CMS40N03V8-HF

N-Channel
RoHS Device
Halogen Free

Features

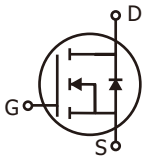
- Low on-resistance.
- Low miller charge.
- Low input capacitance.
- Green device available.
- 100% EAS and 100% Rg guaranteed.

Mechanical data

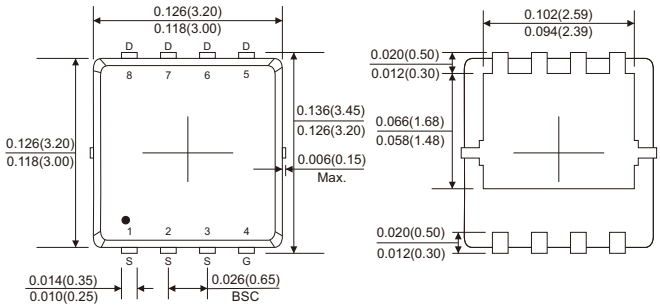
- Case: PDFN3.3x3.3/SPR-PAK standard package, molded plastic.

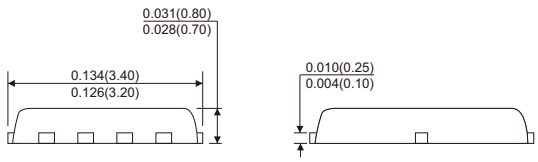
Circuit diagram

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



PDFN3.3x3.3(SPR-PAK)





Dimensions in inches and (millimeter)

Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
Drain-source voltage		V_{DS}	30	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current	I_D @ T_A = 25°C		25	A
	I_D @ T_A = 70°C		20	
Pulsed drain current (Note 1)		I_{DM}	100	A
Continuous drain current (Note 3)	I_D @ T_C = 25°C		40	A
	I_D @ T_C = 70°C		40	
Total power dissipation	P_D @ T_C = 25°C		52	W
	P_D @ T_A = 25°C		3.8	
Single pulse avalanche energy, L=0.1mH		E_{AS}	72	mJ
Single pulse avalanche current, L=0.1mH		I_{AS}	38	A
Operating junction temperature range		T_J	-55 to +150	°C
Storage temperature range		T_{STG}	-55 to +150	°C
Thermal resistance junction-ambient (Note 2)	t ≤ 10s	$R_{\theta JA}$	33	°C/W
Thermal resistance junction-case (Note 2)	Steady state	$R_{\theta JC}$	2.4	°C/W

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	30			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.15		2.2	
Forward transconductance (Note 1)	g_{fs}	V_{DS} = 15V, I_D = 19A		82		S
Gate-source leakage current	I_{GSS}	V_{GS} = ±20V			±100	nA
Drain-source leakage current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V			1	μA
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 19A		3.4	4.8	mΩ
		V_{GS} = 4.5V, I_D = 16A		4.7	5.8	
Total gate charge	Q_g	I_D = 19A, V_{DS} = 15V, V_{GS} = 4.5V		12		nC
Gate-source charge	Q_{gs}			6		
Gate-drain ("miller") charge	Q_{gd}			5		
Turn-on delay time	$t_{d(on)}$	V_{DS} = 15V, V_{GS} = 4.5V I_D = 10A, R_G = 1Ω, R_L = 1.5Ω		24		nS
Rise time	t_r			21		
Turn-off delay time	$t_{d(off)}$			25		
Fall time	t_f			17		
Input capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		1750		pF
Output capacitance	C_{oss}			360		
Reverse transfer capacitance	C_{rss}			150		
Gate resistance	R_g	f = 1MHz		3.2		Ω
Source-drain diode						
Max. body-diode continuous current	I_S				40	A
Diode forward voltage	V_{SD}	I_S = 10A, V_{GS} = 0V		0.8	1.2	V
Reverse recovery time	t_{rr}	I_F = 10A , T_J=25°C dI/dt = 100A/μs		25		nS
Reverse recovery charge	Q_{rr}			17		nC
Guaranteed avalanche characteristics						
Single pulse avalanche energy (Note 4)	EAS	V_{DD} = 20V, L=0.1mH, I_{AS} = 31A	48			mJ

Notes: 1. The data tested by pulsed, pulse width ≤300μs, duty cycle ≤ 2%.

