

IP Data Sheet

Over-Voltage Lockout for protection of battery-operated circuits

The TS_OVLO_3V3_X8 protects battery-operated circuits against damage when they are exposed to risks of their supply connector accidentally being wired to higher or wrong-polarity voltages, with extremes at $\pm 30V$. When battery-side input VBAT receives a voltage outside the range from 0V to typically +3.53V, the OVLO breaks the current paths to the three outputs VOUT1, VOUT2 and VOUT3.

When VBAT voltage is valid, the TS_OVLO_3V3_X8 draws as little current as 950nA maximum over the air temperature range from $-40^{\circ}C$ up to $+85^{\circ}C$, which is ideal for battery longevity during shutdown periods. The on-state resistance to outputs VOUT2 and VOUT3 is 65Ω maximum for low battery voltage at +2.1V. The on-state resistance to output VOUT1

is 3Ω maximum and it can be further reduced by placing external PMOS switches in parallel, of which the gate is driven by control output PGATEOV.

The TS_OVLO_3V3_X8 contains a multiplexer that switches output VOUT1 over to system-side power input VIN2 when control input ONVIN2 is pulled up and provided that its voltage is regulated to $3.3V \pm 0.1V$. The corresponding on-state resistance is 1Ω maximum over the junction temperature range from $-40^{\circ}C$ up to $+150^{\circ}C$.

The minimum continuous operation lifetime spans 100000 hours.

Technology: X-FAB XT018-0.18 μm BCD-on-SOI CMOS

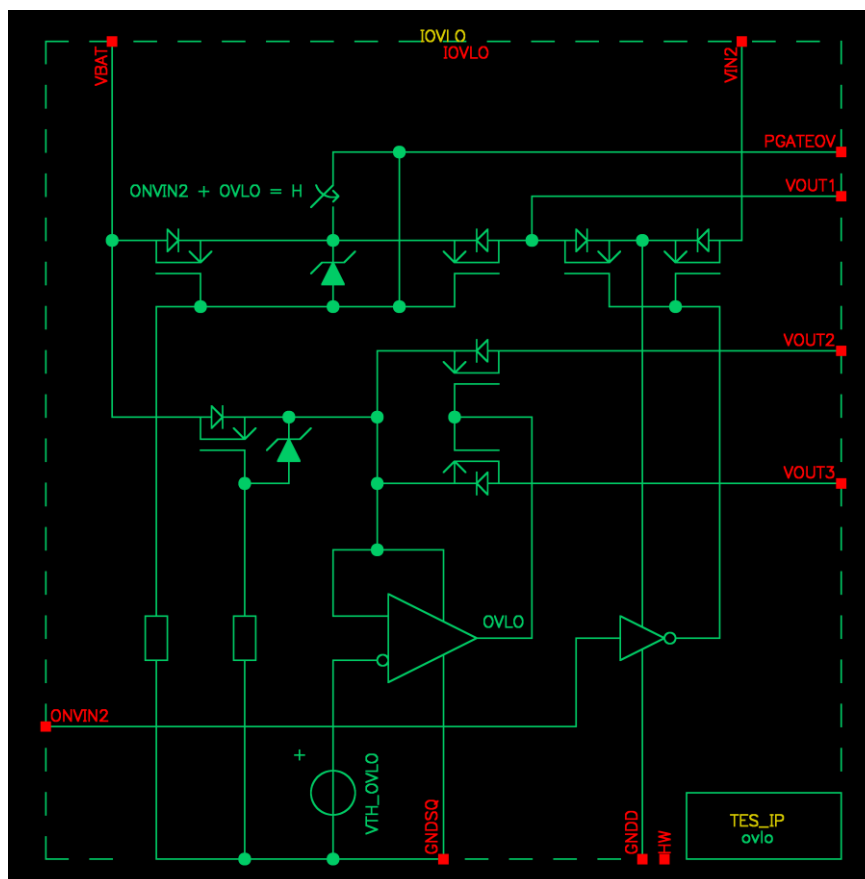


Fig. 1: OVLO Symbol

OPERATING CONDITIONS

Parameters	Values / Type
Temperature ranges	Air, TA: -40°C up to +85°C Junction, TJ: -40°C up to +150°C
Power input voltages with respect to ground GNDD and GNDSQ	VBAT : -30V up to +30V VIN2 : 3.2V up to 5.5V
ONVIN2 H-level voltage	VIN2

