

MERUS™ MA2304xNS Product Introduction

Infineon Audio Amplifier Solutions
October 2022

MERUS™ multilevel Class D audio amplifier family

GEN1

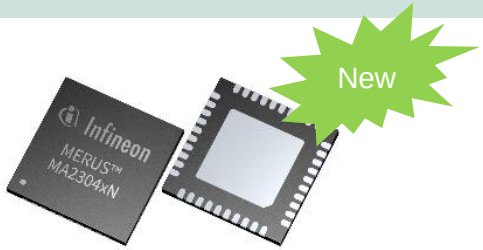


MA12070/P
Analog/Digital 2x80 W

- 4-26 V supply voltage
- 9x9 mm QFN

- MA12070
  - Analog input
  - Selectable gain (20 dB/26 dB)
- MA12070P
  - I2S digital audio input
  - Digital volume control & limiter

GEN2



MA2304xNS
Digital DSP/Non-DSP 2x37 W

- 10-20 V supply voltage
- 6x6 mm QFN
- I2S, TDM digital audio input
- Ultralow idle power (52mW)

- MA2304DNS
  - Integrated DSP
- MA2304PNS
  - Digital volume control & limiter

**Multilevel switching explanation: https://www.youtube.com/watch?v=WykqsxFMvpc&t=2s

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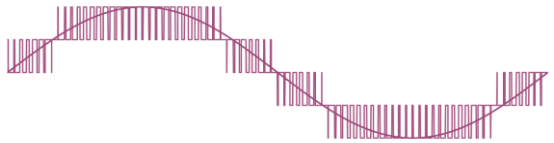
MA2304xNS
2x 37W MERUS™ multilevel gen2 class D amplifier

New Just Released!

Key features

- 52mW ultralow idle power (18V PVDD, LPC mode) and high efficiency at low output power (>80%, 2W, 8Ω)
- Inductor-less output filtering at full power range
- Excellent EMI performance
- 0.03% low THD+N at 1W, 1kHz; Residual noise floor 52µVrms A-weighted
- Configurable output stage – 2x BTL, 1x PBTL
- Two variants:
  - MA2304DNS - integrated DSP with configurable EQ, DRC, Delay
  - MA2304PNS - volume control & peak limiter



Applications

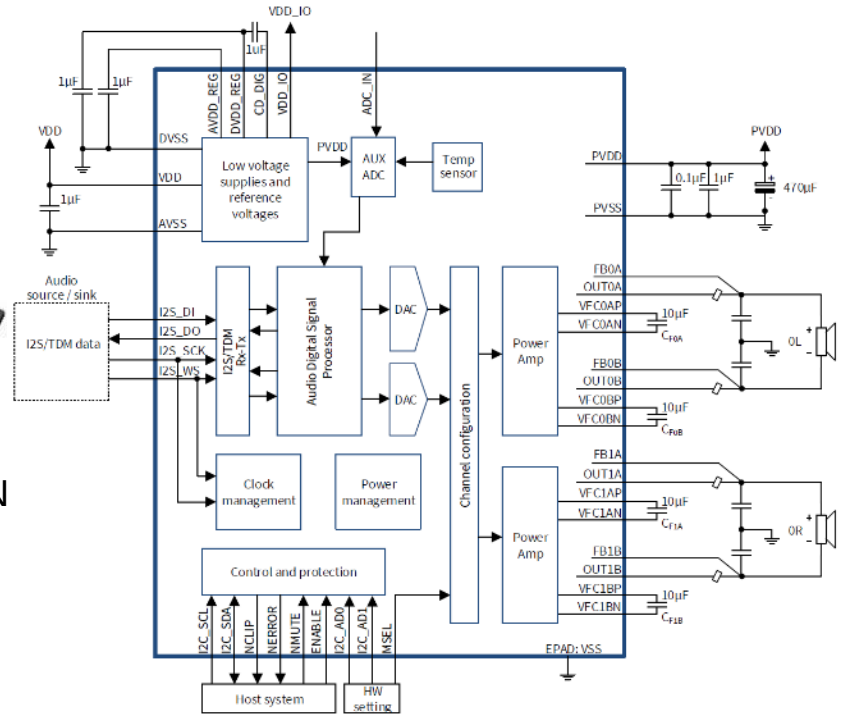
- Battery-powered speakers
- Bluetooth/wireless/smart speakers and soundbars
- Conference speakers
- Multi-channel/multi-room audio systems

