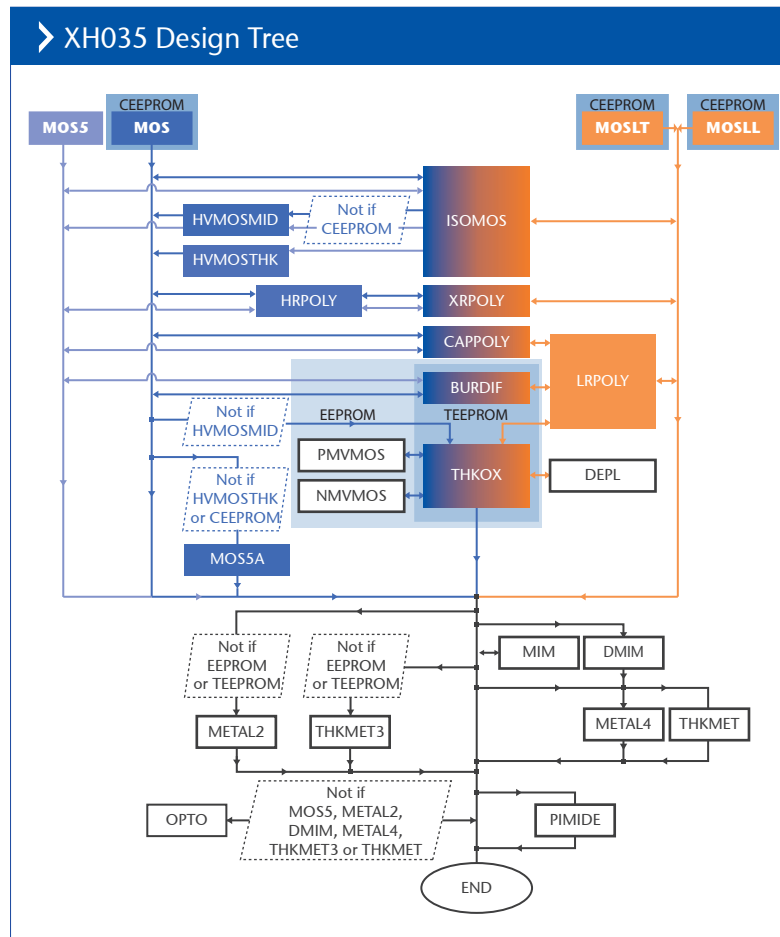


> XH035

Analog, RF and 100V High Voltage Options with Non Volatile Memory

> Modular 0.35 μm CMOS process with 4 different process cores for analog/mixed-signal and high voltage applications.

With extended operating voltage range from 45-to-100-volts, it enables a new class of reliable, high-performing battery monitoring and protection systems for battery management. It also is ideal for power management applications and for ultrasonic imaging and inkjet print head apps using piezoelectric drivers.



Modules Overview	
Core	Descriptions
MOS	Standard MOS module
MOSLL	Low threshold MOS module
MOSLT	Low leakage MOS module
MOS5	Mid gate oxide MOS module

FEOL	Descriptions
MOSSA	Mid gate oxide module
ISOMOS	Isolated MOS module
THKOX	Thick gate oxide module
NMVMOS	Medium voltage NMOS module
PMVMOS	Medium voltage PMOS 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
LRPOLY	Low resistance polysilicon 1 module
HRPOLY	High resistance polysilicon 1 module
XRPOLY	Very high resistance polysilicon 1 module
EEPROM	EEPROM module
TEEPROM	Tiny EEPROM module
CEEPROM	Core EEPROM module

BEOL	Descriptions
MIM	MIM Capacitor module
DMIM	Double MIM capacitor module
METAL2	Top metal 2 module
THKMET3	Thick metal 3 module
METAL4	Top metal 4 module
THKMET	Thick metal 4 module
OPTO	Optical window module
PIMIDE	Polyimide module

0.35 μm CMOS Process Family

> XH035

Features

- 3.3V logic layout & performance compatible with industry standard
- Low leakage (MOSLL) and low threshold voltage (MOSLT) options
- Optional triple well isolation for 3.3V CMOS, 5V dual gate or 5V single gate oxide for 5V operation
- Range of medium- and high- voltage MOS Transistors with BV up to 110V
- Thin gate oxide HV transistor for power management applications
- DMOS transistors with gate oxide thicknesses of 14nm or 40nm with 5V or 12V drive capability supporting operating voltages of 55V, 75V and 100V
- RF characterisation and models for all RF MOS transistors and passive components
- HV sandwich capacitor up to 100V operating voltage
- NVM with EEPROM, TEEPROM, CEEPROM, OTP
- Thick top metal options for inductors and Smart Power applications
- High Density Standard Library up to 28000 gates per mm²
- Assura, Diva, Dracula, Calibre, Hercules, Star-RCXT DRC & LVS & parasitic extraction.

Capacitors (Selection)

Parameter	Area Cap [fF/μm ²]	BV [V]	Max VCC [V]
poly1/poly2 cap.	0.85	30	10
POD cap.	3.90	8.6	3.6
MIM cap.	1.25	30	10
DMIM cap.	2.5	30	10

Resistors (Selection)

Parameter	RS [Ω/□]	Temp. Coeff [10 ⁻³ /K]	Max VTB [V]
Low TC poly2 res. (MOS)	200	-0.2	100
N+ high res. poly resistor	1000	-2.8	45
Very high res. poly resistor	10000	-4.3	45



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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	0.5	0.45
Via 1/ 2/ 3	0.5	0.45
Metal 2/ 3	0.6	0.5
Top Metal 2/ 3/ 4	0.6	0.6
Thick Metal	3.0	2.5

MOS Transistors (Selection)

Parameter	VT [V]	Ron*A [mΩ.mm ²]	BVDSS [V]	Max VGS [V]
3.3V NMOS (MOS)	0.60	-	>5.5	3.6
3.3V PMOS (MOSLT)	0.50	-	>5.5	3.6
5V NMOS	1.15	-	12	5.5
Iso. 5V PMOS mid ox. (HV)	1.10	-	>7	5.5
12V NMOS	0.59	-	12	3.6
14V drain & source NMOS	1.00	-	>20	18
18V drain & source PMOS	1.00	-	>20	18
45V N-DMOS (thin oxide)	0.55	-	70	3.6
45V cmp N-DMOS (thk ox.)	1.33	81	>58	18
70V N-DMOS (thick oxide)	1.33	140	> 88	18
90V dr. PMOS (mid oxide)	1.12	631	>102	5.5
90V N-DMOS (thick oxide)	1.33	166	>110	18

Bipolar Transistors (Selection)

Parameter	BETA	VA [V]	VBE [V]	Max VCE [V]
Vertical PNP (MOS, MOSS)	4.5	190	720	3.6
Vertical PMP (MOSLT/LL)	7	200	730	3.6
Lateral PNP (MOS)	27	4.2	730	3.6
Lateral PNP (MOSLT/LL)	6	14	750	3.6
Isolated vertical NPN	48	38	680	5.5
Vertical PNP (p-well) (MOS)	45	>70	695	100
V.PNP (p-well) (MOSLLT/LL)	68	>70	695	100

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