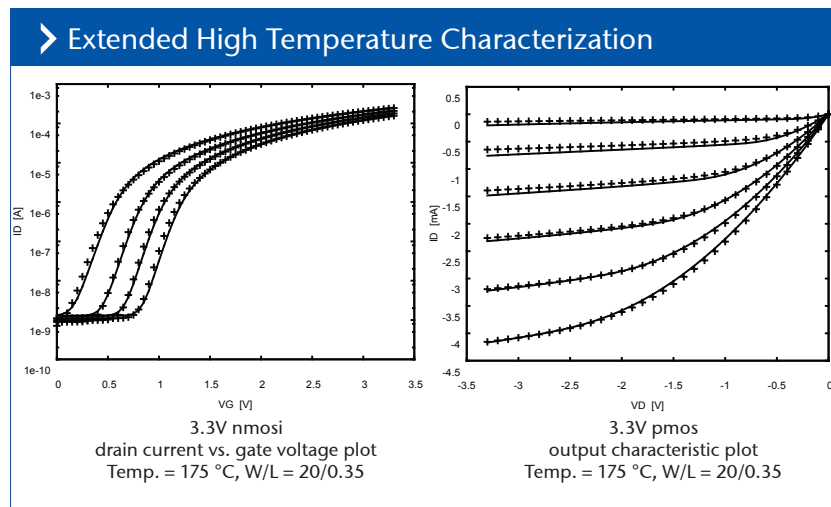
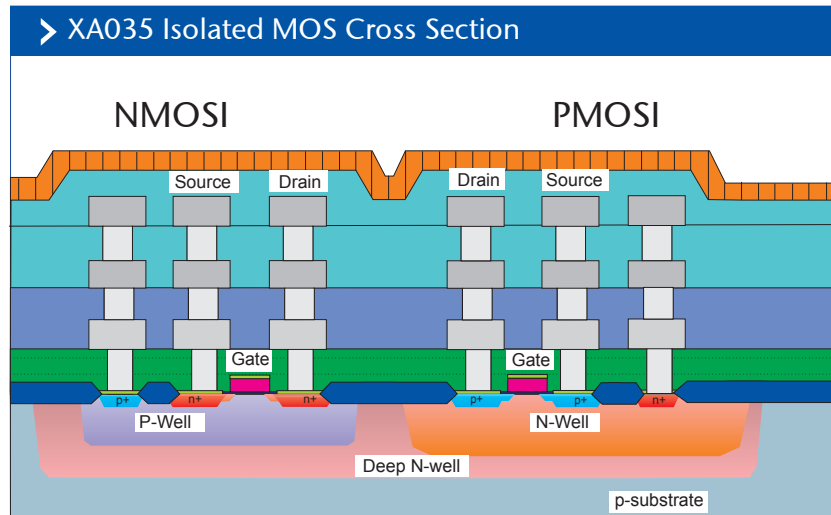


> XA035

High Temperature combining HV and NVM modular CMOS Technology

> Modular 0.35 μm High Temperature CMOS process with operating temperature up to 175 $^{\circ}\text{C}$.

The XA035 process is ideally suited for high-precision analog circuits, sensor front-ends, and brushless DC motor controls for automotive, industrial, aerospace and military markets.



> Module Overview

CORE

MOS

3.3V MOS module, 1P3M

FEOL

MOS5A

Mid gate oxide module

ISOMOS

Isolated MOS module

THKOX

Thick gate oxide module

HVMOSMID

Mid gate oxide module for HV transistors

HVMOSTHK

Thick gate oxide module for HV transistors

DEPL

Depletion NMOS module

BURDIF

Buried N module

CAPPOLY

Polysilicon 2 module

HRPOLY

High resistance polysilicon 1 module

XRPOLY

Very high resistance polysilicon 1 module

TEEPROM

EEPROM module

BEOL

MIM

MIM capacitor module

DMIM

Double MIM module

METAL2

Top metal 2 module

METAL4

Metal 4 module

THKMET

Thick metal 4 module

PIMIDE

Polyimide module

0.35 μm CMOS Process Family

> XA035

Features

- 3.3V logic layout & performance compatible with industry standard
- Extended high temperature characterisation, up to 175 °C operating temperature
- Device model improvement, accurate device matching for high temperature environment
- Level 1 lifetime specification in Process Reliability document
- Lifetime calculator tool for device reliability estimation based on automotive mission profile
- High-voltage component up to 45V and 14V automotive board net ready
- NVM with EEPROM and OTP option (Zener Zap, Poly Fuse)
- RF characterisation and models for all RF MOS transistors and passive components
- High density RAM, DPRAM and ROM blocks
- Diva, Dracula, Calibre DRC & LVS parasitic extraction

Capacitors (Selection)

Parameter	Area Cap [fF/μm ²]	BV [V]	Max VTB [V]
poly1/poly2 cap.	0.85	> 26	100
POD cap.	3.90	> 5.0	18
MIM cap.	1.25	> 20	100
DMIM cap.	2.5	> 20	100

Resistors (Selection)

Parameter	RS [Ω/□]	Temp. Coeff [10 ⁻³ /K]	Max VTB [V]
Low TC poly2 resistor	200	-0.7	100
N+ high res. poly resistor	1000	-2.8	100
Very high res. poly resistor	10000	-4.3	100

Bipolar Transistors (Selection)

Parameter	BETA	VA [V]	Max VCE [V]
Vertical PNP	4.5	190	3.6
Lateral PNP	27	4.2	3.6
Isolated vertical NPN	46	38	5.5



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Design Rules

Parameter	Min. Width [μm]	Min. Spacing [μm]
N-well	1.6	1.0
Active Area	0.5	0.6
Polysilicon Gate	0.35	0.45
Contact	0.4	0.4
Metal 1/ 2	0.5	0.45/0.5
Via 1/ 2/ 3	0.5	0.45
Metal 3 (Top M)	0.5	0.6
Metal 4	0.6	0.6
Thick Metal 4	3.0	2.5

HV MOS Transistors (Selection)

Parameter	VT [V]	RDSon [kΩ.μm]	BVDSS [V]	Max VGS [V]
12V NMOS	0.59	17	> 13.2	3.6
14V drain & source NMOS	0.92	11	>20	18
14V drain & source PMOS	0.95	30	>20	18
18V drain & source NMOS	0.94	15	>20	18
18V drain & source PMOS	1.00	36	>20	18
45V drain depletion NMOS	-	12	> 50	18
45V N-DMOS (thick oxide)	1.40	19.5	> 50	18
45V N-DMOS (thin oxide)	0.55	22	> 50	3.6
70V N-DMOS (mid oxide)	0.88	25	> 88	5.5
70V N-DMOS (thick oxide)	1.33	18	> 88	18
90V N-DMOS (mid oxide)	0.88	21	> 110	5.5
90V N-DMOS (thick oxide)	1.33	19	> 110	18

Diodes (Selection)

Parameter	Vf [V]	Vr @ 100nA [V]	BVr [V]
Polysilicon diode	1.2	4.7	6.8

TEEPROM

Parameter	Values
Supply voltage	1.8V ... 3.6V
Configuration	up to 16Kbit including charge pump
Temperature range	-40 ... +175 °C (read) / +150 °C (write)
Data retention	10 years @ 85 °C

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