# CMSBN4506-HF

## Dual N-Channel
## RoHS Device
## Halogen Free

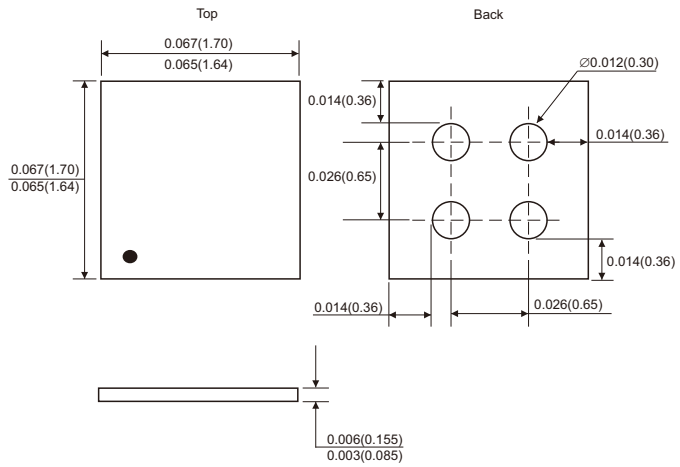
## Features

- It is ESD protected.
- This device is suitable for use as a unidirectional or bi-directional load switch, facilitated by its common-drain configuration.

## Mechanical data

- Case: CSPB1717-4, standard package, molded plastic.

**CSPB1717-4**




Dimensions in inches and (millimeter)

## Pin assignment


Top View

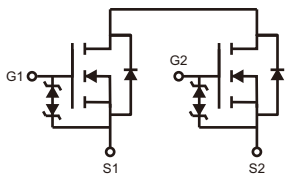
- Solid dot : Pin 1

Bottom View

- Pin 1 : Source 1
- Pin 2 : Gate 1
- Pin 3 : Gate 2
- Pin 4 : Source 2

## Circuit diagram

- G : Gate
- S : Source




## Maximum Ratings (at $T_A$=25°C unless otherwise noted)

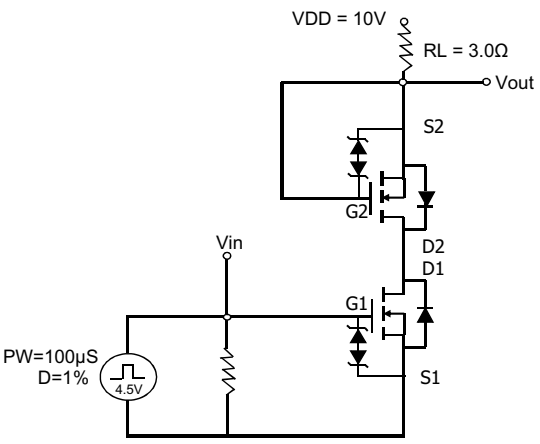
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Source to source voltage | $V_{SSS}$ | 20 | V |
| Gate-source voltage | $V_{GSS}$ | ±12 | V |
| Source current DC (Note 1) | $I_S$ | 10 | A |
| Source current pulse (Note 1, 2) | $I_{SP}$ | 100 | A |
| Total dissipation (Note 1) | $P_T$ | 2.1 | W |
| Channel temperature | $T_{ch}$ | 150 | °C |
| Storage temperature range | $T_{STG}$ | -55 to +150 | |

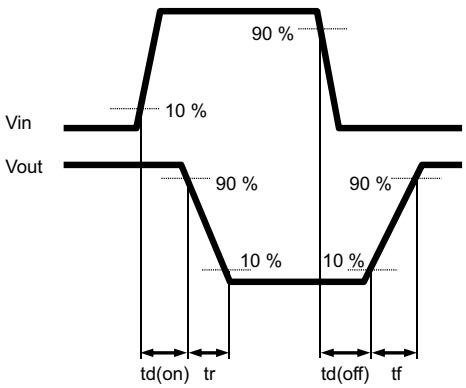
Notes: 1. Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm) using the minimum recommended pad size (36μm copper).
2. t = 10ms, duty cycle = 1 %

