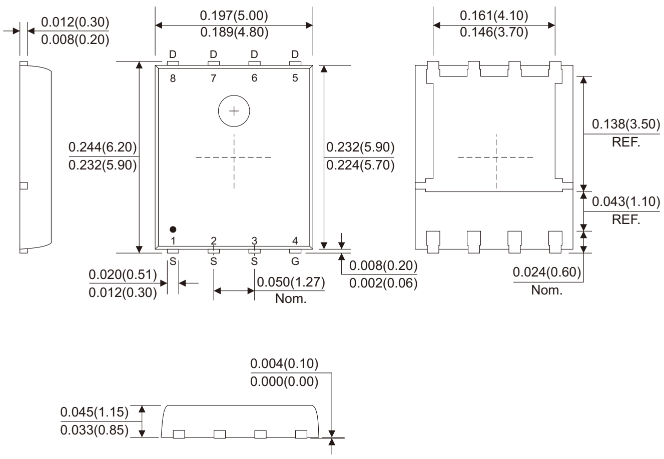
CMS100N04H8-HF

N-Channel
RoHS Device
Halogen Free

PR-PAK



Dimensions in inches and (millimeter)

Features

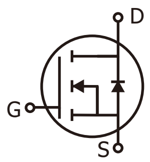
- Advanced DMOS trench technology.
- Fast switching.
- Improve dv/dt capability.
- 100% EAS and Rg guaranteed.
- Green device available.

Mechanical data

- Case: PR-PAK

Circuit Diagram

- G : Gate
- S : Source
- D : Drain



Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
Drain-source voltage		V_{DS}	40	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current (Note 1)	T_C = 25°C	I_D	100	A
	T_C = 100°C	I_D	63	
Pulsed drain current (Note 1, 2)		I_{DM}	400	A
Total power dissipation (Note 4)	T_C = 25°C	P_D	135	W
	T_A = 25°C	P_D	2	
Single pulse avalanche energy, L=0.1mH (Note 3)		E_{AS}	312	mJ
Single pulse avalanche current, L=0.1mH (Note 3)		I_{AS}	79	A
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +150	°C
Thermal resistance junction-ambient (Note 1)	Steady state	$R_{\theta JA}$	62.5	°C/W
Thermal resistance junction-case (Note 1)	Steady state	$R_{\theta JC}$	0.92	°C/W

Notes: 1. The data tested by surface mounted on a 1inch² FR-4 board with 2oz copper.
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.
3. The EAS data shows max. rating. The test condition is VDD=25V, VGS=10V, L=0.1mH, IAS=79A.
4. The power dissipation is limited by 150°C junction temperature.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	40			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.2	1.6	2.5	V
Gate-source leakage current	I_{GSS}	V_{GS} = ±20V			±100	nA
Drain-source leakage current (Tj=25°C)	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V			1	μA
Drain-source leakage current (Tj=125°C)		V_{DS} = 32V, V_{GS} = 0V			10	
Static drain-source on-resistance (Note 2)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 25A		2.2	2.8	mΩ
		V_{GS} = 4.5V, I_D = 12A		2.6	3.5	
Total gate charge (Note 2)	Q_g	I_D = 10A, V_{DS} = 20V, V_{GS} = 4.5V		44.4		nC
Gate-source charge	Q_{gs}			9.6		
Gate-drain ("miller") charge	Q_{gd}			16		
Turn-on delay time (Note 2)	$t_{d(on)}$	V_{DD} = 20V, I_D = 1A V_{GS} = 10V, R_G = 6Ω		28		nS
Rise time	t_r			3.2		
Turn-off delay time	$t_{d(off)}$			89		
Fall time	t_f			14		
Input capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		4940		pF
Output capacitance	C_{oss}			425		
Reverse transfer capacitance	C_{rss}			170		
Gate resistance	R_g	f = 1MHz		1.4		Ω
Source-drain diode						
Diode forward voltage (Note 2)	V_{SD}	I_S = 20A, V_{GS} = 0V, T_J = 25°C			1.2	V
Continuous source current (Note 1, 4)	I_S	V_G = V_D = 0V, Force current			100	A
Pulsed source current (Note 2, 4)	I_{SM}				200	A
Guaranteed avalanche characteristics						
Single pulse avalanche energy (Note 3)	EAS	V_{DD} = 25V, L = 0.1mH, I_{AS} = 40A	80			mJ

Notes: 1. The data tested by surface mounted on a 1inch² FR-4 board with 2oz copper.
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.
3. The min. value is 100% EAS tested guarantee.
4. The data is theoretically the same as ID and IDM, in real applications, should be limited by total power dissipation.

