

**CMSBN4502-HF**

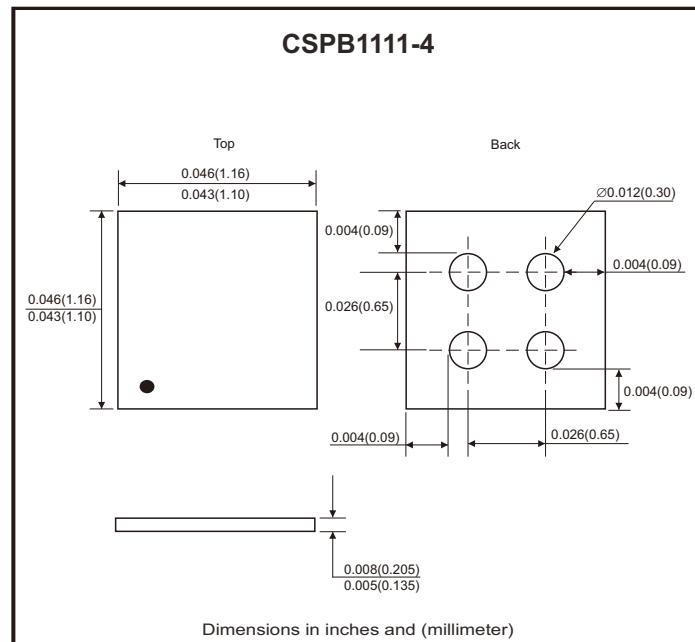
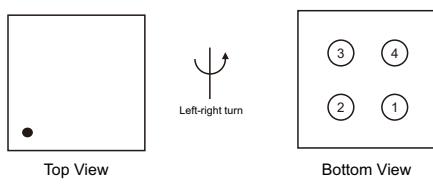
**Dual N-Channel**  
**RoHS Device**  
**Halogen Free**

**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.

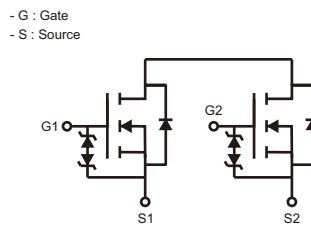
**Mechanical data**

- Case: CSPB1111-4, standard package, molded plastic.

**Pin assignment**

- Solid dot : Pin 1

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

**Circuit diagram****Maximum Ratings** (at TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Source to source voltage	V <sub>SSS</sub>	20	V
Gate-source voltage	V <sub>GSS</sub>	±12	V
Source current DC (Note 1)	I <sub>S</sub>	3.5	A
Source current pulse (Note 1, 2)	I <sub>SP</sub>	35	A
Total dissipation (Note 1)	P <sub>T</sub>	2.5	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature range	T <sub>STG</sub>	-55 to +150	

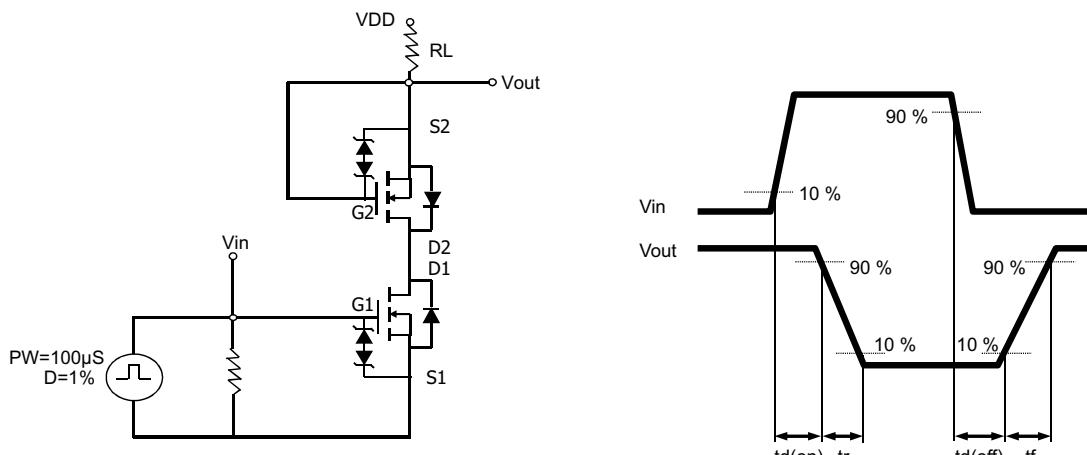
Notes: 1. Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm) using the minimum recommended pad size (36μm copper).

