# VTTL065R17BNA

# Datasheet

## General Description

| $V_{(BR)DSS}$ | $R_{DS(ON)\_max}$ | $I_D$ |
|---|---|---|
| 650V | 1.7Ω@10V | 7A |

## Symbol

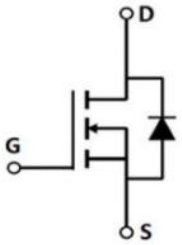
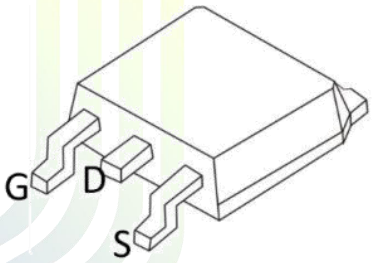



Figure 1 Symbol of VTTL065R17BNA

## Features

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested
- 100% $\Delta V_{DS}$ Tested

## Package Type




**TO-252-2L**

Figure 2 Package Type of VTTL065R17BNA

## Application

- Power Switching Application

## Ordering Information

| Product Name | Package |
|---|---|
| VTTL065R17BNA | TO-252-2L |

## Absolute Maximum Ratings ($T_A$= 25 ºC, unless otherwise specified)

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 650 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±30 | V |
| Continuous Drain Current[Note1] | $T_C$= 25 ºC | $I_D$ | 7 | A |
| Pulsed Drain Current [Note2] | | $I_{DM}$ | 28 | |
| Avalanche Current[Note3] | | $I_{AS}$ | 17.5 | |
| Single Pulsed Avalanche Energy[Note3] | | $E_{AS}$ | 76.5 | mJ |
| Total Power Dissipation[Note5] | $T_C$= 25 ºC | $P_D$ | 54 | W |
| Junction Temperature | | $T_J$ | 150 | ºC |
| Storage Temperature | | $T_{STG}$ | -55 to 150 | ºC |

## Thermal Resistance

| Parameter | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Thermal Resistance, Junction-to-Ambient[Note6] | $R_{\theta JA}$ | | 62.5 | | ºC/W |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | | 2.3 | | ºC/W |

## Electrical Characteristics ($T_J$= 25 ºC, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Statistic Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$= 250uA | 650 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$= 650V, $V_{GS}$=0V | | | 1 | uA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±30V, $V_{DS}$= 0V | | | ±100 | nA |
| Gate Threshold Voltage[Note4] | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 2 | 3.2 | 4 | V |
| Static Drain-Source On-Resistance[Note4] | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$= 1A | | 1.2 | 1.7 | Ω |
| Forward Transconductance[Note4] | $g_{FS}$ | $V_{DS}$=5V, $I_D$= 10A | | 16.5 | | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$=45V | | 1170 | | pF |
| Output Capacitance | $C_{OSS}$ | $V_{GS}$=0V | | 63.9 | | pF |
| Reverse Transfer Capacitance | $C_{RSS}$ | f=1MHz | | 2.6 | | pF |
| Total Gate Charge | $Q_g$ | $V_{DS}$=335V | | 17.1 | | nC |
| Gate-Source Charge | $Q_{gs}$ | $V_{GS}$=10V | | 0.6 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | $I_D$= 1A | | 3.6 | | nC |
| Gate Resistance | Rg | f = 1MHz, Open drain | | 2.1 | | Ω |
| **Switching Parameters** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$= 300V | | 33.6 | | ns |
| Turn-on Rise Time | $t_r$ | $I_D$= 2A | | 7.2 | | ns |
| Turn-off Delay Time | $t_{d(off)}$ | $R_G$=25Ω | | 64 | | ns |
| Turn-off Fall Time | $t_f$ | | | 31.2 | | ns |
| **Diode Characteristics** | | | | | | |
| Diode Forward Voltage [Note4] | $V_{SD}$ | $V_{GS}$=0V, $I_S$= 2A | | | 1.2 | V |

Notes :

1.The maximum current rating is limited by package.And device mounted on a large heatsink.

2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

3.$E_{AS}$ condition: $V_{DD}$ = 100V, $V_{GS}$ = 10V, L = 0.5mH, $R_G$=25Ω Starting $T_J$ = 25°C.

4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

5.The power dissipation $P_D$ is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

6.Device mounted on 1in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$ =25°C.

