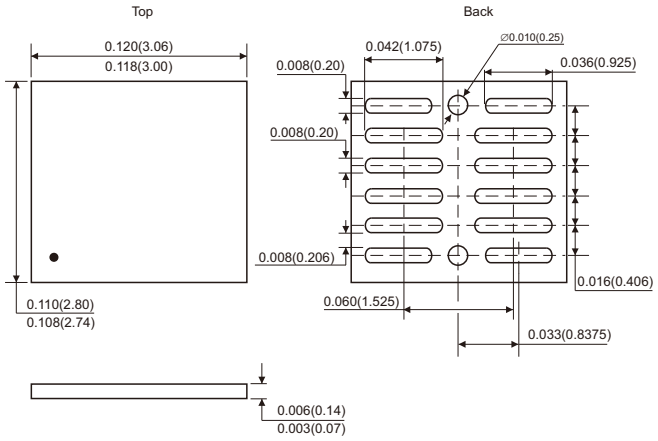
CMSBN12209-HF

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.

CSPC3028-14



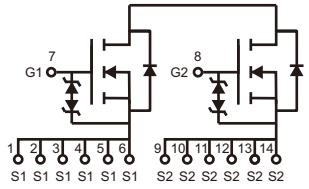
Dimensions in inches and (millimeter)

Mechanical data

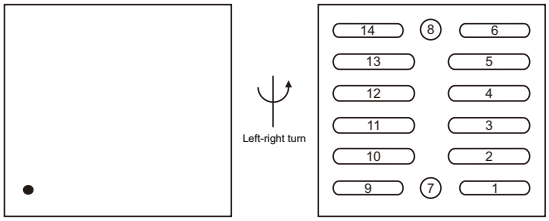
- Case: CSPC3028-14, standard package, molded plastic.

Circuit Diagram

- G : Gate
- S : Source



Pin Assignment



Top View
- Solid dot : Pin 1

Bottom View
- Pin 1, 2, 3, 4, 5, 6 : Source 1
- Pin 9, 10, 11, 12, 13, 14 : Source 2
- Pin 7 : Gate 1
- Pin 8 : Gate 2

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

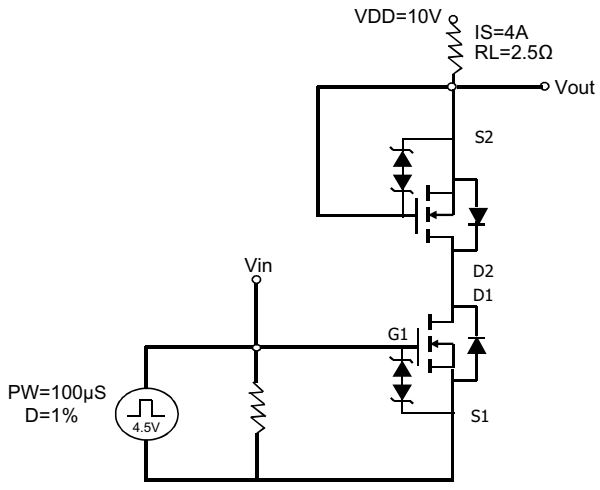
Parameter	Symbol	Value	Unit
Source to source voltage	V_{SSS}	12	V
Gate-source voltage	V_{GS}	±8	V
Source current DC (Note 1)	I_S	19.8	A
Source current pulse (Note 1, 2)	I_{SP}	198	A
Total power dissipation (Note 1)	P_T	3.1	W
Channel temperature	T_{ch}	150	°C
Storage temperature range	T_{STG}	-55 to +150	

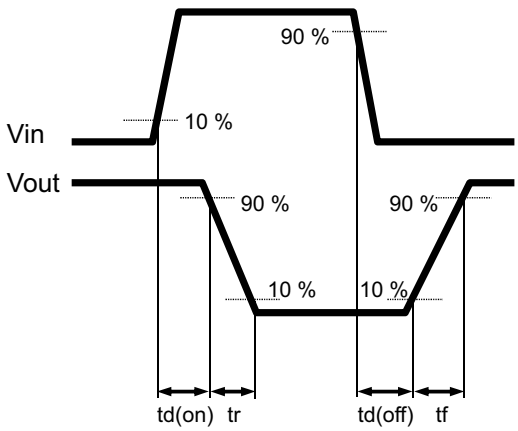
Notes: 1. Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm) using the minimum recommended pad size (36μm copper).
2. t = 10ms, duty cycle ≤ 1 %