Benefits

- Extremely low idle power enables prolonged battery life
- Smallest output filtering without bulky inductors
- Easy-to-pass EMI test without sacrificing efficiency or audio performance
- Premium sound quality due to low THD+N and low noise floor
- Flexible output configuration to support different speaker number and power level



6 x 6 mm 40-pin QFN



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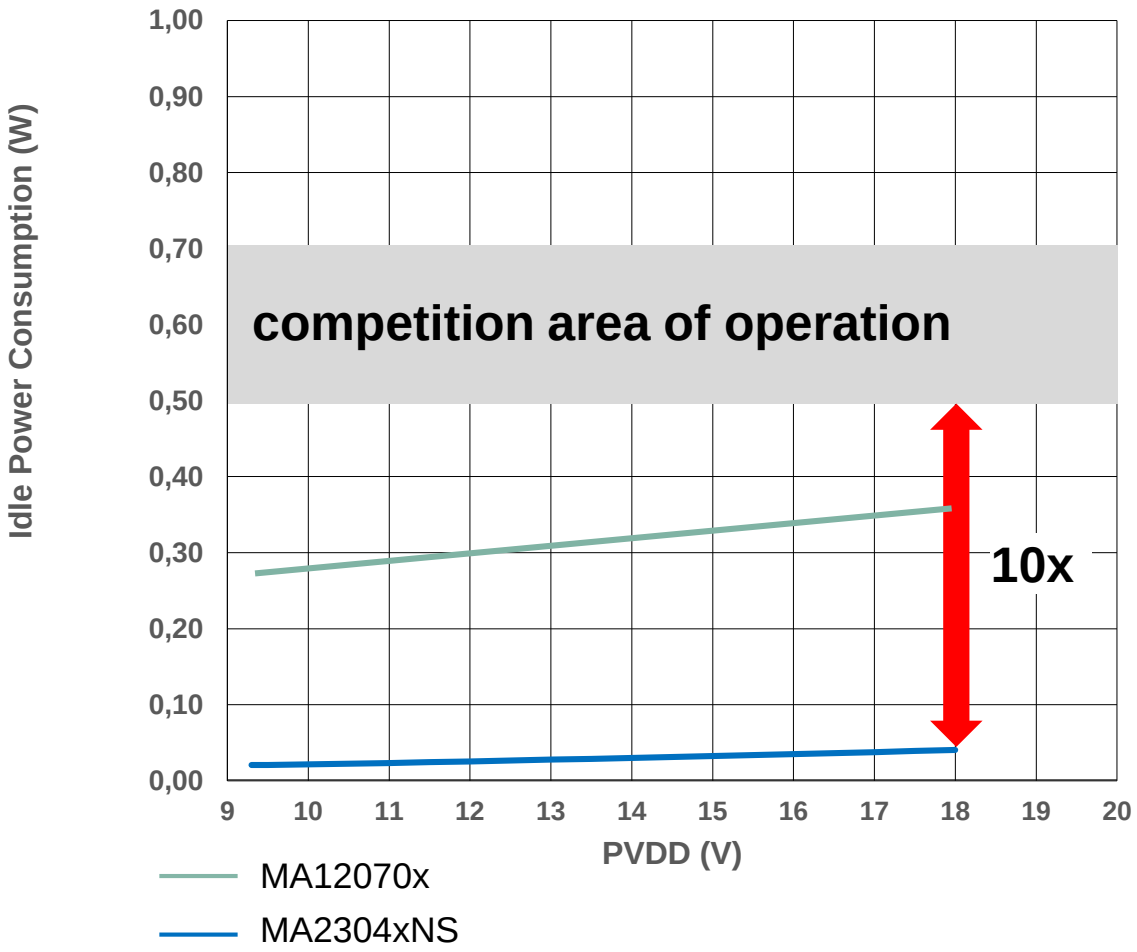
MA2304xNS is 10x better in idle power consumption than competition



What is idle operation? The state of operation when amplifier is fully operational but with no or very low audio output power