## Electrical Characteristics (at $T_A$=25°C unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static parameters** | | | | | | |
| Source to source breakdown voltage | $BV_{SSS}$ | $I_S$ = 1mA, $V_{GS}$ = 0V | 20 | | | V |
| Zero-gate voltage source current | $I_{SSS}$ | $V_{SS}$ = 16V, $V_{GS}$ = 0V | | | 1 | μA |
| Gate to source leakage current | $I_{GSS}$ | $V_{SS}$ = 0V, $V_{GS}$ = ±10V | | | ±10 | μA |
| Gate to source threshold voltage | $V_{GS(th)}$ | $V_{SS}$ = $V_{GS}$, $I_S$ = 250uA | 0.3 | 0.88 | 1.1 | V |
| Source to source on-state resistance | $R_{SS(on)}$ | $V_{GS}$ = 4.5V, $I_S$ = 3A | 7.8 | 11.2 | 13.5 | mΩ |
| | | $V_{GS}$ = 4.0V, $I_S$ = 3A | 8.0 | 11.5 | 14.1 | |
| | | $V_{GS}$ = 3.7V, $I_S$ = 3A | 8.2 | 11.8 | 15.5 | |
| | | $V_{GS}$ = 3.1V, $I_S$ = 3A | 8.9 | 12.7 | 17.0 | |
| | | $V_{GS}$ = 2.5V, $I_S$ = 3A | 10.3 | 14.7 | 21.4 | |
| Input capacitance | $C_{iss}$ | $V_{SS}$ = 10V, $V_{GS}$ = 0V, f = 1kHz | | 1746 | | pF |
| Output capacitance | $C_{oss}$ | | | 260 | | |
| Reverse transfer capacitance | $C_{rss}$ | | | 189 | | |
| Turn-on delay time (Note 3) | $t_{d(on)}$ | $V_{DD}$ = 10V, $R_L$ = 3Ω, $V_{GS}$ = 4.5V | | 0.38 | | μS |
| Turn-on rise time (Note 3) | $t_r$ | | | 0.56 | | |
| Turn-off delay time (Note 3) | $t_{d(off)}$ | | | 2.54 | | |
| Turn-off fall time (Note 3) | $t_f$ | | | 1.01 | | |
| Total gate charge (Note 3) | $Q_g$ | $V_{SS}$ = 10V, $I_S$ = 5A, $V_{GS}$ = 8V | | 28 | | nC |
| Gate1-source1 charge (Note 3) | $Q_{g1s1}$ | | | 3.5 | | |
| Gate1-source2 charge (Note 3) | $Q_{g1s2}$ | | | 6.0 | | |
| Diode forward voltage | $V_{F(S-S)}$ | $V_{GS}$ = 0V, $I_S$ = 1A | | | 1.0 | V |

Notes: 3. When FET1 is measured,G2 and S2 are short-circuited.



