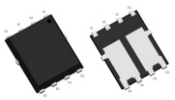
MOSFET

CMS20NN10H8-HF

Dual N-Channel
RoHS Device
Halogen Free



Features

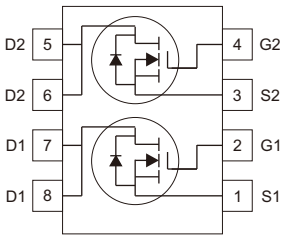
- Low gate charge.
- Fast switching characteristic.

Mechanical data

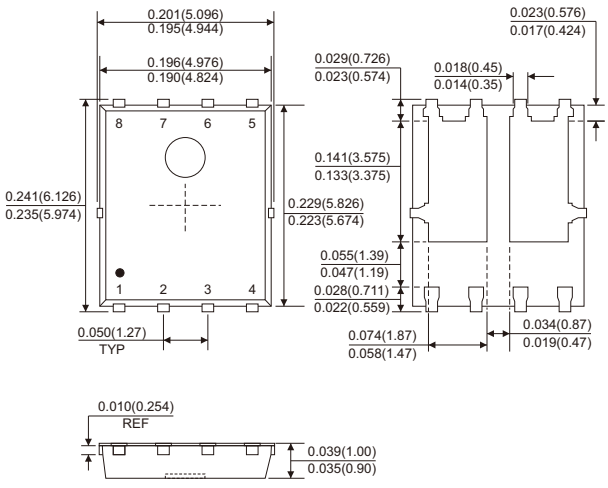
- Case: PDFN5x6-8L, molded plastic.
- Mounting position: Any.

Circuit Diagram

G:Gate
S:Source
D:Drain



PDFN5x6-8L



Dimensions in inches and (millimeter)

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

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current (Note 1)	V_{GS} = 10V, T_C = 25°C (silicon limit)	I_D	20	A
	V_{GS} = 10V, T_C = 25°C (package limit)		14	
	V_{GS} = 10V, T_C = 100°C		13	
Continuous drain current (Note 2)	V_{GS} = 10V, T_A = 25°C		5.2	
	V_{GS} = 10V, T_A = 70°C		4.2	
Pulsed drain current (Note 3)		I_{DM}	56	A
Continuous body diode forward current @ T_C = 25°C (Note 1)		I_S	14	A
Pulsed body diode forward current @ T_C = 25°C		I_{SM}	56	A
Avalanche current @ L=0.1mH		I_{AS}	15	A
Avalanche energy @ L=0.5mH		E_{AS}	25	mJ
Total power dissipation (Note 1)	T_C = 25°C	P_D	28	W
	T_C = 100°C		11	
Total power dissipation (Note 2)	T_A = 25°C		1.9	
	T_A = 70°C		1.2	
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +150	°C

Thermal Data

Parameter	Symbol	Steady state	Unit
Thermal resistance, junction to case	$R_{\theta JC}$	4.5	°C/W
Thermal resistance, junction to ambient (Note 2)	$R_{\theta JA}$	67	°C/W

Notes: 1. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for case where additional heatsinking is used.

2. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temp erature of 150°C. The value in any given application depends on the user's specific board design.