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	12			V
Zero-gate voltage source current	I_{SSS}	V_{SS} = 10V, V_{GS} = 0V			1	μA
Gate to source leakage current	I_{GSS}	V_{SS} = 0V, V_{GS} = ±8V			±10	μA
Gate to source threshold voltage (Note 1)	V_{TH}	V_{S2S1} = 6V, I_{S1} = 2.3mA	0.35	0.77	1.4	V
		V_{S1S2} = 6V, I_{S2} = 2.3mA				
Source to source on-state resistance	$R_{SS(on)}$	V_{GS} = 4.5V, I_S = 3A	0.8	1.2	1.56	mΩ
		V_{GS} = 3.8V, I_S = 3A	0.9	1.3	1.69	
		V_{GS} = 3.1V, I_S = 3A	1.0	1.4	1.82	
		V_{GS} = 2.5V, I_S = 3A	1.1	1.6	3.20	
Input capacitance	C_{iss}	V_{SS} = 10V, V_{GS} = 0V, f = 1kHz		6315		pF
Output capacitance	C_{oss}			1393		
Reverse transfer capacitance	C_{rss}			1106		
Turn-on delay time (Note 1)	$t_{d(on)}$	V_{DD} = 10V, I_S = 4A, V_{GS} = 4.5V		1.2		μS
Turn-on rise time (Note 1)	t_r			5.7		
Turn-off delay time (Note 1)	$t_{d(off)}$			11		
Turn-off fall time (Note 1)	t_f			15.4		
Total gate charge (Note 1)	Q_g	V_{SS} = 10V, I_S = 10A, V_{GS} = 4.5V		75		nC
Gate1-source1 charge (Note 1)	Q_{g1s1}			15		
Gate1-source2 charge (Note 1)	Q_{g1s2}			36		
Diode forward voltage	$V_{F(S-S)}$	V_{G1S1} = 0V, V_{G2S2} = 4.5V, I_S = 3A			1.0	V
		V_{G1S1} = 4.5V, V_{G2S2} = 0V, I_S = 3A				

Notes: 1. When FET1 is measured, G2 and S2 are short-circuited.





Typical Rating and Characteristic Curves (CMSBN12209-HF)