## Rating and Characteristic Curves (CMSBN4506-HF)

Fig.1 - $I_S$ — $V_{SS}$

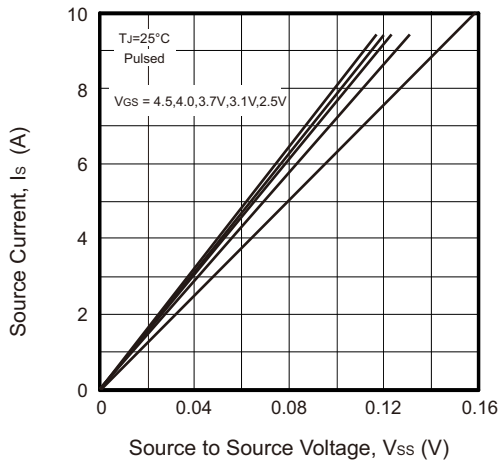



Fig.2 - $I_S$ — $V_{GS}$

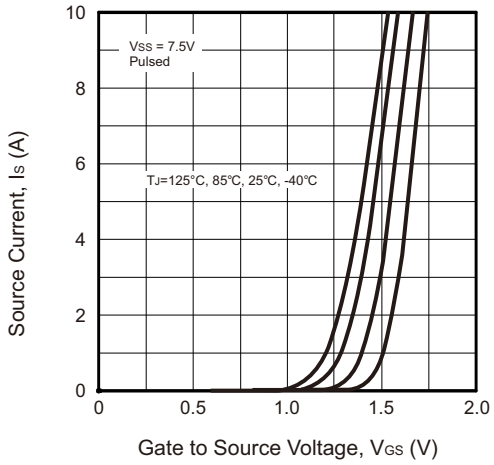



Fig.3 - $R_{SS(on)}$ — $I_S$

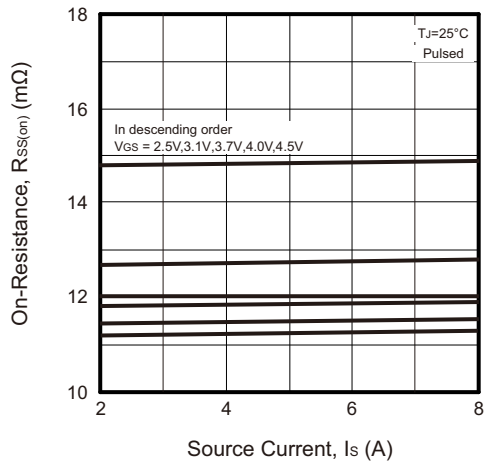



Fig.4 - $R_{SS(on)}$ — $V_{GS}$

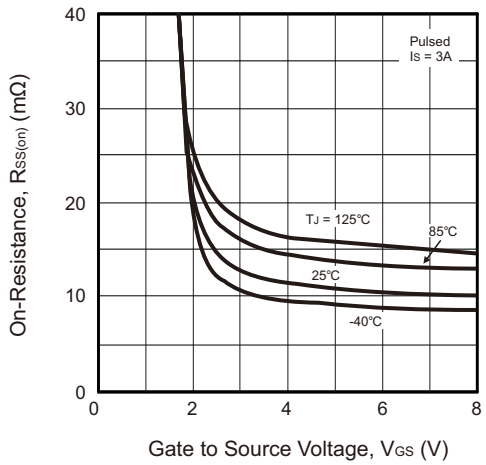



Fig.5 - $I_F$ — $V_F$

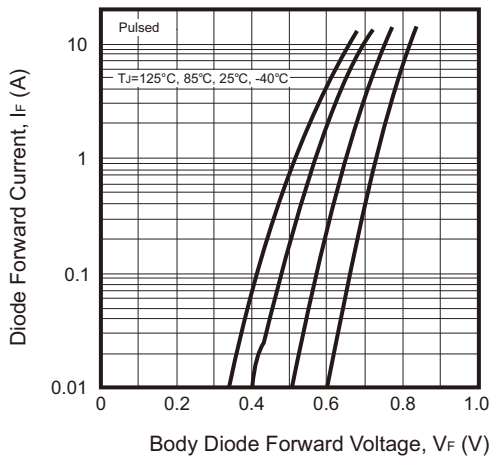
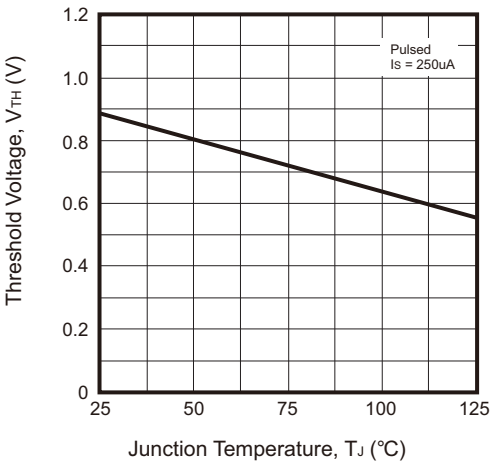