Table 1: TS_OVLO_3V3_X8 Operating Conditions

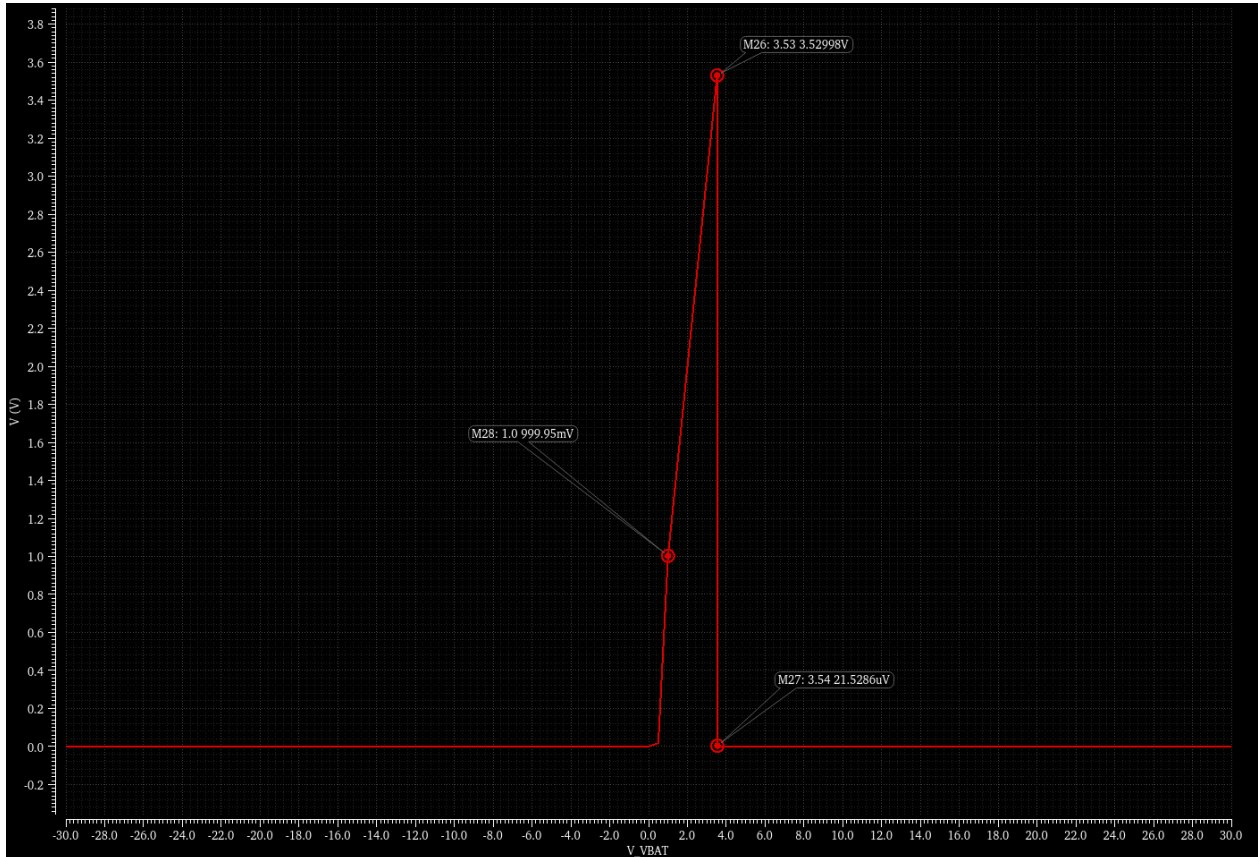
SPECIFICATION

Parameters	Values
VTH_OVLO, Overvoltage-Lockout threshold	+3.53V typ. (+3.56V max, +3.34V min)
RON_VBAT_VOUT1, VBAT to VOUT1 on-state resistance, ONVIN2 = L	3Ω max at 2.1V
RON_VBAT_VOUT23, VBAT to VOUT2,3 on-state resistance	65Ω max at 2.1V
RON_VIN2_VOUT1, VIN2 to VOUT1 on-state resistance, ONVIN2 = H	1Ω max at 3.2V
ROFF_VIN2_VOUT1, VIN2 to VOUT1 off-state resistance, ONVIN2 = L	50MΩ min