MA2304xNS shows extemely low idle power consumption → **52mW** @18V PVDD

Factor of 10 reduction of idle power consumption compared to competition

Idle power consumption dominantly determines efficiency for an audio system

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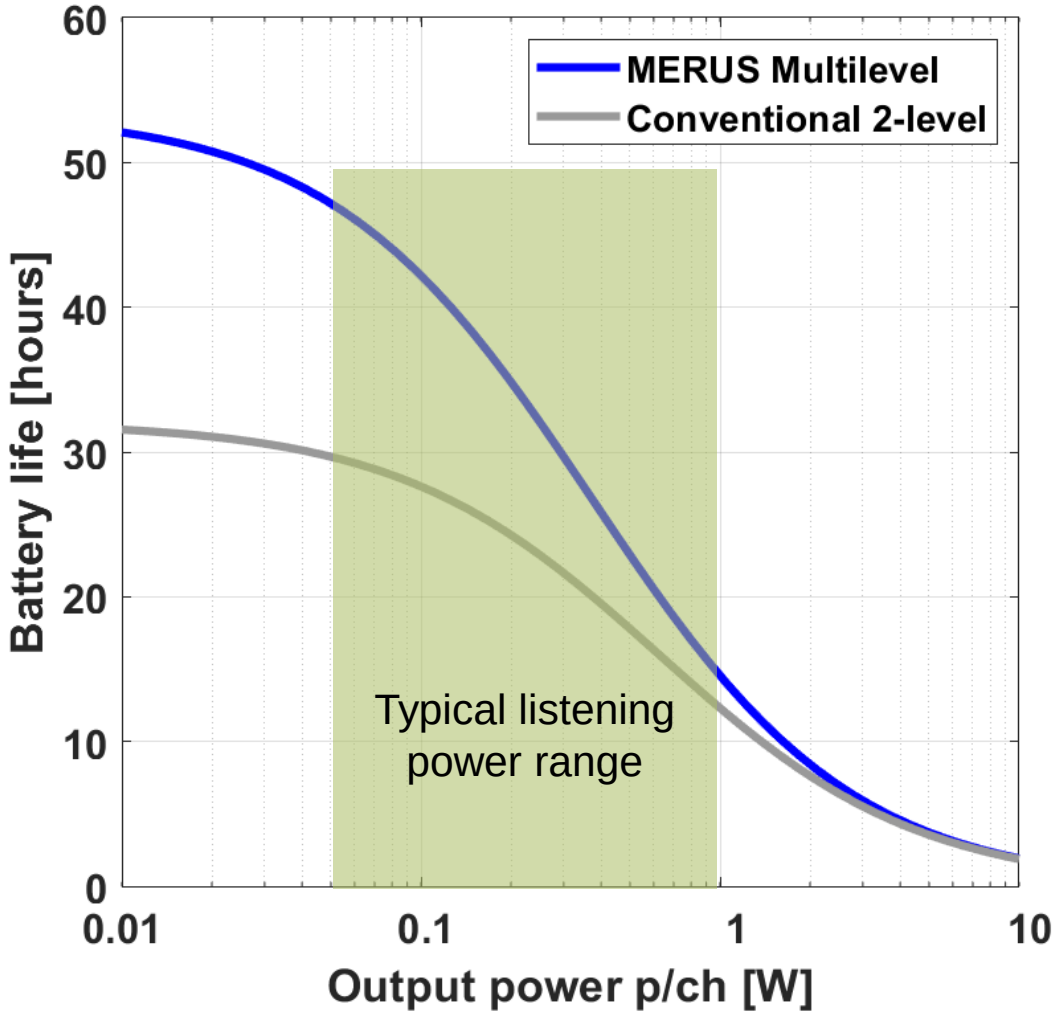
Extend battery life for whole audio system by 30%+ compared to convential class D solution





› Music content is played at low volume most of the time. MA2304xNS can improve playback time by more than 30%