2. t = 10ms, duty cycle = 1 %

## Electrical Characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Static parameters</b>						
Source to source breakdown voltage	$\text{BV}_{\text{ss}}$	$I_s = 1\text{mA}, V_{\text{GS}} = 0\text{V}$	20			V
Zero-gate voltage source current	$I_{\text{SS}}$	$V_{\text{SS}} = 16\text{V}, V_{\text{GS}} = 0\text{V}$			1	$\mu\text{A}$
Gate to source leakage current	$I_{\text{GSS}}$	$V_{\text{SS}} = 0\text{V}, V_{\text{GS}} = \pm 10\text{V}$			$\pm 10$	$\mu\text{A}$
Gate to source threshold voltage	$V_{\text{GS(th)}}$	$V_{\text{SS}} = V_{\text{GS}}, I_s = 250\mu\text{A}$	0.5	0.8	1.3	V
Source to source on-state resistance	$R_{\text{SS(on)}}$	$V_{\text{GS}} = 4.5\text{V}, I_s = 2\text{A}$	15.8	22.6	31	$\text{m}\Omega$
		$V_{\text{GS}} = 4.1\text{V}, I_s = 2\text{A}$	16.0	22.9	33	
		$V_{\text{GS}} = 4.0\text{V}, I_s = 2\text{A}$	16.2	23.1	34	
		$V_{\text{GS}} = 3.8\text{V}, I_s = 2\text{A}$	16.3	23.3	35	
		$V_{\text{GS}} = 3.7\text{V}, I_s = 2\text{A}$	16.5	23.6	36	
		$V_{\text{GS}} = 3.1\text{V}, I_s = 2\text{A}$	17.5	25.0	39	
		$V_{\text{GS}} = 2.5\text{V}, I_s = 2\text{A}$	19.4	27.7	48	
Input capacitance	$C_{\text{iss}}$	$V_{\text{SS}} = 10\text{V}, V_{\text{GS}} = 0\text{V}, f = 1\text{kHz}$		644		$\text{pF}$
Output capacitance	$C_{\text{oss}}$			150		
Reverse transfer capacitance	$C_{\text{rss}}$			109		
Turn-on delay time (Note 3)	$t_{\text{d(on)}}$	$V_{\text{DD}} = 9\text{V}, R_{\text{L}} = 2.8\Omega, V_{\text{GS}} = 4.5\text{V}$		113		$\text{nS}$
Turn-on rise time (Note 3)	$t_{\text{r}}$			246		
Turn-off delay time (Note 3)	$t_{\text{d(off)}}$			1160		
Turn-off fall time (Note 3)	$t_{\text{f}}$			516		
Total gate charge (Note 3)	$Q_g$	$V_{\text{SS}} = 10\text{V}, I_s = 3.4\text{A}, V_{\text{GS}} = 6\text{V}$		8.6		$\text{nC}$
Gate1-source1 charge (Note 3)	$Q_{g1s1}$			0.9		
Gate1-source2 charge (Note 3)	$Q_{g1s2}$			2.5		
Diode forward voltage	$V_{\text{F(s-s)}}$	$V_{\text{GS}} = 0\text{V}, I_s = 2\text{A}$			1.0	V