Fig.1 - I_S — V_{SS}

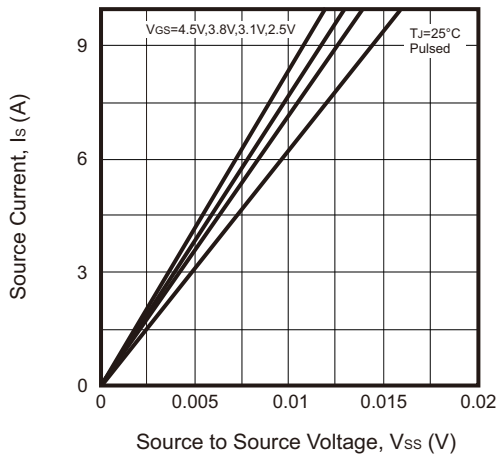


Fig.2 - I_S — V_{GS}

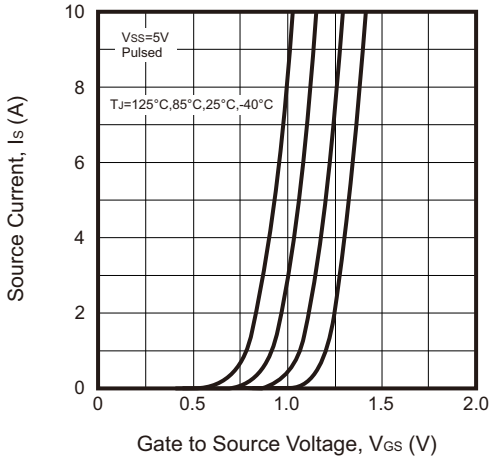


Fig.3 - $R_{SS(ON)}$ — I_S

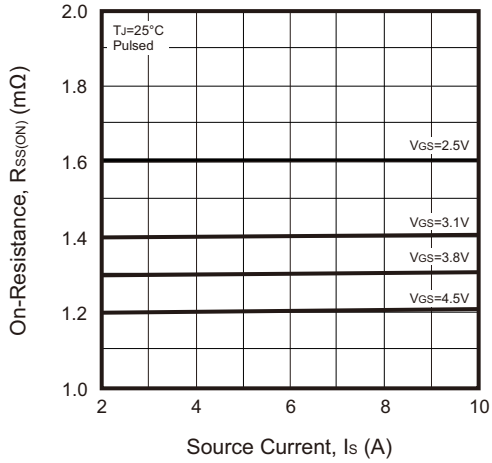


Fig.4 - $R_{SS(ON)}$ — V_{GS}

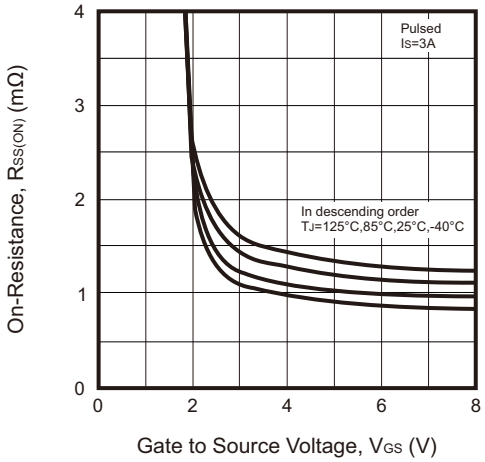


Fig.5 - I_F — V_F

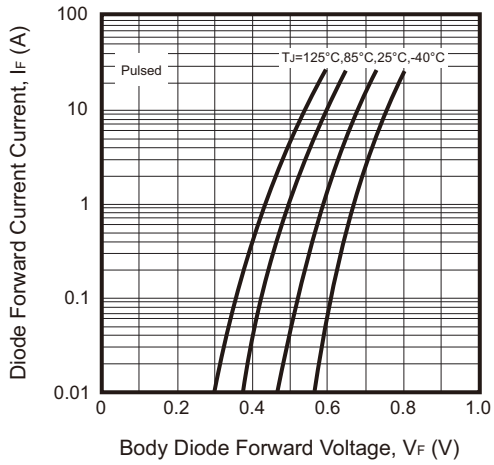
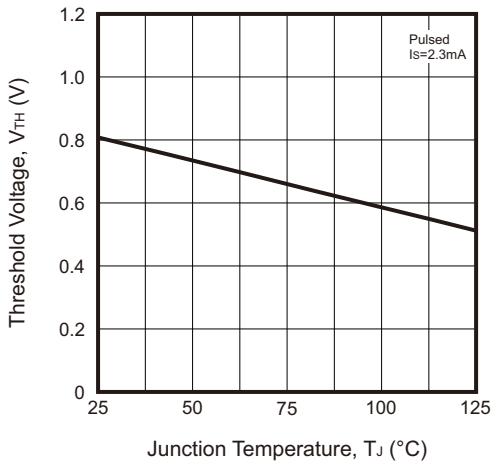


Fig.6 - Threshold Voltage



Typical Rating and Characteristic Curves (CMSBN12209-HF)