3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Rating are based on low frequency and low duty cycles to keep initial T_J=25°C.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	100			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1		2.5	V
Forward transconductance	G_{FS}	V_{DS} = 10V, I_D = 5A		12		S
Gate-source leakage	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V			1	μA
Static Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 5A		25	32	mΩ
		V_{GS} = 4.5V, I_D = 4A		30	45	
Dynamic						
Input capacitance	C_{iss}	V_{DS} = 50V, V_{GS} = 0V, f = 1MHz		1100		pF
Output capacitance	C_{oss}			110		
Reverse transfer capacitance	C_{rss}			25		
Gate resistance	Rg	f = 1MHz		1.3		Ω
Total gate charge (Note 1, 2)	Q_g	V_{DS} = 50V, I_D = 5A, V_{GS} = 4.5V		9.8		nC
Total gate charge (Note 1, 2)	Q_g	V_{DS} = 50V, I_D = 5A, V_{GS} = 10V		18		
Gate-source charge (Note 1, 2)	Q_{gs}			3.6		
Gate-drain charge (Note 1, 2)	Q_{gd}			3.7		
Turn-on delay time (Note 1, 2)	$t_{d(ON)}$	V_{DS} = 50V, I_D = 5A, V_{GS} = 10V, R_{GS} = 1Ω		10		ns
Rise time (Note 1, 2)	t_r			11		
Turn-off delay time (Note 1, 2)	$t_{d(OFF)}$			23		
Fall time (Note 1, 2)	t_f			11		
Source-Drain Diode						
Diode forward voltage (Note 1)	V_{SD}	I_S = 5A, V_{GS} = 0V		0.8	1.2	V
Reverse recovery time	t_{rr}	I_F = 5A, dI_F/dt = 100A/μs		30		ns
Recovered charge	Q_{rr}			36		nC

Notes: 1. Pulse width ≤ 300μs, duty cycle ≤ 2%.
2. Independent of operating temperature.

Typical Rating and Characteristic Curves (CMS20NN10H8-HF)

