Gerda™ Series IC

HMI Solution for Automotive

Gerda-4UL

Product Brief

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Gerda-4UL

General description

Gerda-4UL is a family of Gerda™ Human Machine Interface (HMI) Display ICs targeted at automotive systems such as instrument clusters and Head-Up Displays (HUD). Gerda-4UL has an Arm® Cortex®-M33 CPU, 2.5D Graphics Engine, Large Built-in RAM, Low-Power features, Hardware Security Module (HSM) and many functional safety mechanisms.

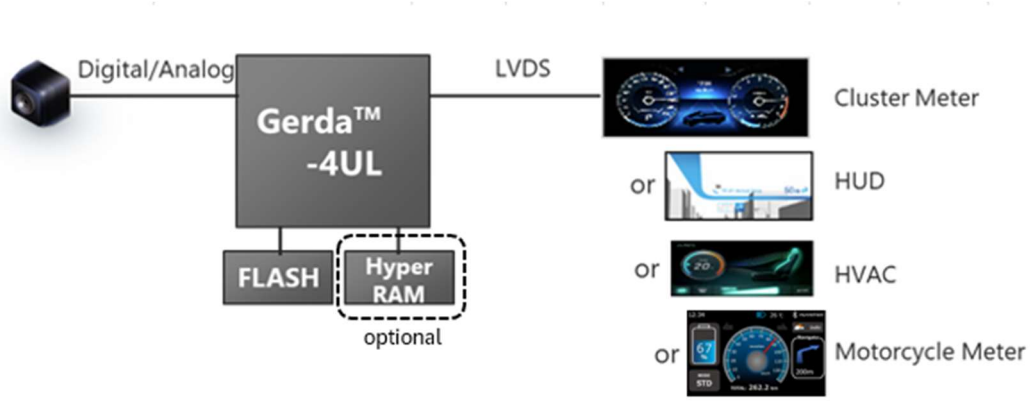
Gerda-4UL integrates high-performance computing, high-speed large-capacity on-chip memory, and advanced image technologies, delivering both ease of use and robust real-time processing capabilities to enable compact, safe and comfortable HMI solutions.

Features

- **CPU subsystem**
  - Arm® Cortex®-M33 CPU
    - IMEM 64 KB, DMEM 64 KB
    - Bus-side Cache 16KB + 4KB
  - DMA controllers 2 x 6ch
- **Video subsystems**
  - Video Input (128/144pins)
    - DRGB or CVBS
    - max display size: 800x480@60FPS
  - Video Output
    - LVDS(4 lane) or DRGB I/F
    - max display size: 800x480@60FPS
  - 2.5D Graphics Engine
  - Image Quality adjustment Engine
    - Gamma, Brightness, Noise shaping
    - Others
- **Memory**
  - Built-In RAM 3.5 MB
  - Quad SPI Flash (Max 6)
  - HyperRAM I/F (8bit Max 512Mbit) : (144pins)
- **Audio**
  - I2S
  - Audio DAC (PWM)
- **Low-Power**
  - Support Standby-mode
  - BackupRAM 8kB

  Wakeup support (RTC/GPIO)
- **Communication I/F**
  - CAN-FD 3ch
  - Ethernet 100Mbps 1ch (144pins)
  - Peripherals
    - I2C 4ch / SSP 4ch / UART 5ch
    - LIN 1ch
    - ADC 10bit 4ch
    - GPIO
- **Security**
  - HSM supporting the EVITA Full
    - AES/ECC/RSA
    - PRNG/TRNG
    - NVM
- **Safety**
  - Functional safety for ASIL-B
    - Memory Protection Unit
    - WDT, ECC, Dual-core Lockstep
    - Boot Time BIST
    - Freeze detection, Telltale check
    - Others
- **Power**
  - Digital block : 0.9V
  - IO block : 3.3V, 1.8V
- **Package**
  - TQFP100L 12x12mm^2
  - TQFP128L 14x14mm^2
  - LQFP144L 20x20mm^2

