# SMIC40: SSTL_15/18

## Libraries

| Name | Process | Form Factor |
|---|---|---|
| RGO_SMIC40_25V15_LL_20C_SSTL_15_18 | LL | Staggered CUP |

## Summary

The SSTL_15_18 combo pad set supports bidirectional single-ended and differential SSTL_15 and SSTL_18 signaling. The driver/receiver pairs, with embedded power cells, are supplied with a full complement of calibration, voltage reference, power, spacer, and adapter cells to assemble a pad ring by abutment. An included rail splitter allows isolated SSTLdomains (1.5V/1.8V) to be placed in the same pad ring with 2.5V/3.3V GPIO domains while maintaining continuous VDD/VSS in the pad ring for robust ESD protection.

**Features:**

- Full DDR3 capability - 800MHz (1600 MT/s)
- Full DDR2 capability
- Low Power driving standard DDR3 memories
- User programmable ODT Capability - dynamic 6-Bit PVT calibration to an external reference resistor

**ESD Protection:**

- JEDEC compliant
  - 2KV ESD Human Body Model (HBM)
  - 200 V ESD Machine Model (MM)
  - 500 V ESD Charge Device Model (CDM)

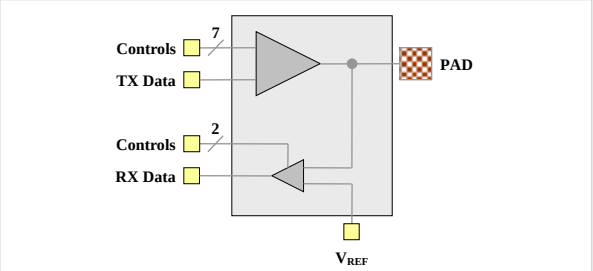
**Latch-up Immunity:**

- JEDEC compliant
  - Tested to I-Test criteria of ± 100mA @ 125°C

## Recommended operating conditions

| | Description | | Min | Nom | Max | Units |
|---|---|---|---|---|---|---|
| $V_{VDD}$ | Core supply | | 0.99 | 1.1 | 1.21 | V |
| | | | 1.08 | 1.2 | 1.26 | V |
| $V_{DVDD}$ | I/O supply | SSTL_15 | 1.425 | 1.5 | 1.575 | V |
| | | SSTL_18 | 1.7 | 1.8 | 1.9 | V |
| $V_{VREF}$ | Reference | | .49 x $V_{DVDD}$ | $V_{DVDD}$ | .51 x $V_{DVDD}$ | V |
| $T_J$ | Junction temp | | -40 | 25 | +125 | °C |
| $V_{PAD}$ | PAD voltage | | $V_{DVSS}$ | | $V_{DVDD}$ | V |
| $V_{IH}$(DC) | DC input logic high | SSTL_15 | $V_{REF}$+.100 | - | $V_{DVDD}$ | V |
| | | SSTL_18 | $V_{REF}$+.125 | - | $V_{DVDD}$ | |
| $V_{IL}$(DC) | DC input logic low | SSTL_15 | $V_{DVSS}$ | - | $V_{REF}$-.100 | V |
| | | SSTL_18 | $V_{DVSS}$ | | $V_{REF}$-.125 | |
| $V_{IH}$(AC) | AC input logic high | SSTL_15 | $V_{REF}$+.175 | - | - | V |
| | | SSTL_18 | $V_{REF}$+.200 | - | - | |
| $V_{IL}$(AC) | AC input logic low | SSTL_15 | | - | $V_{REF}$-.175 | V |
| | | SSTL_18 | | - | $V_{REF}$-.200 | |

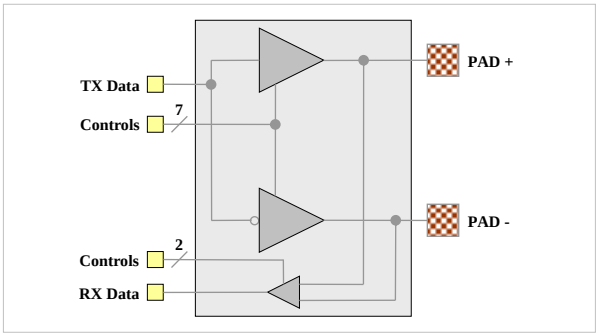
## SLP_BI_SDS_18V_D – SSTL_15/18 Driver




## AC Characteristics

| Symbol | Parameter | | Max | Unit |
|---|---|---|---|---|
| F | Max frequency | | 800 | MHz |
| $P_{DISS}$ | Power dissipation | SSTL_18 - 400 MHz | 19.6 | mW |
| | | SSTL_15 - 800 MHz | 10.2 | mW |

## SLP_CL_SDS_18V_D – SSTL_15/18 Clock Driver




## AC Characteristics

| Symbol | Parameter | | Max | Unit |
|---|---|---|---|---|
| F | Max frequency | | 800 | MHz |
| $P_{DISS}$ | Power dissipation | SSTL_18 - 400 MHz | 61.3 | mW |
| | | SSTL_15 - 800 MHz | 20.5 | mW |

# SMIC40: SSTL_15/18

## Characterization Corners

| Nominal VDD | Model | VDD | DVDD=1.5/1.8V | Temperature |
|---|---|---|---|---|
| 1.1 | FF | +10% | +5% | -40°C |
| | FF | +10% | +5% | 125°C |
| | TT | nominal | nominal | 25°C |
| | SS | -10% | -5% | -40°C |
| | SS | -10% | -5% | 125°C |

## Cell summary

| Name | Description |
|---|---|
| SLP_BI_SDS_18V_D /DVDD/DVSS/PDO | SSTL_15/18 Driver / receiver with power |
| SLP_CL_SDS_18V_D_PWR | Differential clock driver with DVDD/DVSS |
| SLP_SP_CAL_SDS_18V | SSTL_15 Calibration pad |
| SLP_RE_000_1518V | SSTL Voltage Reference |
| PVP_VD_RCD_1218V | Core power (VDD) |
| PVP_VS_RCD_1218V | Core ground (VSS) |
| SVP_SP_000_1518V | 0.1 µm spacer |
| SVP_SP_001_1518V | 1 µm spacer |
| SVP_SP_005_1518V | 5 µm spacer |
| SVP_SP_010_1518V | 10 µm spacer |
| SPP_RS_005_1518V | DVDD, DVSS, POC, CP[1..3], CN[1..3] and VREF rail splitter |
| SPP_AD_SSTL_1518V | Adapter to staggered libraries |
| SVP_CO_001_1518V | Corner cell |

## Physical size

| Name | Width | Height | Units |
|---|---|---|---|
| SLP_BI_SDS_18V_D/DVDD/DVSS/PDO | 55 | 240 | µm |
| SLP_CL_SDS_18V_D_PWR | 110 | 240 | µm |
| SLP_SP_CAL_SDS_18V | 27.5 | 240 | µm |
| SLP_RE_000_1518V | 27.5 | 240 | µm |
| PVP_VD_RCD_1218V | 27.5 | 240 | µm |
| PVP_VS_RCD_1218V | 27.5 | 240 | µm |
| SVP_SP_000_1518V | 0.1 | 240 | µm |
| SVP_SP_001_1518V | 1 | 240 | µm |
| SVP_SP_005_1518V | 5 | 240 | µm |
| SVP_SP_010_1518V | 10 | 240 | µm |
| SPP_RS_005_1518V | 5 | 240 | µm |
| SPP_AD_SSTL_1518V | 25 | 240 | µm |
| SVP_CO_001_15V | 240 | 240 | µm |



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