Fig.1 - Typical Output Characteristics

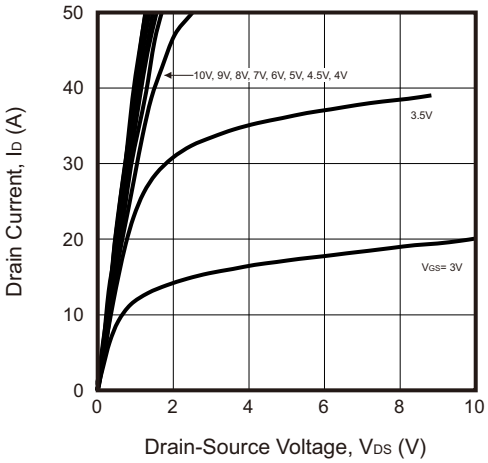


Fig.2 - Breakdown Voltage vs Ambient Temperature

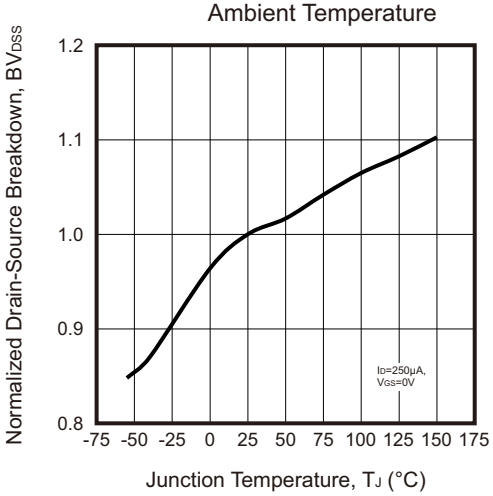


Fig.3 - Static Drain-Source On-State Resistance vs Drain Current

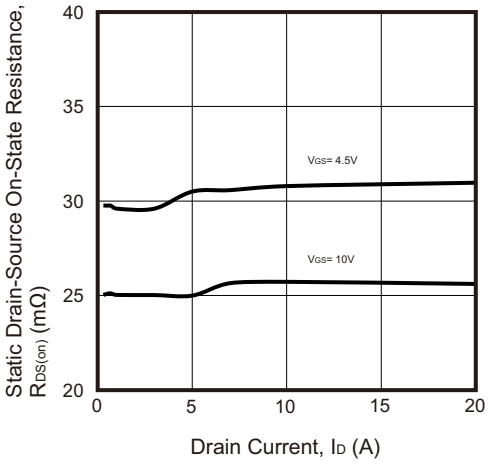


Fig.4 - Body Diode Current vs Source-Drain Voltage

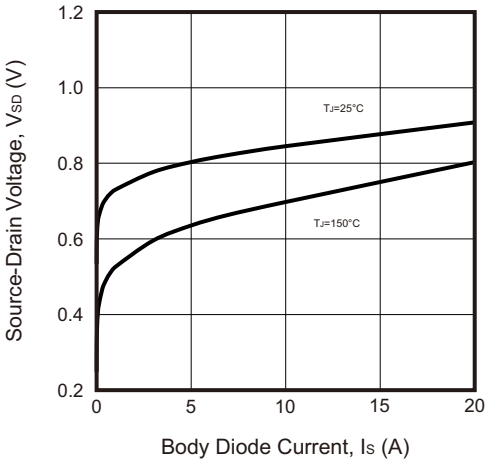


Fig.5 - Static Drain-Source On-State Resistance vs Gate-Source Voltage

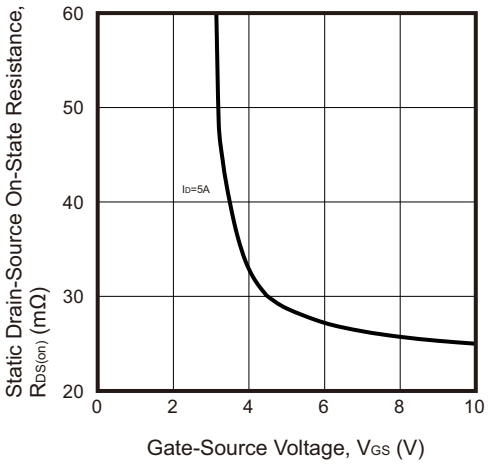
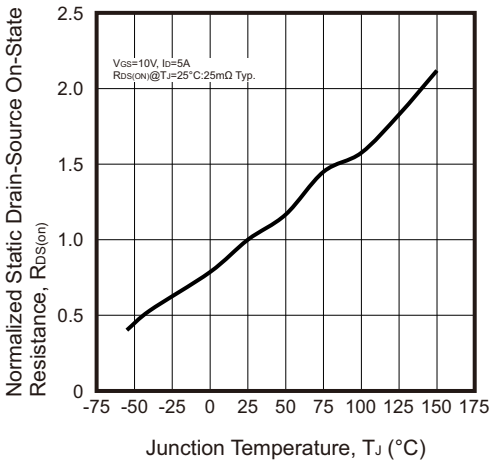


Fig.6 - Drain-Source On-State Resistance vs Junction Temperature



Typical Rating and Characteristic Curves (CMS20NN10H8-HF)