Rating and Characteristic Curves (CMS100N04H8-HF)

Fig.1 - Typical Output Characteristics

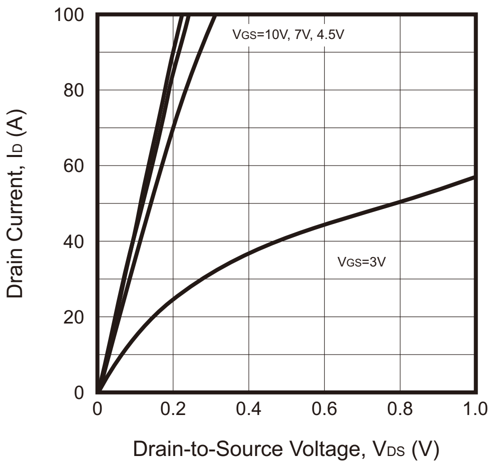


Fig.2 - On-Resistance vs. G-S Voltage

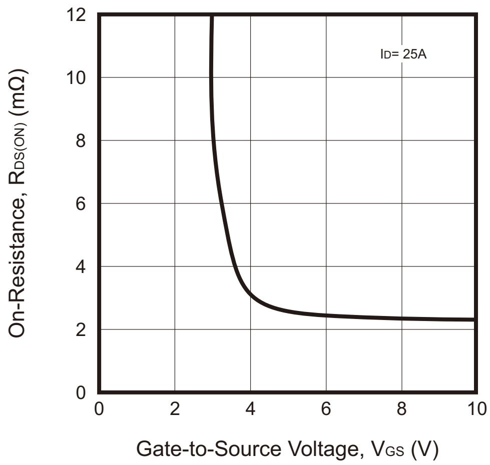


Fig.3 - On-Resistance vs. Drain Current

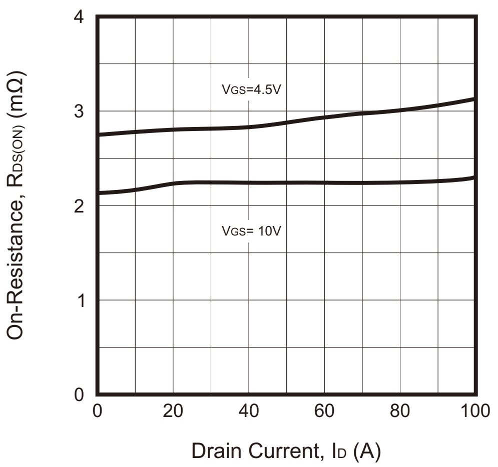


Fig.4 - Normalized $R_{DS(ON)}$ vs. T_J

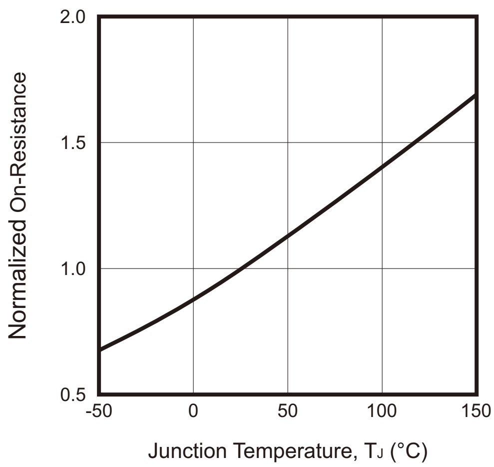


Fig.5 - Normalized $V_{GS(th)}$ vs. T_J

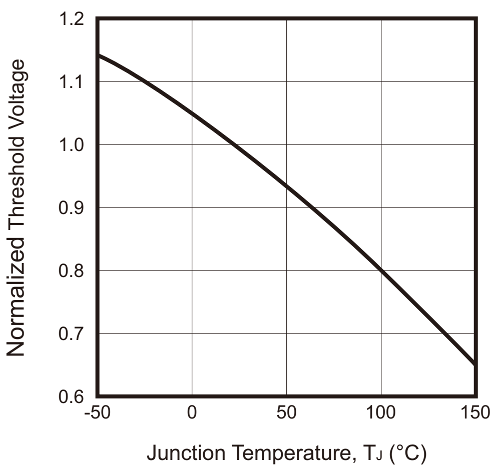
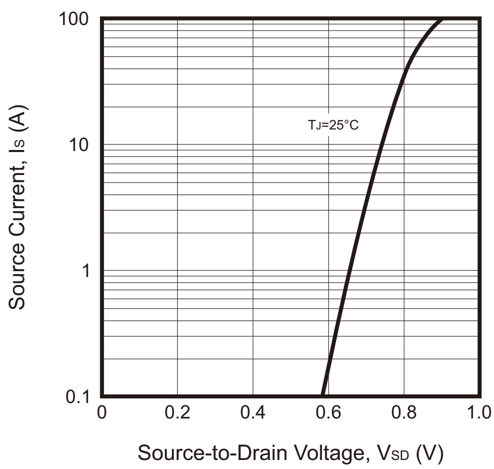