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



# CSP Enhancement Mode Power MOSFET

**Comchip**  
SMD Diode Specialist

## Rating and Characteristic Curves (CMSBN4502-HF)

Fig.1 -  $I_s$  —  $V_{ss}$

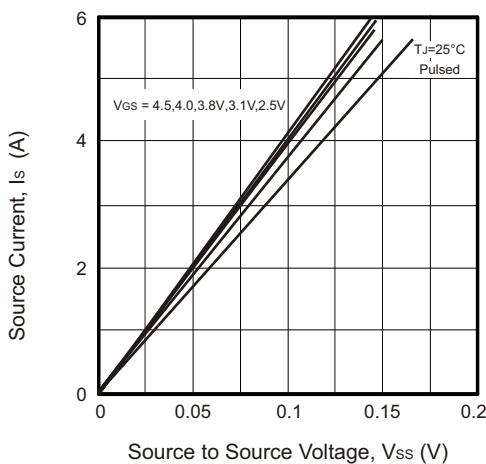


Fig.2 -  $I_s$  —  $V_{gs}$

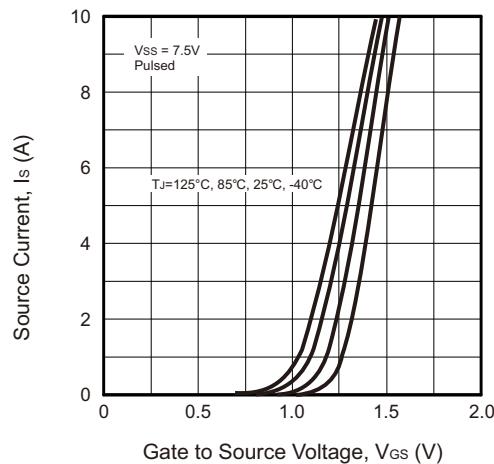


Fig.3 -  $R_{SS(on)}$  —  $I_s$

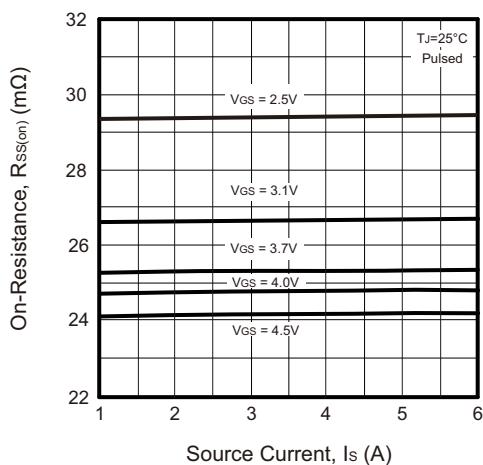


Fig.4 -  $R_{SS(on)}$  —  $V_{gs}$

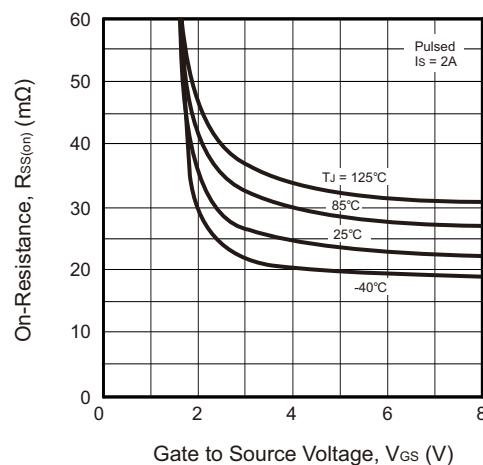


Fig.5 -  $I_F$  —  $V_F$

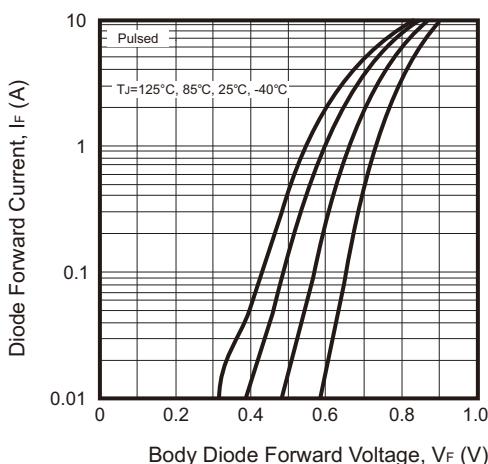
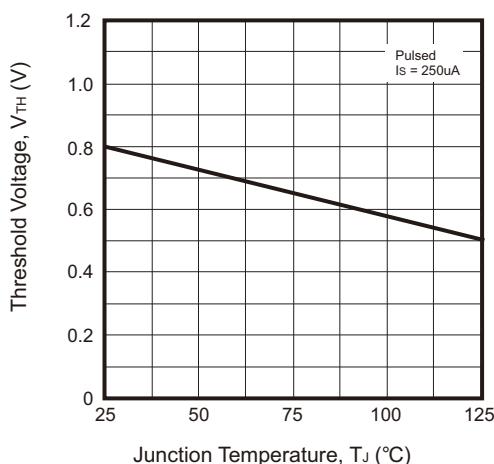