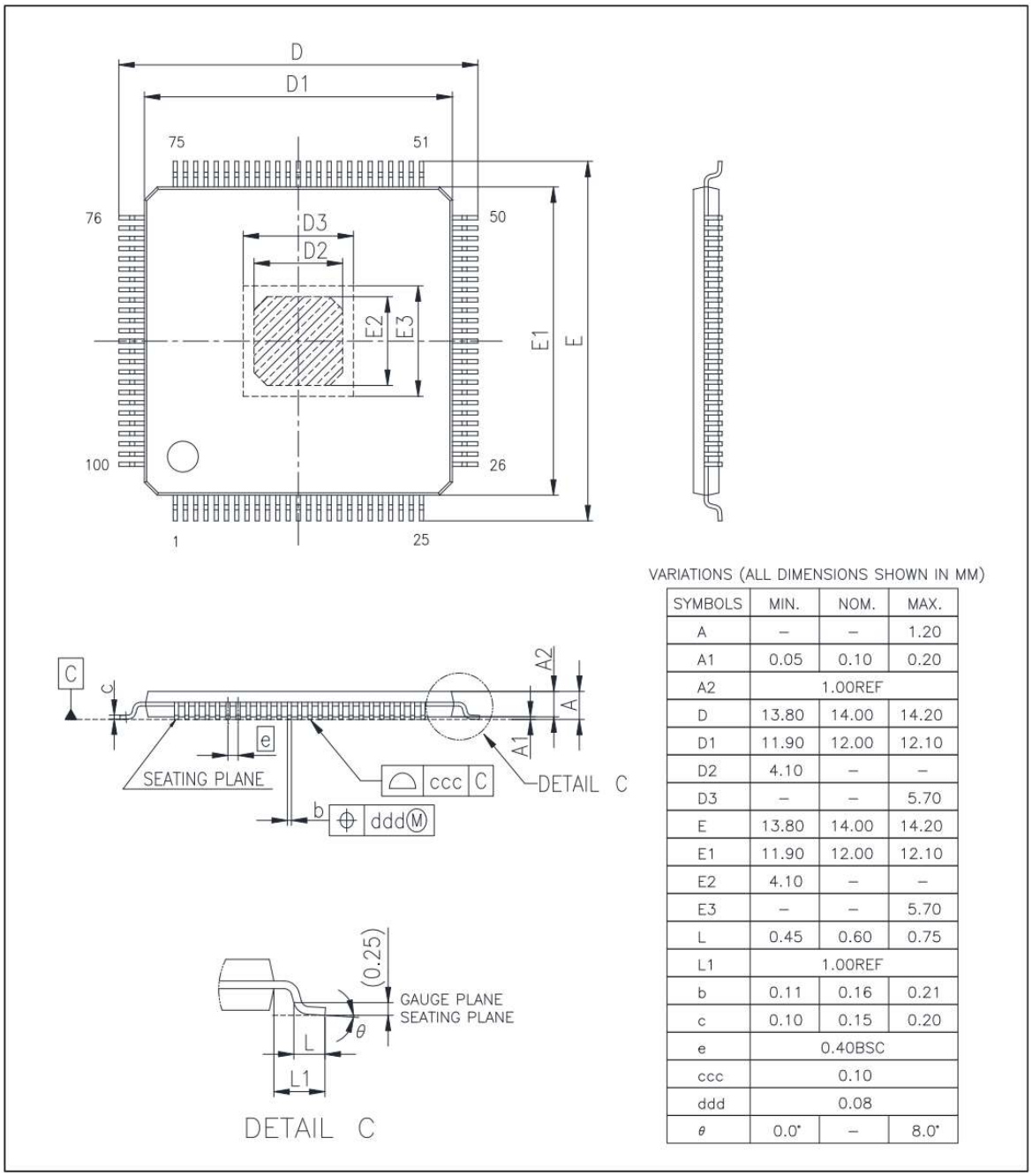
System Configuration Example



Gerda-4UL Series

Part Number	KM2KSZ200UA	KM2KSZ210UA	KM2KSZ250UA
Package	TQFP100L 12x12mm^2	TQFP128L 14x14mm^2	LQFP144L 20x20mm^2
CPU	ARM Cortex®-M7	ARM Cortex®-M7	ARM Cortex®-M7
Graphics	2.5D	2.5D	2.5D
Display size	800x480 (recommended)	800x480 (recommended)	800x480 (recommended)
Video input	-	Analog / Digital	Analog / Digital
Video output	LVDS Single	LVDS Single	LVDS Single
Embedded Memory	3.5MB	3.5MB	3.5MB
External Memory IF	S-Flash	S-Flash	S-Flash / HyperRAM
USB	-	-	-
Ethernet	-	-	Yes
CAN-FD	(Optional)	(Optional)	(Optional)
Security	(Optional)	(Optional)	(Optional)