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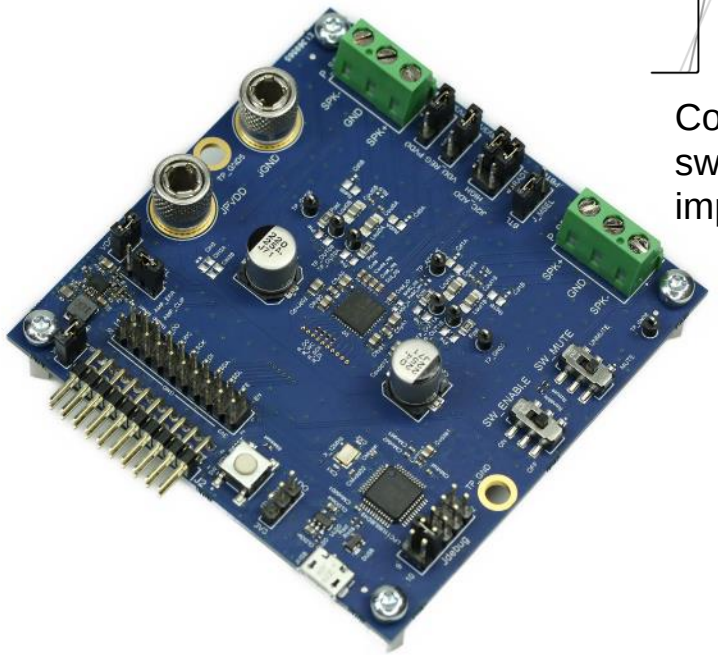
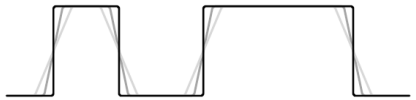
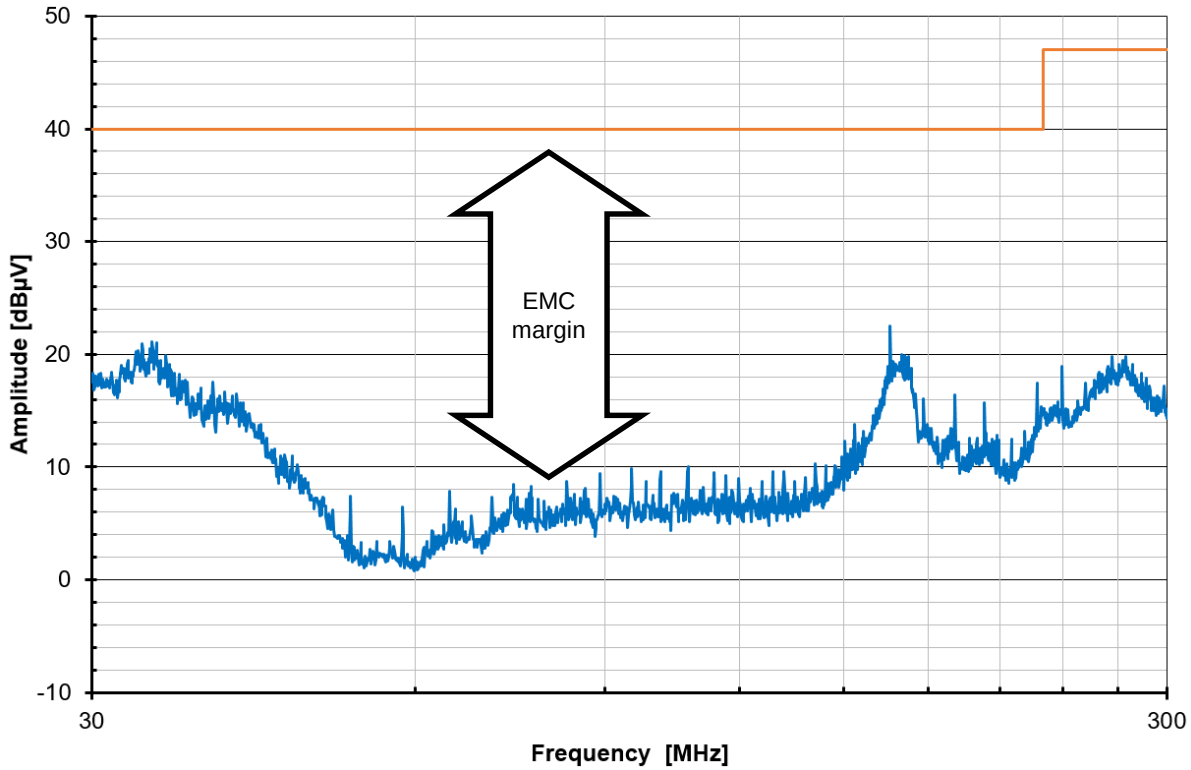
Easier EMC with no LPF inductors at full power range