Fig.7 - Capacitances

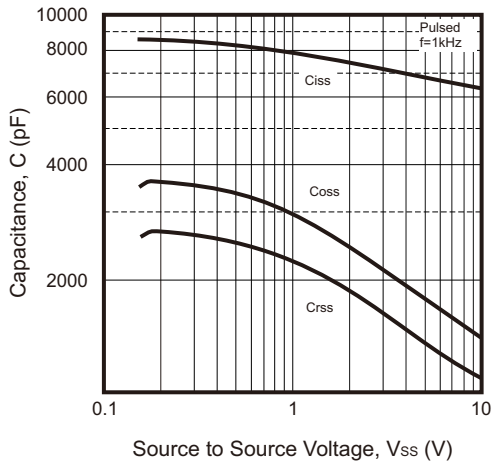


Fig.8 - Gate Charge

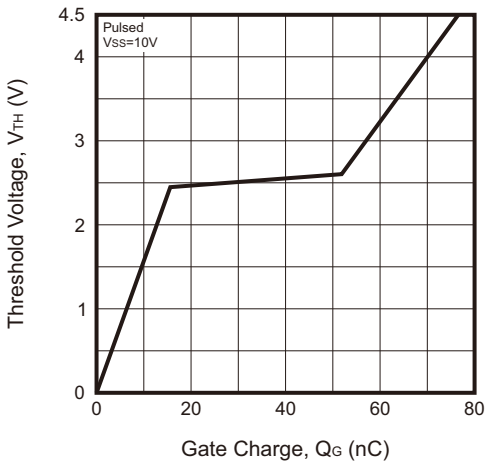
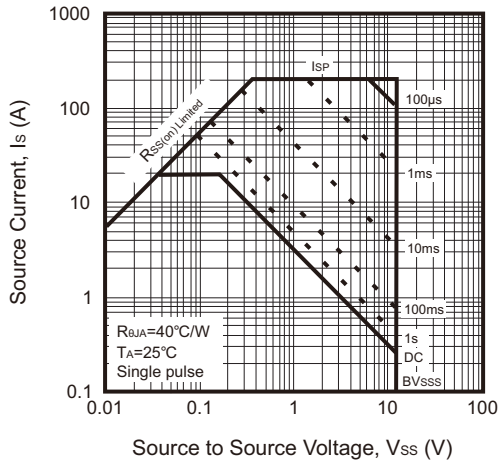
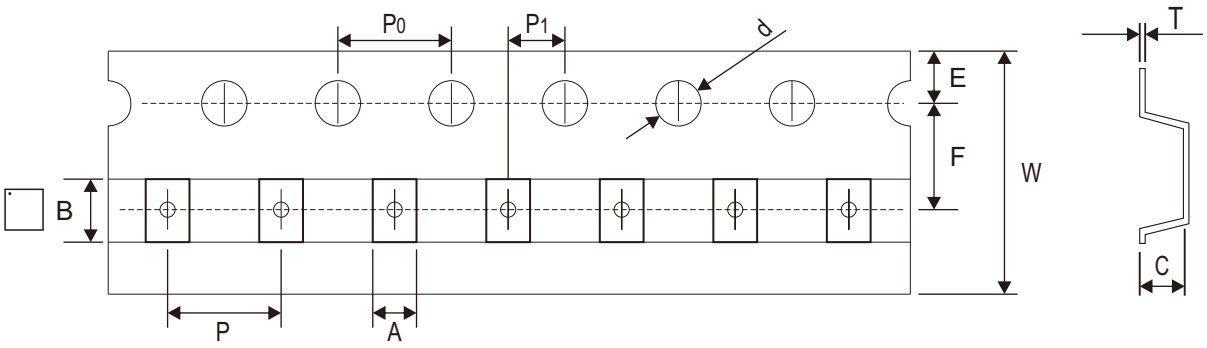
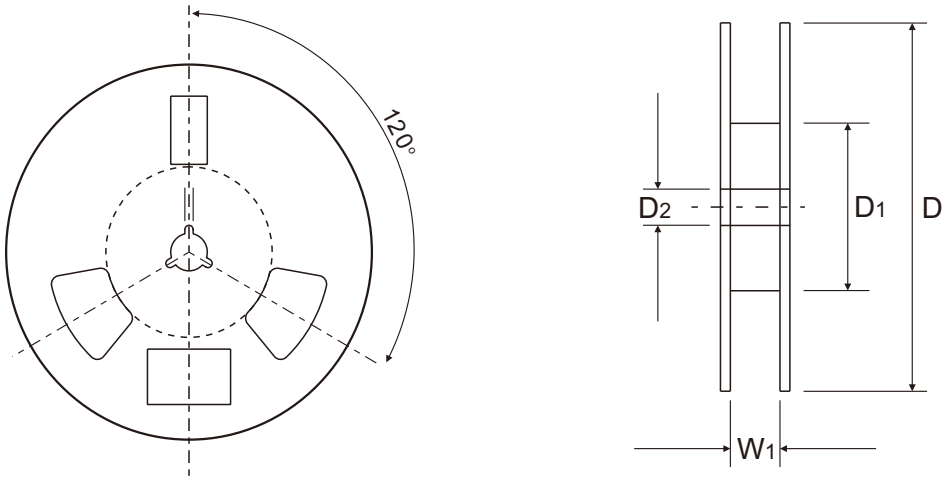