Fig.7 - Capacitance vs Drain-to-Source Voltage

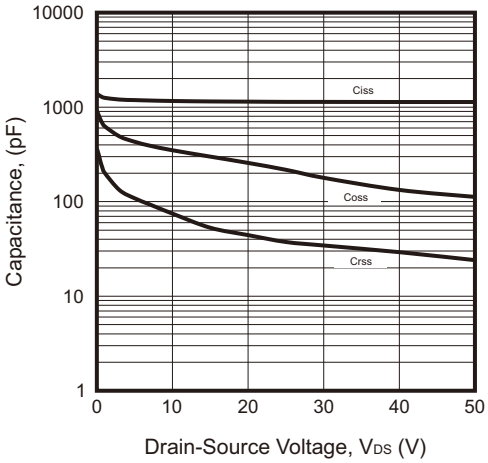


Fig.8 - Threshold Voltage vs Junction Temperature

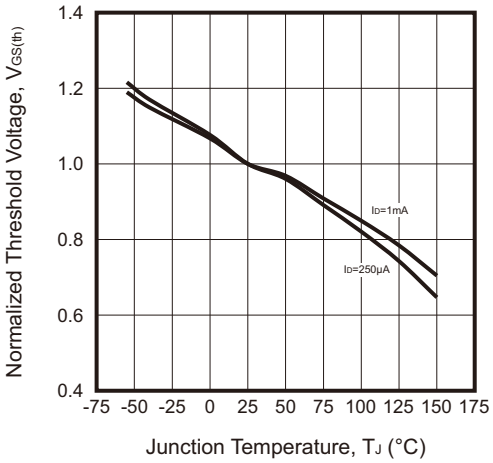


Fig.9 - Forward Transfer Admittance vs Drain Current

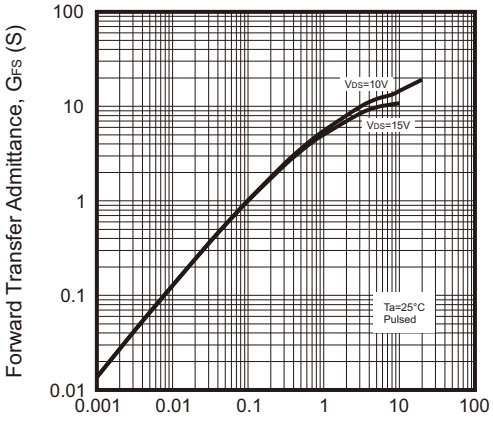


Fig.10 - Gate Charge Characteristics

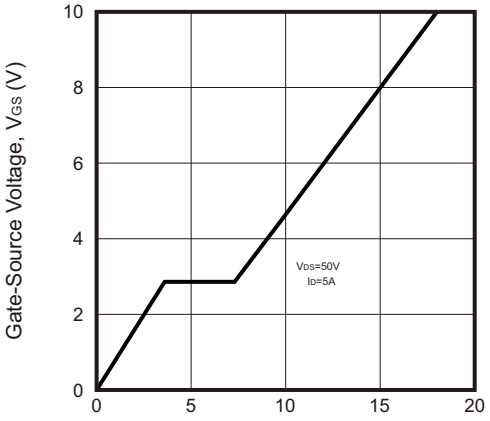


Fig.11 - Maximum Safe Operating Area

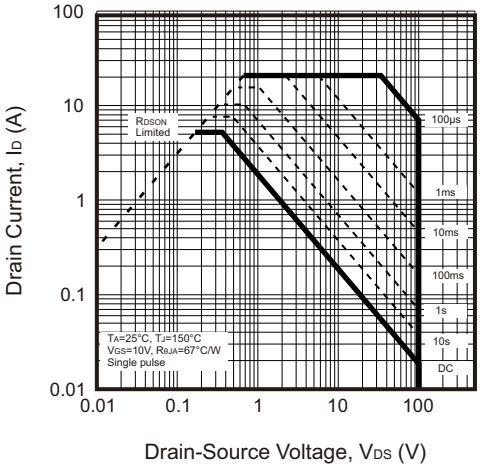
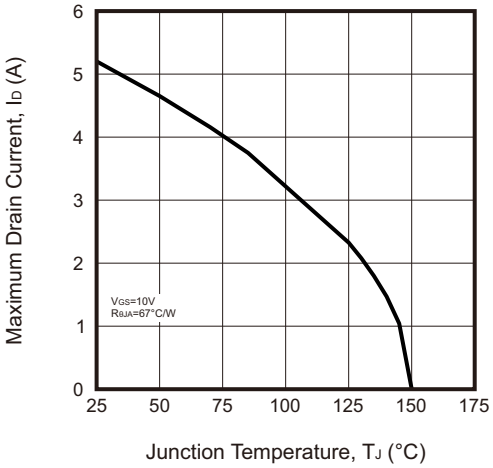


Fig.12 - Maximum Drain Current vs Junction Temperature



Typical Rating and Characteristic Curves (CMS20NN10H8-HF)