MA2304xNS EVM



Configurable PWM switching edges to improve EMI



- Noiseless operation with ferrite beads at full output range, saving inductor cost and space compared to competition
- Easy-to-pass EMC test with minimum solution size

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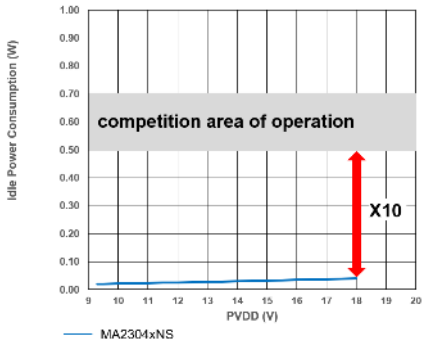
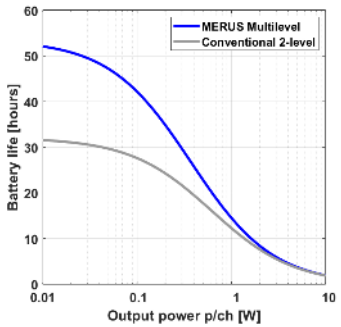
MA2304xNS summary

MA2304xNS value propositions

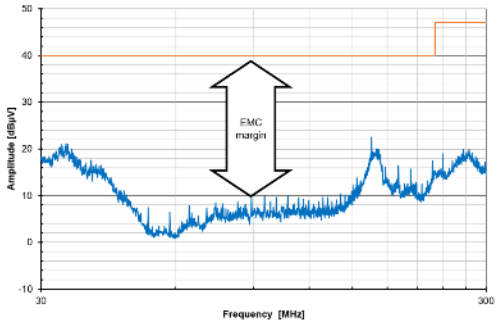
Longer playback time





- 10x better in idle power consumption than competition
- Extend battery life for whole audio system by 30%+

Easier EMC



- Easier EMC with no LPF inductors at full power range

Lower BOM cost



- Reduce battery cost, eliminate inductors and external DSP

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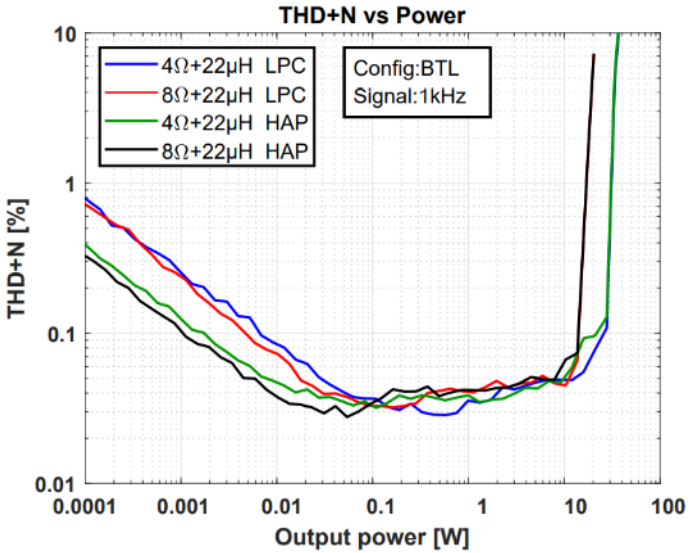
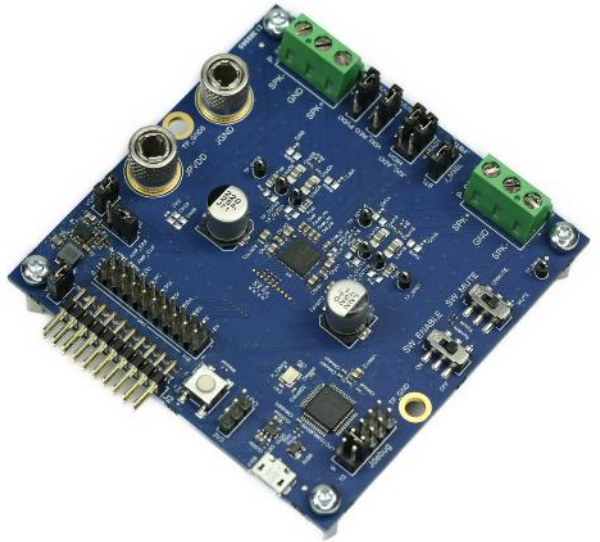
MA2304xNS evaluation board