Fig.8 - Threshold Voltage



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## Rating and Characteristic Curves (CMSBN4502-HF)

Fig.7 - Capacitance

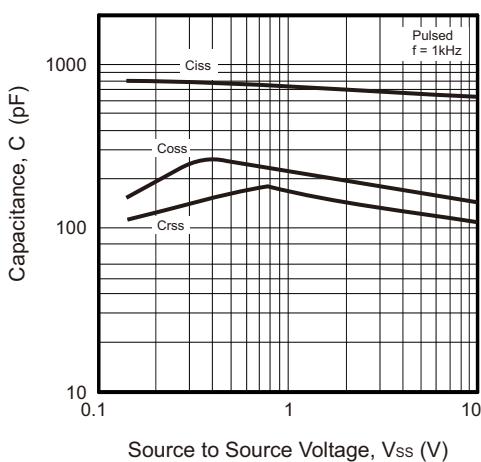


Fig.8 - Gate Charge

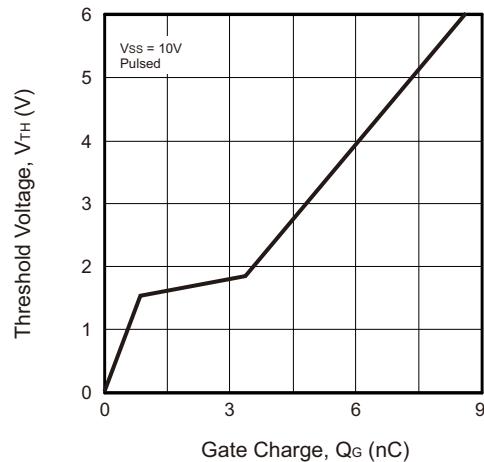


Fig.9 - Normalized Transient Thermal Impedance

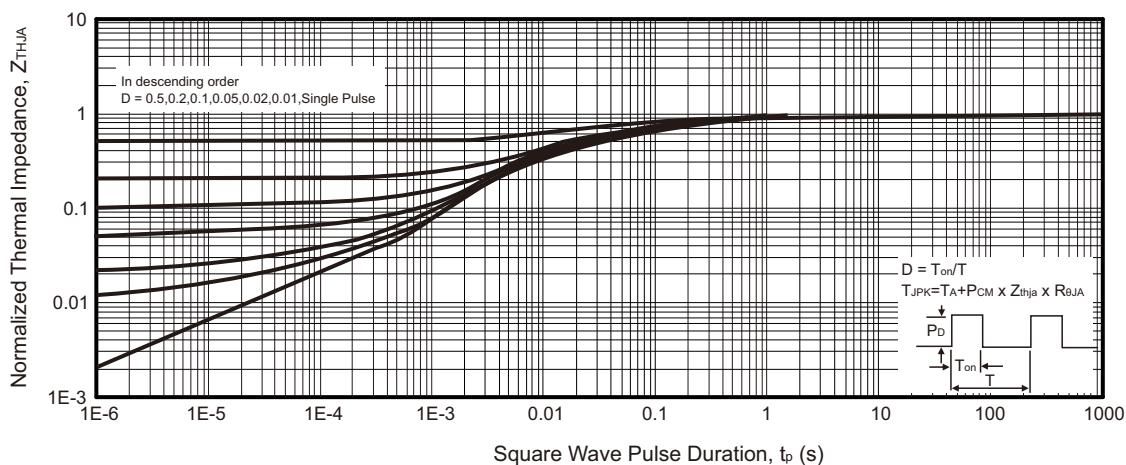


Fig.10 - Maximum Forward Biased Safe Operating Area