Fig.6 - Forward Characteristics of Reverse



Rating and Characteristic Curves (CMS100N04H8-HF)

Fig.7 - Gate Charge Characteristics

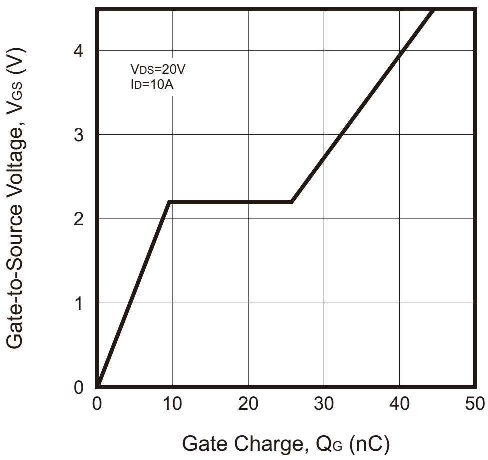


Fig.8 - Drain Current vs. Tc

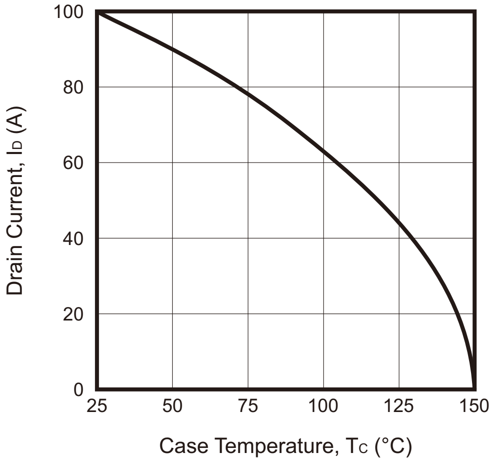
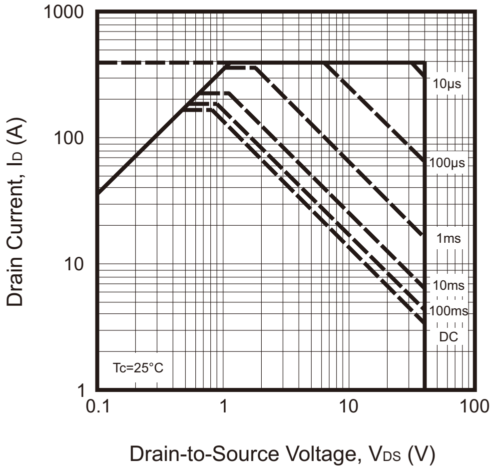
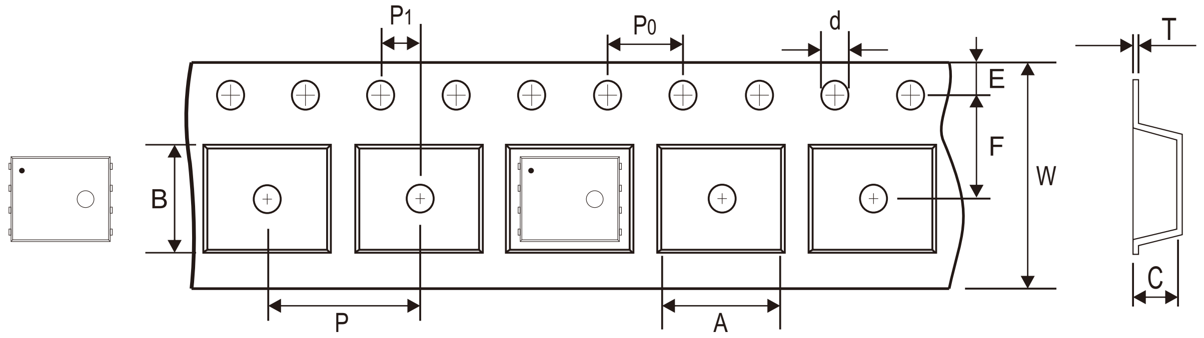
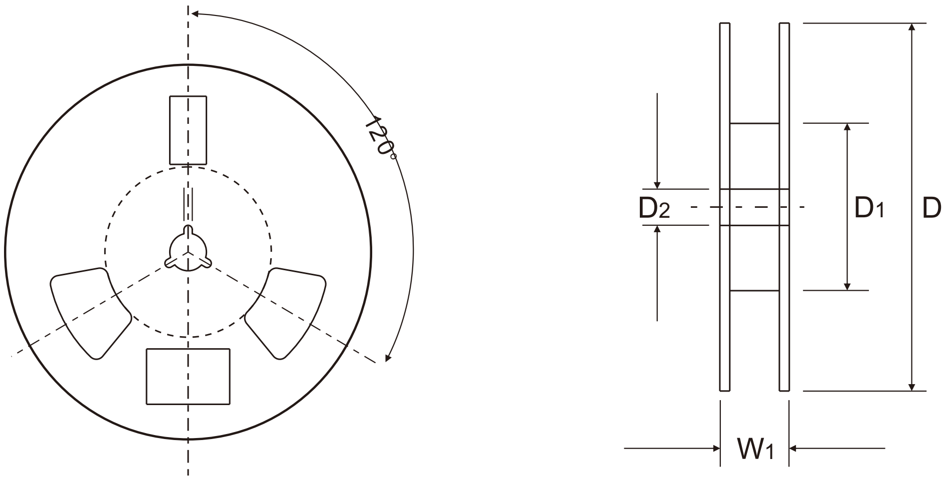