Available now

EVAL_AUDIO_MA2304DNS / EVAL_AUDIO_MA2304PNS	
Controller IC	**MA2304DNS / MA2304PNS**
Integrated DSP	Yes (MA2304DNS) / No (MA2304PNS)
Value proposition	**Inductor-less LPF, low idle power and EMI**
Target application	Battery powered speakers Bluetooth/wireless/smart speakers Conference call speakers AIO (all in one) computers
Output power /ch	37 W @ THD+N=10%
Signal to noise ratio	106 dB w/A-weighting
# of channels	2xBTL, 1xPBTL
Supply voltage (UVP, nominal, OVP)	18V @ 4Ω
Input type	I2S, TDM
Protections	OCP, OTP, UVLO, OVP





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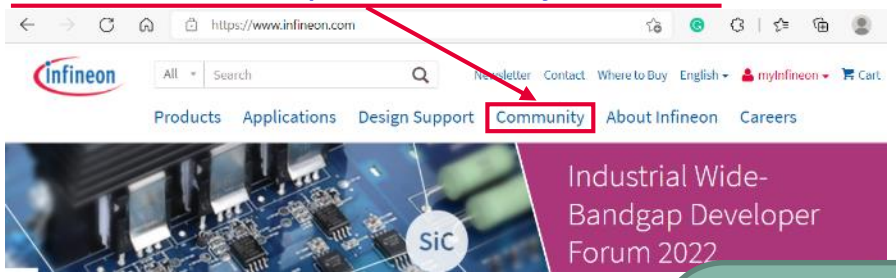
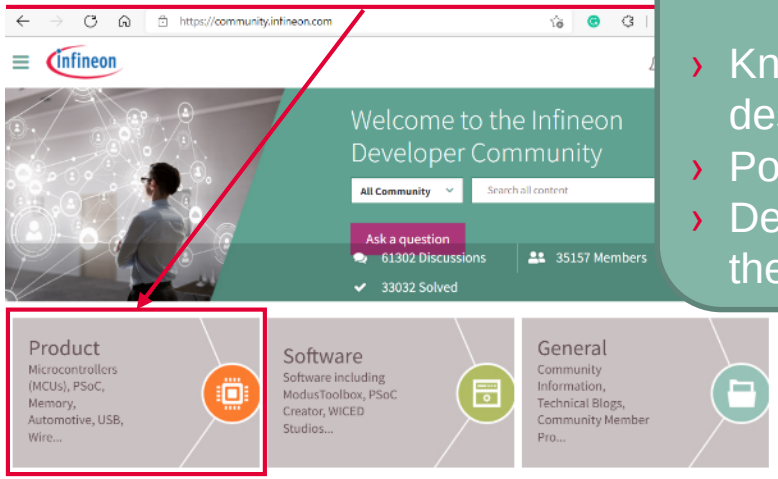
Infineon developer community audio aubforum

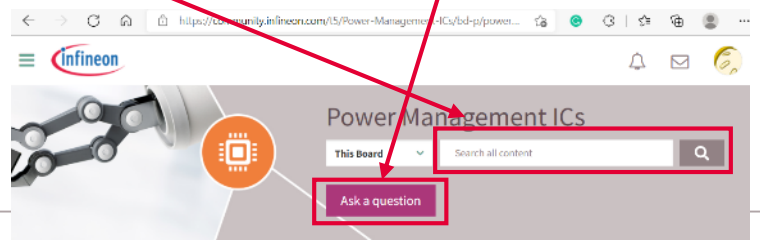
1. Infineon Developer Community Entrance