2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by desgn while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.

3. The maximum current rating is limited by package.

4. The min. value is 100% EAS tested guarantee.

Rating and Characteristic Curves (CMS40N03V8-HF)

Fig.1 - Typical Output Characteristics

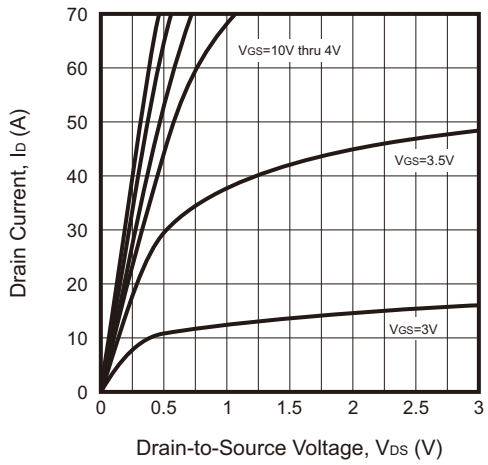


Fig.2 - On-Resistance vs. G-S Voltage

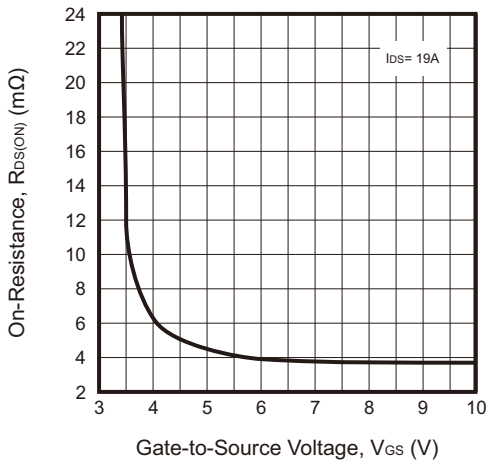


Fig.3 - On-Resistance vs. Drain Current

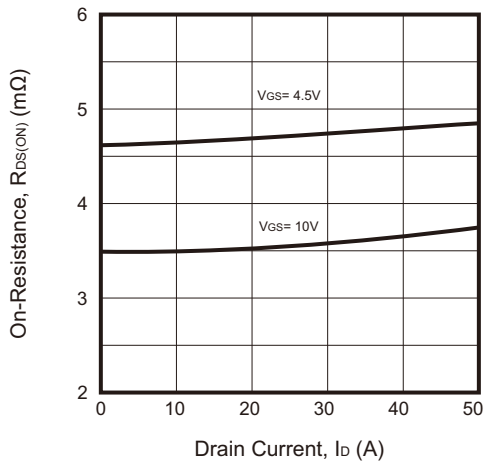


Fig.4 - Normalized $R_{DS(ON)}$ vs. T_J

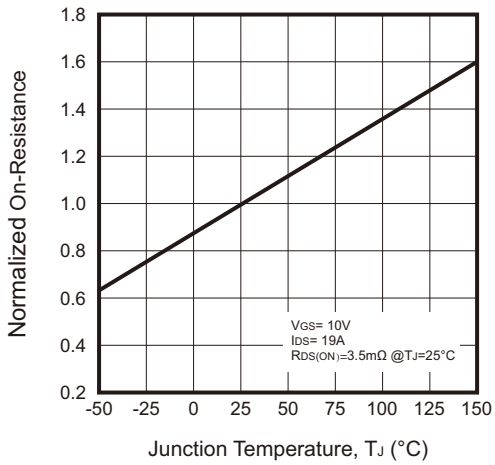


Fig.5 - Normalized $V_{GS(th)}$ vs. T_J

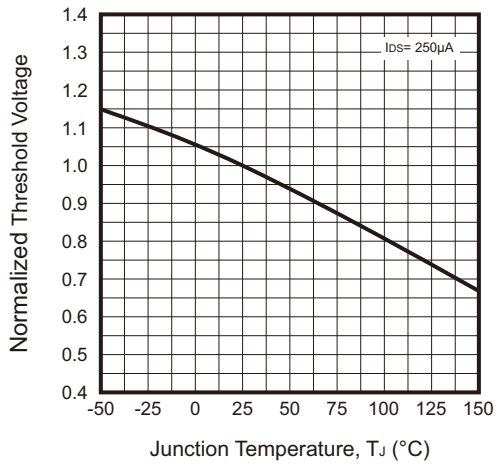
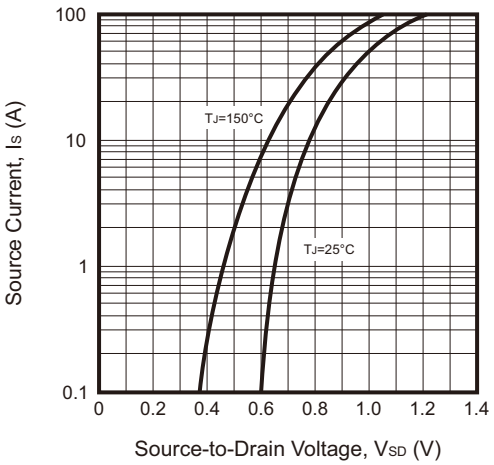


Fig.6 - Forward Characteristics of Reverse



Company reserves the right to improve product design , functions and reliability without notice.

Rating and Characteristic Curves (CMS40N03V8-HF)