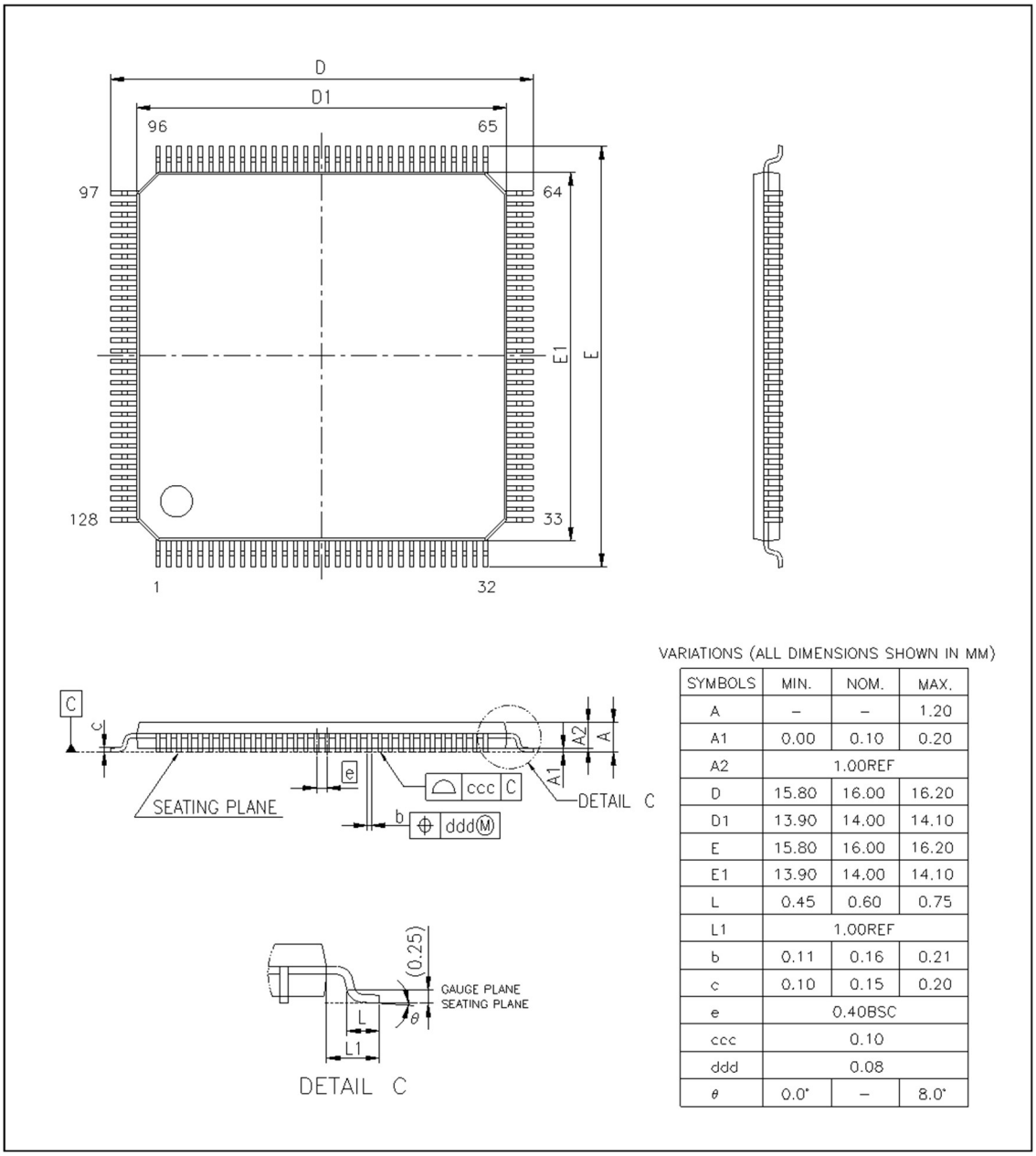
TQFP100L 12x12mm^2, Thickness 1.00mm, Lead_Pitch 0.40mm, Lead_Length 1.00mm, EP_SIZE 4.1x4.1mm^2



VARIATIONS (ALL DIMENSIONS SHOWN IN MM)

SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.20
A1	0.05	0.10	0.20
A2		1.00REF	
D	13.80	14.00	14.20
D1	11.90	12.00	12.10
D2	4.10	–	–
D3	–	–	5.70
E	13.80	14.00	14.20
E1	11.90	12.00	12.10
E2	4.10	–	–
E3	–	–	5.70
L	0.45	0.60	0.75
L1		1.00REF	
b	0.11	0.16	0.21
c	0.10	0.15	0.20
e		0.40BSC	
ccc		0.10	
ddd		0.08	
θ	0.0°	–	8.0°