2. Select “Product” and find “Class D Au



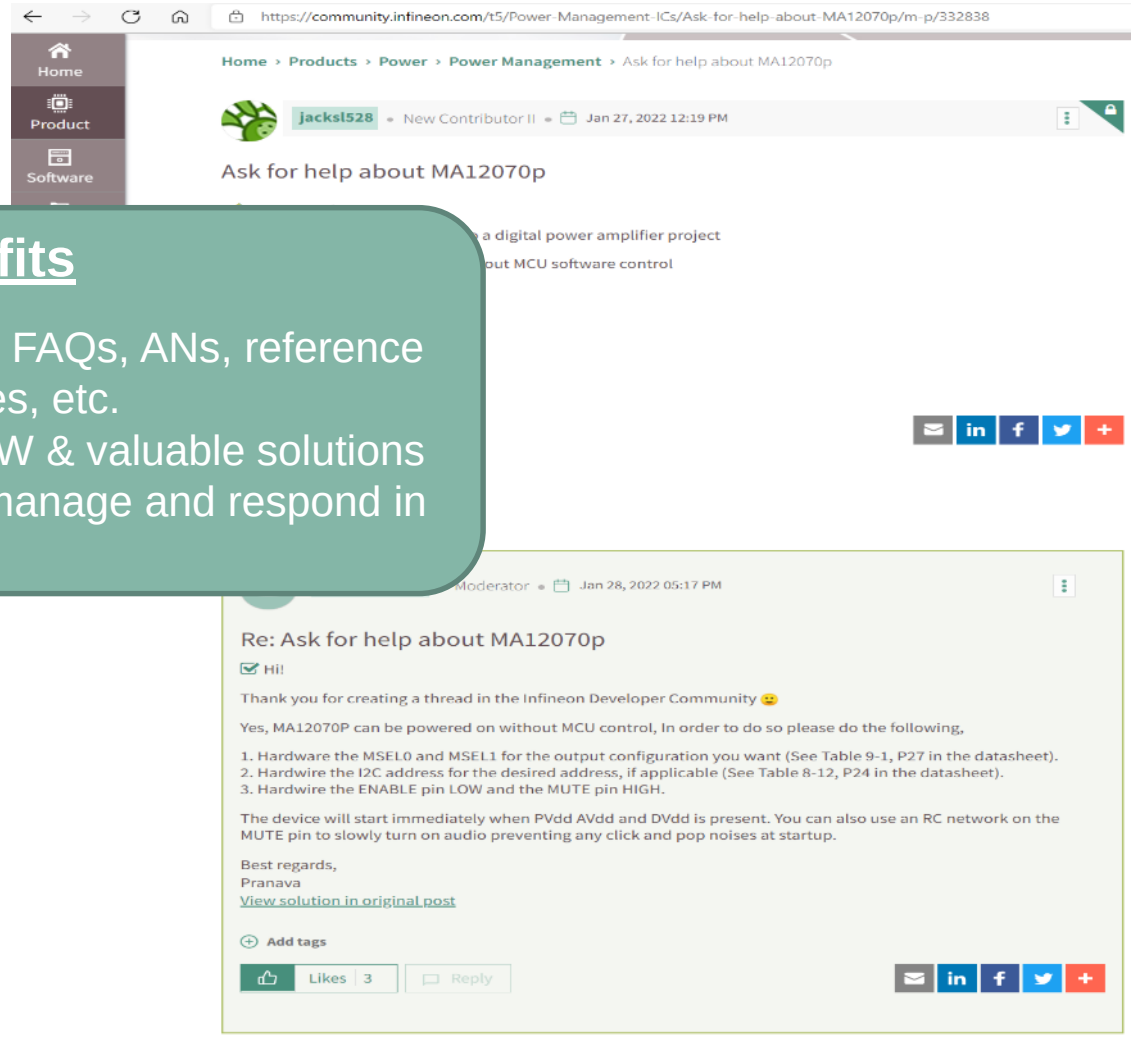
3. Search for threads or post a new one



Benefits

- Knowledge hub for audio FAQs, ANs, reference design files, design guides, etc.
- Posts from customers WW & valuable solutions
- Dedicated personnel to manage and respond in the community forum

Example of question post and solution answer



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