797, i.MX798, i.MX799, i.MX800, i.MX801, i.MX802, i.MX803, i.MX804, i.MX805, i.MX806, i.MX807, i.MX808, i.MX809, i.MX810

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