Fig.7 - Gate Charge Characteristics

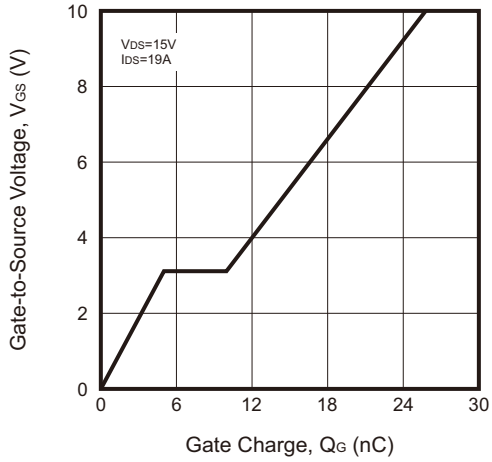


Fig.8 - Capacitance Characteristics

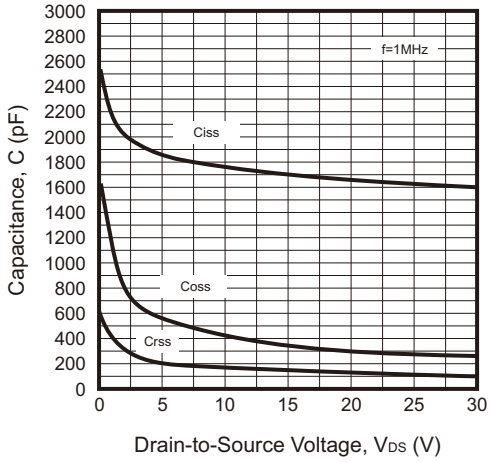


Fig.9 - Safe Operating Area

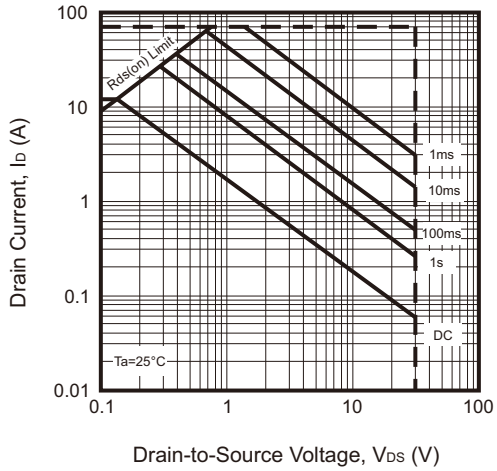