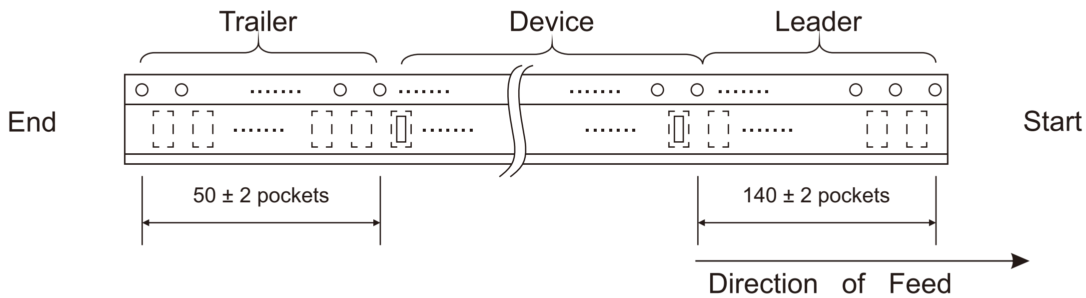
Fig.9 - Safe Operating Area



Reel Taping Specification





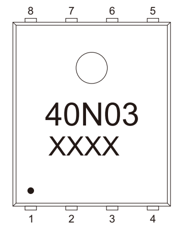


	SYMBOL	A	B	C	d	D	D1	D2
PR-PAK	(mm)	6.50 ± 0.10	5.30 ± 0.10	1.40 ± 0.10	1.50 + 0.10 - 0.00	330.00 ± 1.00	178.00 + 0.00 - 2.00	13.00 min.
	(inch)	0.256 ± 0.004	0.209 ± 0.004	0.055 ± 0.004	0.059 + 0.004 - 0.000	12.992 ± 0.039	7.008 + 0.000 - 0.079	0.512 min.

	SYMBOL	E	F	P	P0	P1	T	W	W1
PR-PAK	(mm)	1.75 ± 0.10	5.50 ± 0.05	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.30 ± 0.05	12.00 ± 0.30	18.40 ref.
	(inch)	0.069 ± 0.004	0.217 ± 0.002	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.012 ± 0.002	0.472 ± 0.012	0.724 ref.

Marking Code

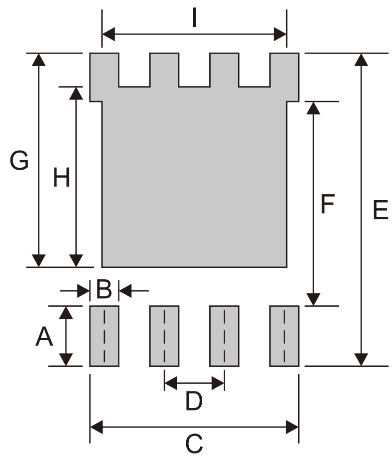
Part Number	Marking Code
CMS100N04H8-HF	40N03



XXXX = Control code

Suggested PAD Layout

SIZE	PR-PAK	
	(mm)	(inch)
A	1.27	0.050
B	0.61	0.024
C	4.42	0.174
D	1.27	0.050
E	6.61	0.260
F	4.32	0.170
G	4.52	0.178
H	3.81	0.150
I	3.91	0.154



Note: 1. The pad layout is for reference purposes only.

Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
PR-PAK	3,000	13