Fig.13 - Single Pulse Power Rating, Junction to Ambient

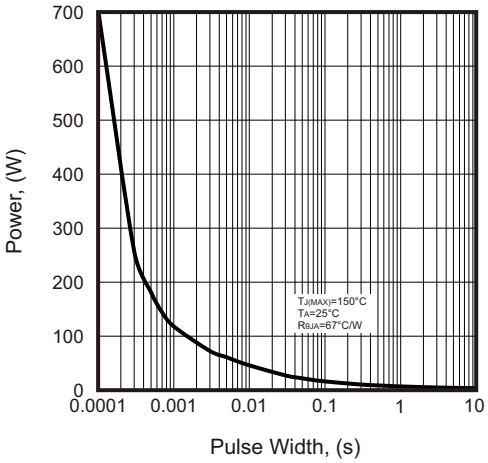
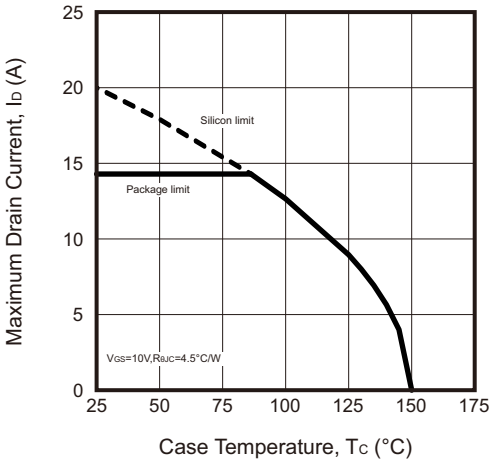
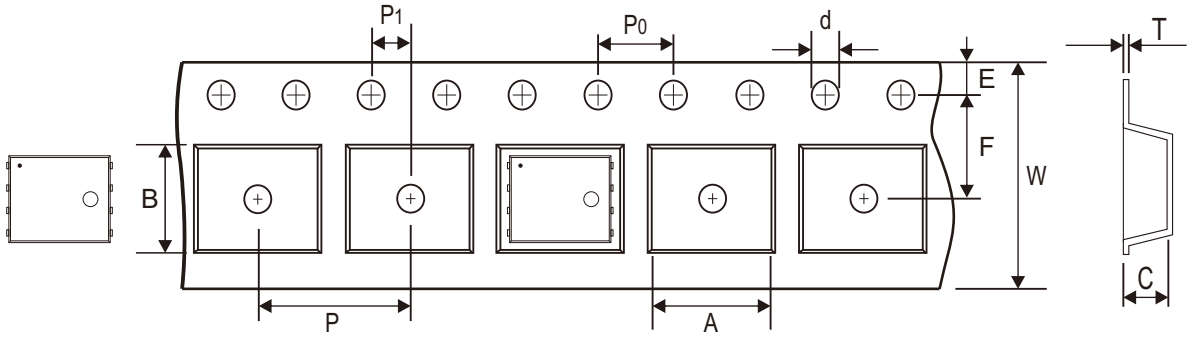
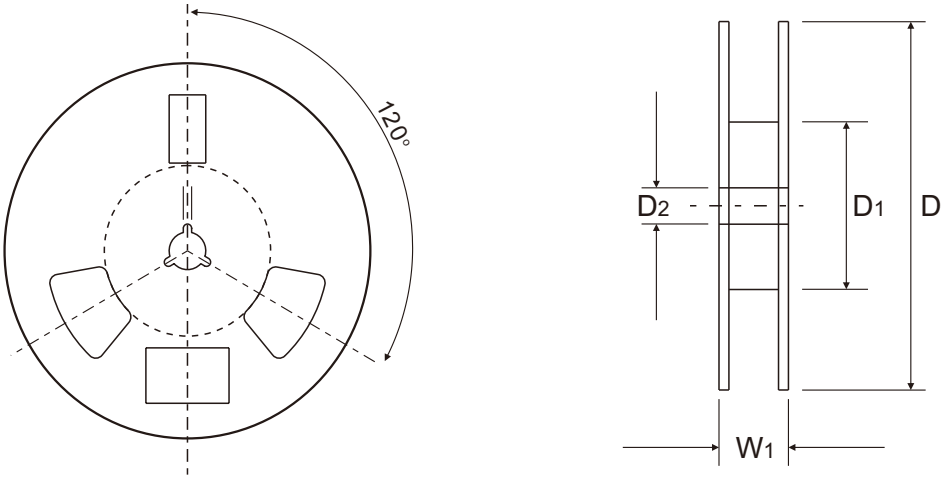