Fig.10 - Power Dissipation

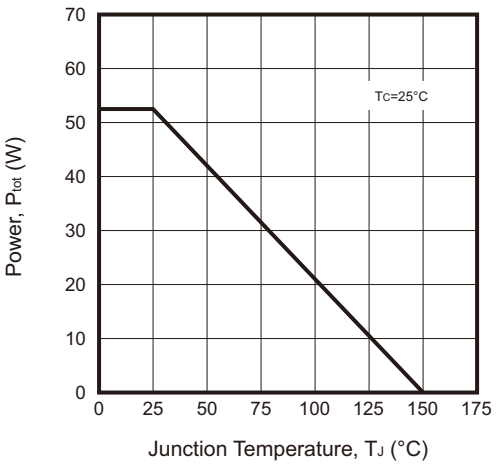
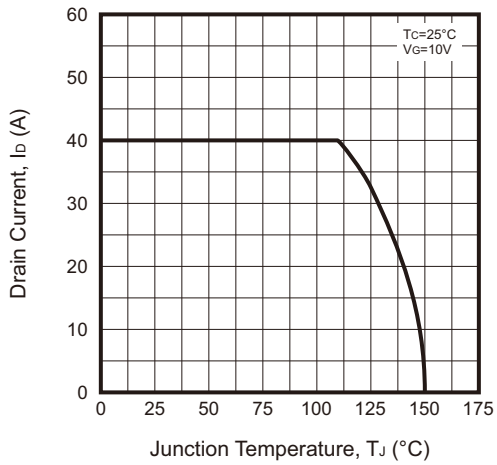
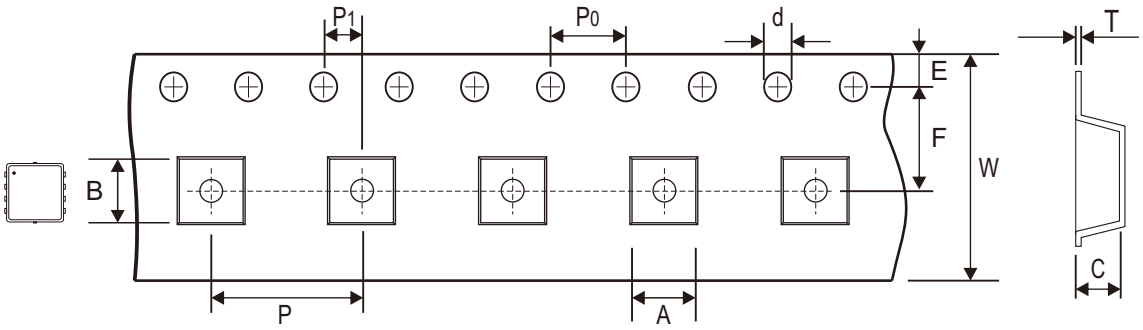
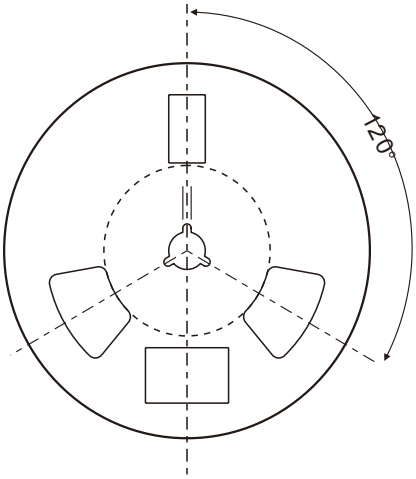