I_VBAT_30VREVERSE, reverse current through VBAT at -30V	-50nA min, -1nA max
Current consumptions	VBAT : 950nA max at +3.3V VIN2 : 98μA max at 3.4V and ONVIN2 = H
Area	0.455mm ²

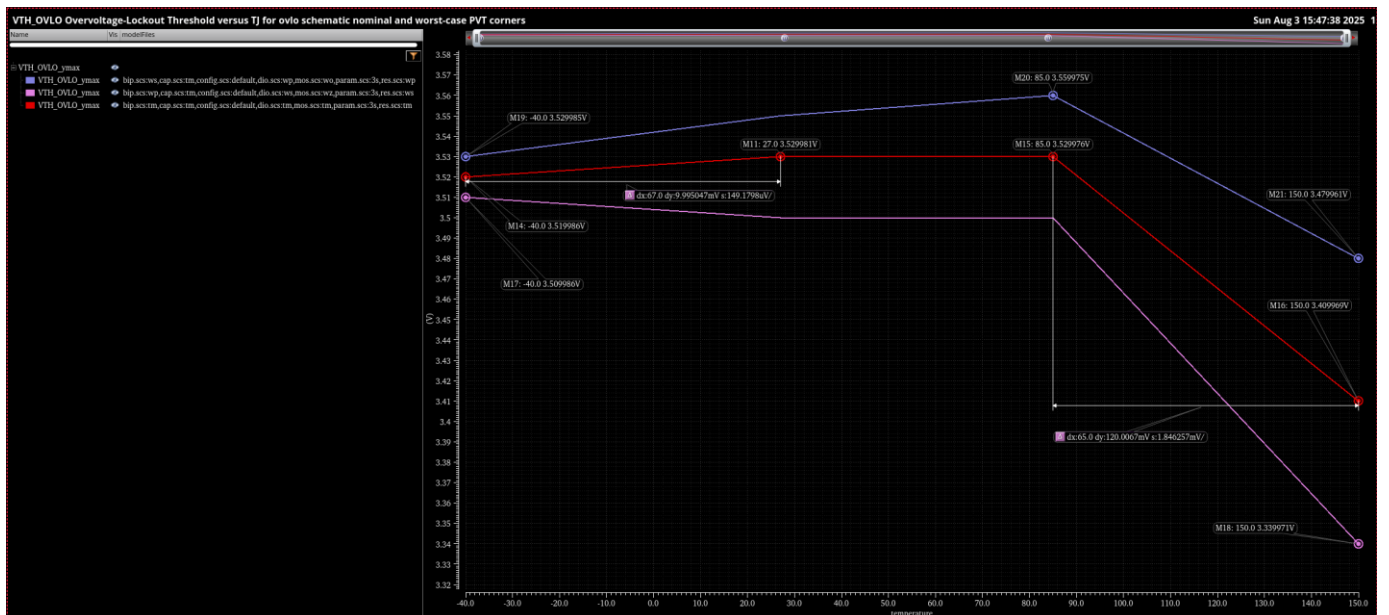
Table 2: TS_OVLO_3V3_X8 Specifications

Sales & Marketing Contact

TYPICAL VOUT RESPONSE TO VBAT VOLTAGE WITH 300K Ω PULL-DOWN ON VOUT1,2,3



VTH_OVLO OVERVOLTAGE LOCKOUT THRESHOLD LOW SENSITIVITY TO JUNCTION TEMPERATURE



LAYOUT VIEW