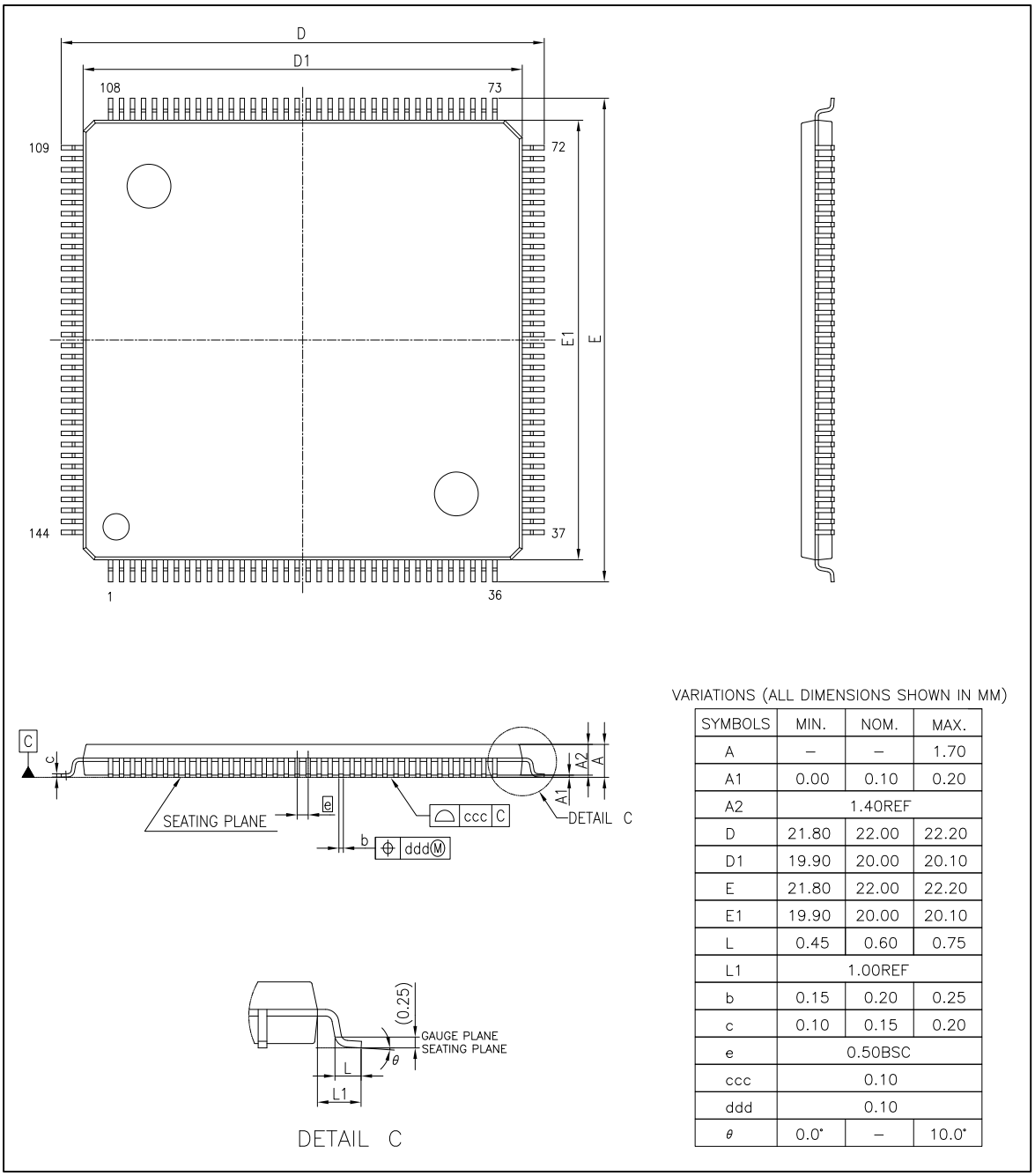
TQFP128L 14x14mm^2, Thickness 1.00mm, Lead_Pitch 0.40mm, Lead_Length 1.00mm



VARIATIONS (ALL DIMENSIONS SHOWN IN MM)

SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.20
A1	0.00	0.10	0.20
A2		1.00REF	
D	15.80	16.00	16.20
D1	13.90	14.00	14.10
E	15.80	16.00	16.20
E1	13.90	14.00	14.10
L	0.45	0.60	0.75
L1		1.00REF	
b	0.11	0.16	0.21
c	0.10	0.15	0.20
e		0.40BSC	
ccc		0.10	
ddd		0.08	
θ	0.0°	–	8.0°

LQFP144L 20x20mm^2, Thickness 1.40mm, Lead_Pitch 0.50mm, Lead_Length 1.00mm



VARIATIONS (ALL DIMENSIONS SHOWN IN MM)

SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.70
A1	0.00	0.10	0.20
A2		1.40REF	
D	21.80	22.00	22.20
D1	19.90	20.00	20.10
E	21.80	22.00	22.20
E1	19.90	20.00	20.10
L	0.45	0.60	0.75
L1		1.00REF	
b	0.15	0.20	0.25
c	0.10	0.15	0.20
e		0.50BSC	
ccc		0.10	
ddd		0.10	
θ	0.0°	–	10.0°