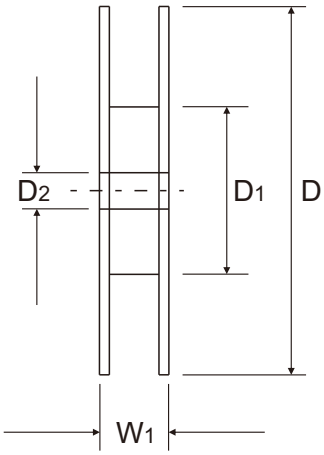
Fig.11 - Drain Current vs. TJ

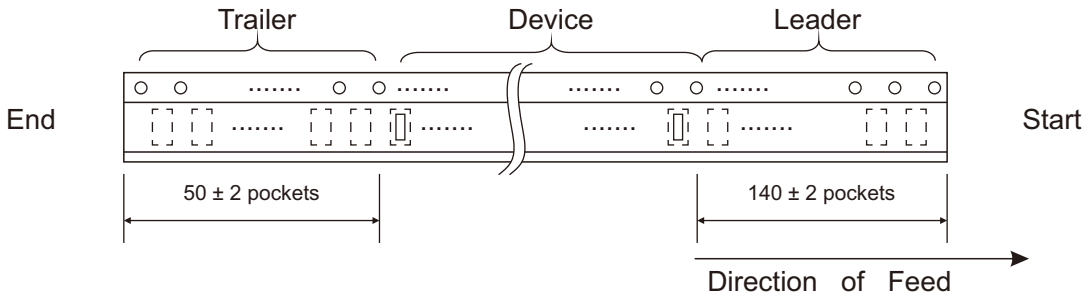


Reel Taping Specification







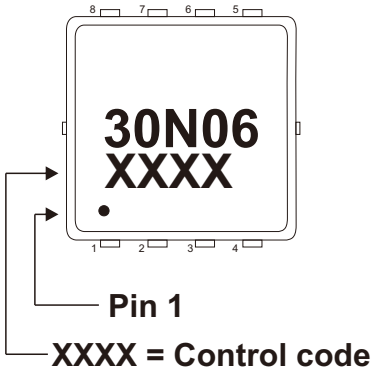


	SYMBOL	A	B	C	d	D	D_1	D_2
SPR-PAK	(mm)	3.55 ± 0.10	3.55 ± 0.10	1.10 + 0.10 - 0.05	1.50 + 0.10 - 0.00	330.00 ± 1.00	178.00 + 0.00 - 2.00	13.00 min.
	(inch)	0.140 ± 0.004	0.140 ± 0.004	0.043 + 0.004 - 0.002	0.059 + 0.004 - 0.000	12.992 ± 0.039	7.008 + 0.000 - 0.079	0.512 min.

	SYMBOL	E	F	P	P_0	P_1	T	W	W_1
SPR-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 - 0.10	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 - 0.004	0.724 ref.

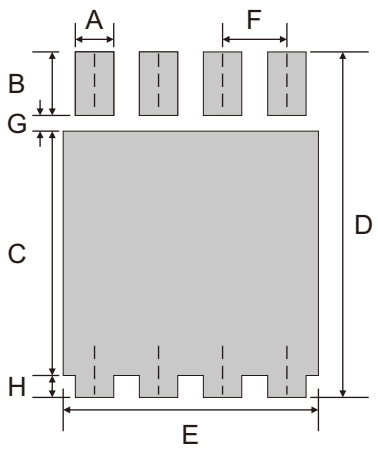
Marking Code

Part Number	Marking Code
CMS40N03V8-HF	30N06



Suggested PAD Layout

SIZE	SPR-PAK (PDFN3.3x3.3)	
	(mm)	(inch)
A	0.40	0.016
B	0.60	0.024
C	2.35	0.093
D	3.55	0.140
E	2.80	0.110
F	0.65	0.026
G	0.35	0.014
H	0.25	0.010



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

Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SPR-PAK (PDFN3.3x3.3)	3000	13