# Typical Performance Characteristics

Figure 3: Transfer Characteristics

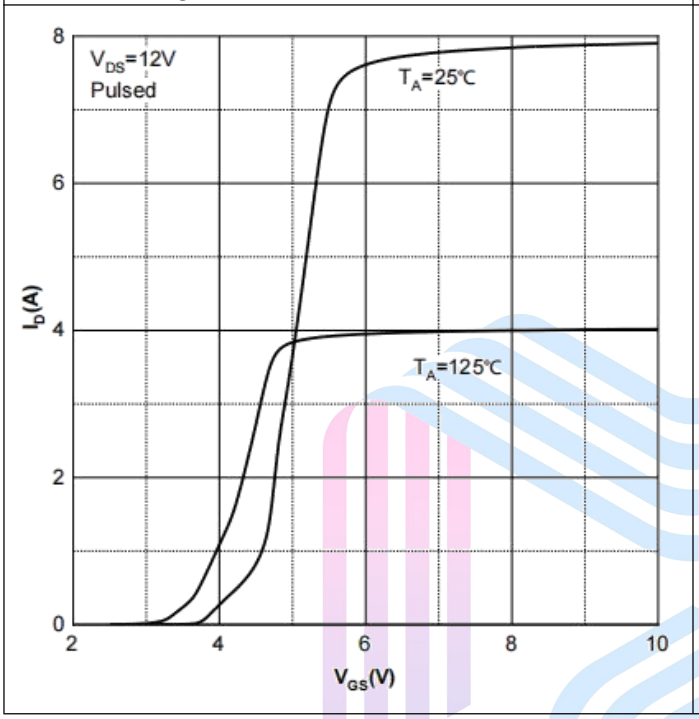



Figure 4: Output Characteristics

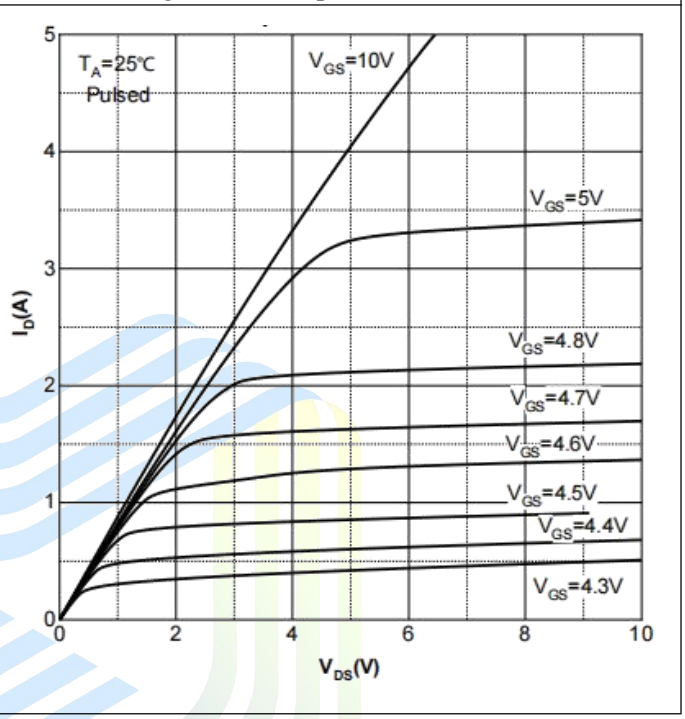



Figure 5: On-Resistance vs. Drain Current

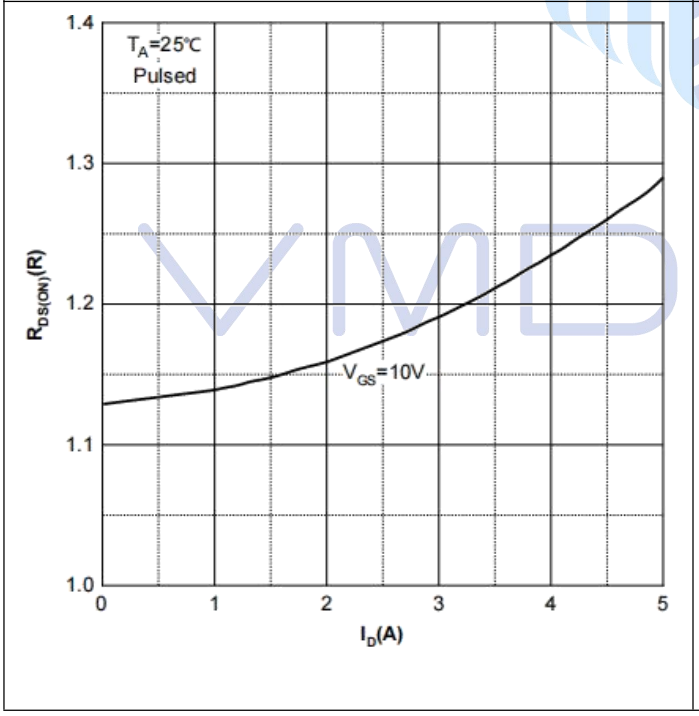



Figure 6: On-Resistance vs. Gate Voltage

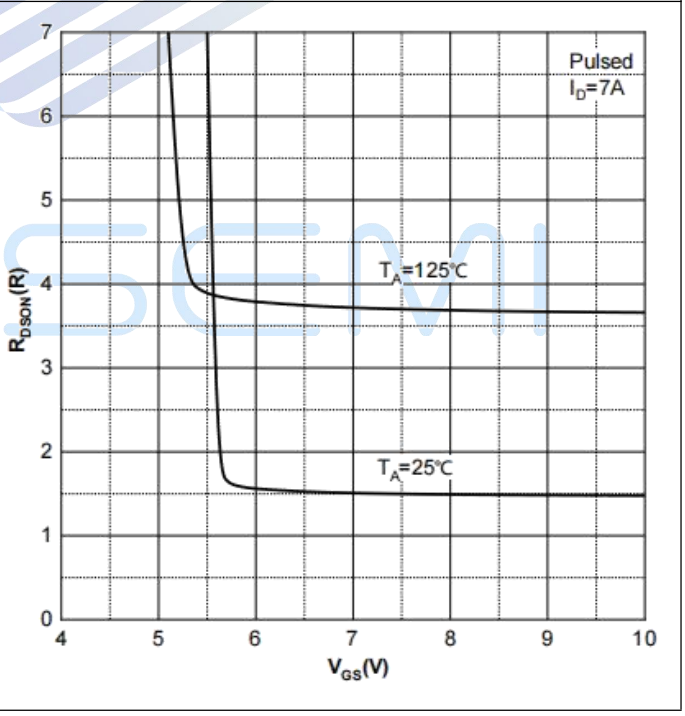


Figure 7: Body Diode Characteristics