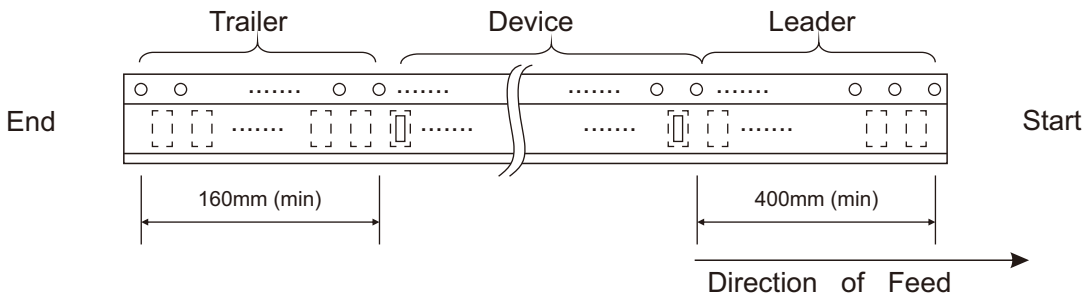
Fig.9 - Maximum Forward Biased Safe Operating Area



Reel Taping Specification





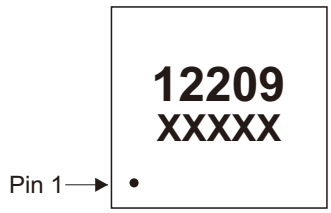


	SYMBOL	A	B	C	d	D	D1	D2
CSPC3028-14	(mm)	2.96 ± 0.05	3.22 ± 0.05	0.23 ± 0.05	1.50 + 0.10	178.00 ± 2.00	55.00 ± 1.00	13.00 + 0.35 − 0.15
	(inch)	0.117 ± 0.002	0.127 ± 0.002	0.009 ± 0.002	0.059 + 0.004	7.008 ± 0.079	2.165 ± 0.039	0.512 + 0.014 − 0.006

	SYMBOL	E	F	P	P0	P1	T	W	W1
CSPC3028-14	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.20 ± 0.05	8.00 ± 0.15	8.65 + 4.70 − 0.65
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.008 ± 0.002	0.315 ± 0.006	0.341 + 0.185 − 0.026

Marking Code

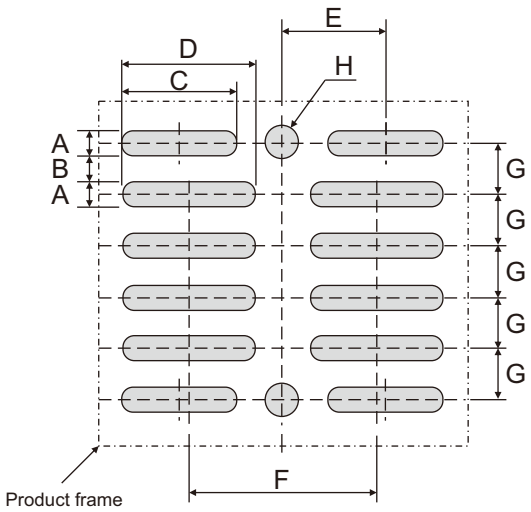
Part Number	Marking Code
CMSBN12209-HF	12209



XXXXX = Control code

Suggested P.C.B. PAD Layout

SIZE	CSPC3028-14	
	(mm)	(inch)
A	0.20	0.008
B	0.206	0.008
C	0.925	0.036
D	1.075	0.042
E	0.8375	0.033
F	1.525	0.060
G	0.406	0.016
H	0.25	0.010



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
CSPC3028-14	5,000	7