Fig.8 - Threshold Voltage



## Rating and Characteristic Curves (CMSBN4506-HF)

Fig.7 - Capacitance

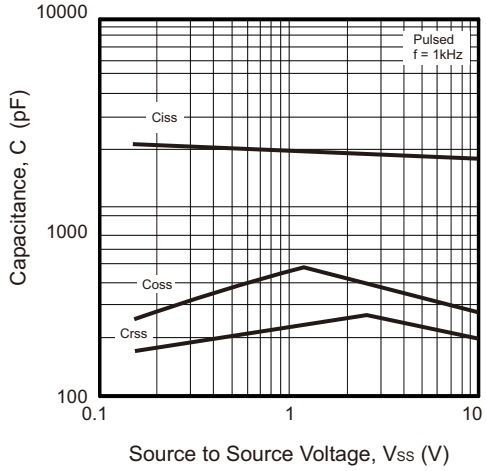



Fig.8 - Gate Charge

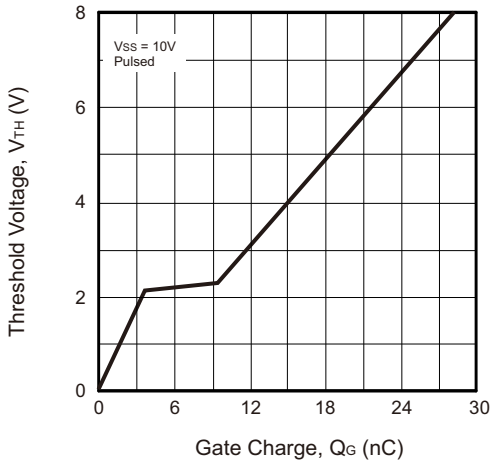



Fig.9 - Normalized Traisient Thermal Impendance

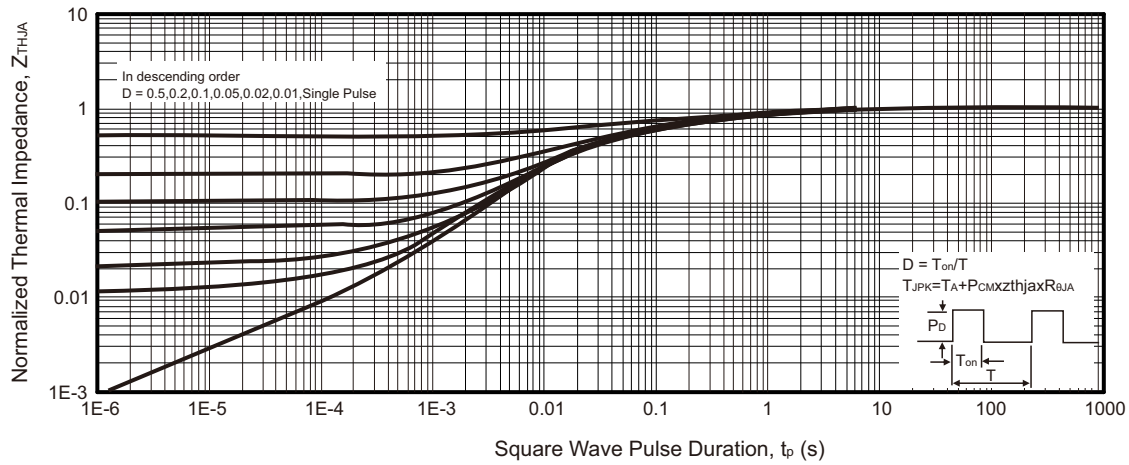



Fig.10 - Maximum Forward Biased Safe Operating Area