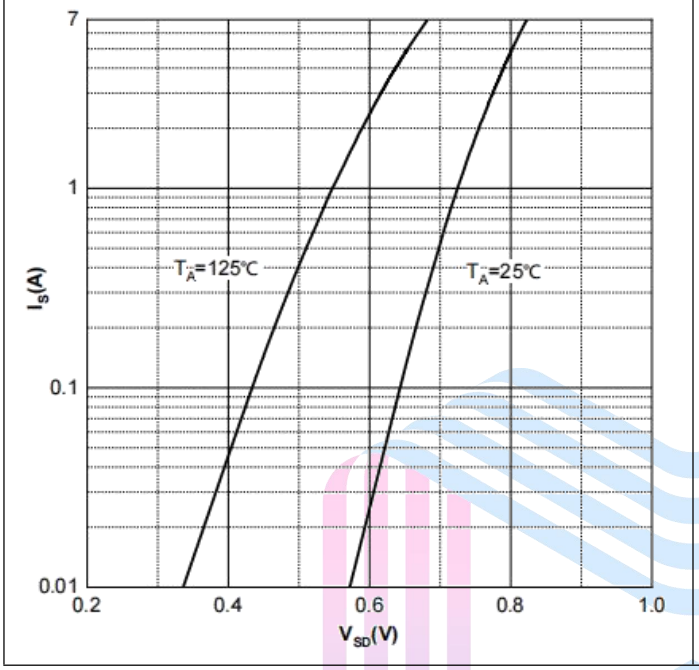
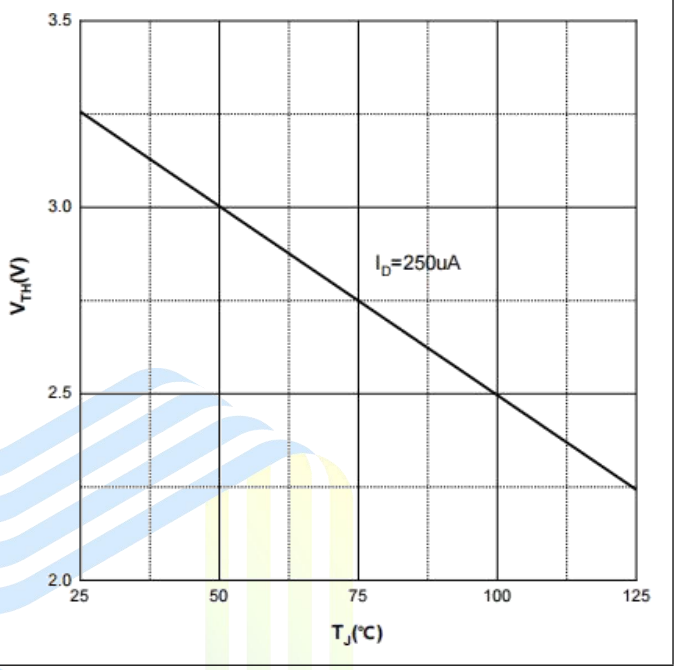
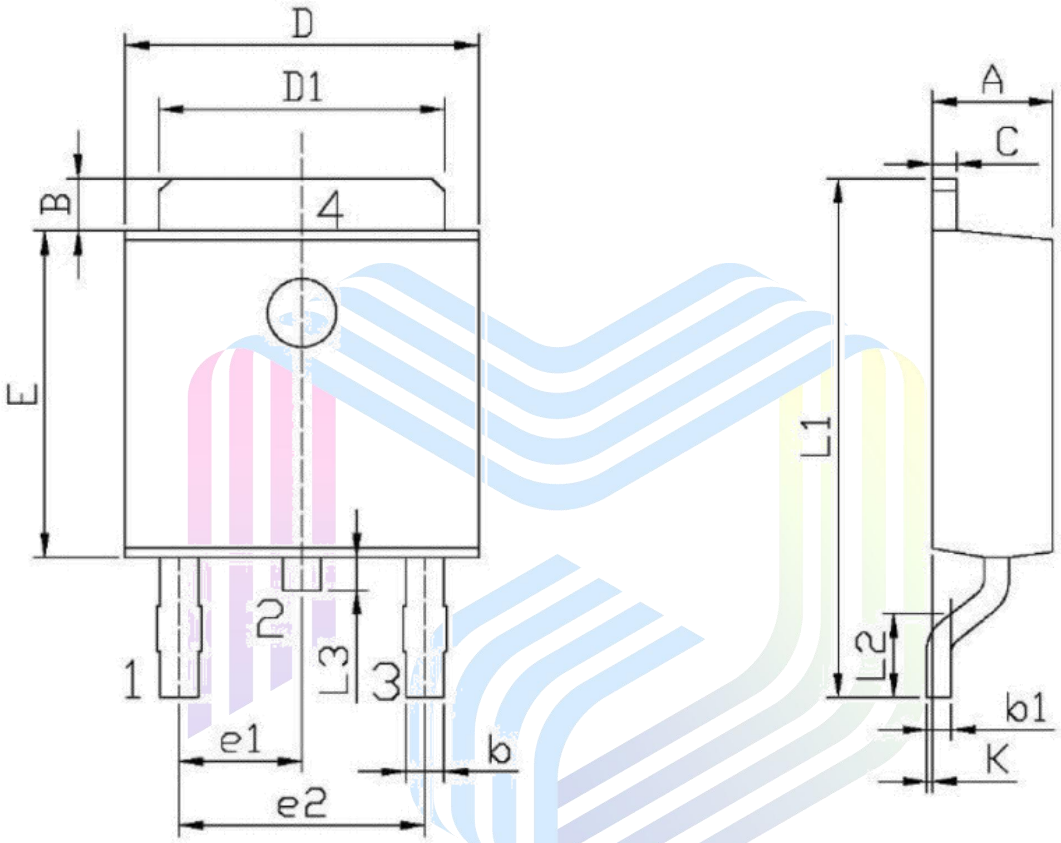



Figure 8: Threshold Voltage



# Mechanical Dimensions:

**TO-220-3L-F Package Information**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| B | 0.950 | 1.250 | 0.037 | 0.049 |
| b | 0.500 | 0.700 | 0.020 | 0.028 |
| b1 | 0.450 | 0.550 | 0.018 | 0.022 |
| C | 0.450 | 0.550 | 0.018 | 0.022 |
| D | 6.450 | 6.750 | 0.254 | 0.266 |
| D1 | 5.100 | 5.500 | 0.201 | 0.217 |
| E | 5.950 | 6.250 | 0.234 | 0.246 |
| e1 | 2.240 | 2.340 | 0.088 | 0.092 |
| e2 | 4.430 | 4.730 | 0.174 | 0.186 |
| L1 | 9.450 | 9.950 | 0.372 | 0.392 |
| L2 | 1.250 | 1.750 | 0.049 | 0.069 |
| L3 | 0.600 | 0.900 | 0.024 | 0.035 |
| K | 0.000 | 0.100 | 0.000 | 0.004 |

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