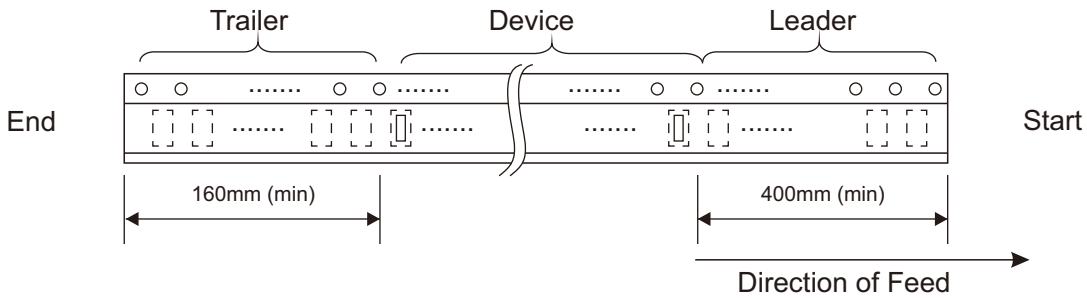
Fig.14 - Maximum Drain Current vs Case Temperature



Reel Taping Specification





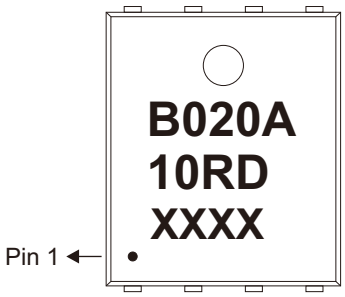


	SYMBOL	A	B	C	d	D	D1	D2
PDFN5x6 -8L	(mm)	6.30 ± 0.10	5.30 ± 0.10	1.20 ± 0.10	1.50 + 0.10 − 0.00	330.00 ± 1.00	100 ± 0.50	13.00 ± 0.20
	(inch)	0.248 ± 0.004	0.209 ± 0.004	0.047 ± 0.004	0.059 + 0.004 − 0.000	12.992 ± 0.039	3.937 ± 0.020	0.512 ± 0.008

	SYMBOL	E	F	P	P0	P1	T	W	W1
PDFN5x6 -8L	(mm)	1.75 ± 0.10	5.50 ± 0.05	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.25 ± 0.05	12.00 ± 0.30	17.60 + 0.10 − 0.00
	(inch)	0.069 ± 0.004	0.217 ± 0.002	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.010 ± 0.002	0.472 ± 0.012	0.693 + 0.004 − 0.000

Marking Code

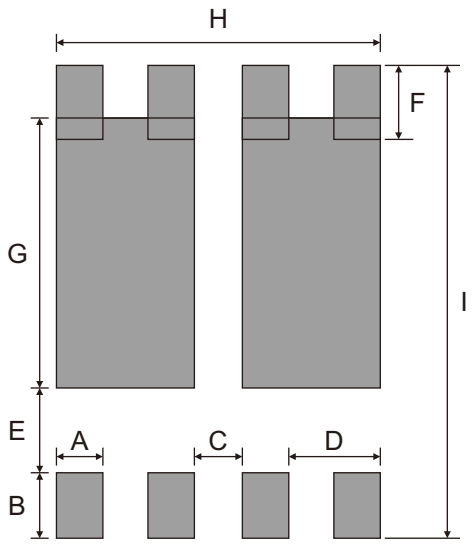
Part Number	Marking Code
CMS20NN10H8-HF	B020A10RD



XXXX = Control code

Suggested P.C.B. PAD Layout

SIZE	PDFN5x6-8L	
	(mm)	(inch)
A	0.61	0.024
B	0.86	0.034
C	0.66	0.026
D	1.27	0.050
E	1.23	0.048
F	1.02	0.040
G	3.81	0.150
H	4.42	0.174
I	6.61	0.260



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
PDFN5x6-8L	3,000	13