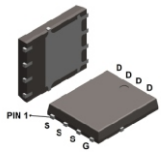
CMS23N06H8-HF

N-Channel
RoHS Device
Halogen Free



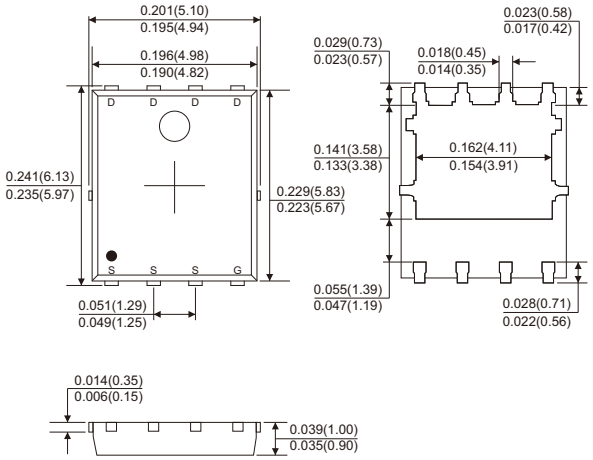
Features

- Ultra-low on-resistance and gate-charge.
- Advanced shielded-gate technology.

Mechanical data

- Case: PDFN5x6-8L, molded plastic.
- Molding compound: UL flammability classification rating 94V-0.
- Terminals: Matte tin-plated leads, solderability-per MIL-STD-202, method 208.

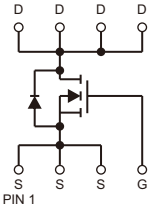
PDFN5x6-8L



Dimensions in inches and (millimeter)

Circuit Diagram

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



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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DSS}	60	V
Gate-source voltage	V_{GSS}	±20	V
Continuous drain current (T_C=25°C, silicon limited) (Note 1)	I_D	125	A
Continuous drain current (T_C=100°C, silicon limited) (Note 1)	I_D	79	
Continuous drain current (T_A=25°C, silicon limited) (Note 2, 3)	I_D	23	
Continuous drain current (T_A=100°C, silicon limited) (Note 2, 3)	I_D	14	
Pulsed drain current (tp=1ms) (Note 4)	I_{DM}	370	A
Single pulse avalanche energy (Note 5)	E_{AS}	110	mJ
Avalanche current (Note 6)	I_{AS}	40	A
Power dissipation (T_C=25°C)	P_D	86	W
Thermal resistance junction to case	$R_{\theta JC}$	1.45	°C/W
Thermal resistance junction to air (Note 3)	$R_{\theta JA}$	45	°C/W
Operating junction temperature range	T_J	-55 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Notes: 1. Rated according to $R_{\theta JC}$.
2. Rated according to $R_{\theta JA}$.
3. Surgace-mounted on 1 inch² FR4 board, 2oz Cu.
4. Limited by maximum T_J.
5. Starting T_J=25°C, V_{DD}=30V, V_{GS}=10V, L=0.1mH.
6. Pulse width limited by maximum T_J.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V_{DSS}	V_{GS} = 0V, I_D = 250μA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics						
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		2.6	3.1	mΩ
		V_{GS} = 4.5V, I_D = 20A		3.5	4.4	
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.8	2.5	V
Forward transconductance	gfs	V_{DS} = 5V, I_D = 30A		92		S
Gate resistance	Rg	f = 1MHz		1		Ω
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3467		pF
Output capacitance	C_{oss}			1400		
Reverse transfer capacitance	C_{rss}			50		
Total gate charge	Q_g	V_{DD} = 30V, V_{GS} = 10V, I_D = 30A		64		nC
Gate to source charge	Q_{gs}			8		
Gate to drain (miller) charge	Q_{gd}			12		
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD} = 30V, V_{GS} = 10V, R_G = 3Ω, I_D = 15A		23		ns
Turn-on rise time	t_r			62		
Turn-off delay time	$t_{d(off)}$			105		
Turn-off fall time	t_f			28		
Source-Drain Diode Characteristics						
Diode forward voltage	V_{SD}	I_S = 30A, V_{GS} = 0V		0.8		V
Reverse recovery time	t_{rr}	I_S = 30A, V_{GS} = 0V, di/dt = 100A/μs T_b = 25%		55		ns
Reverse recovery charge	Q_{rr}			80		nC

Rating and Characteristic Curves (CMS23N06H8-HF)

Fig.1 - Output Characteristics

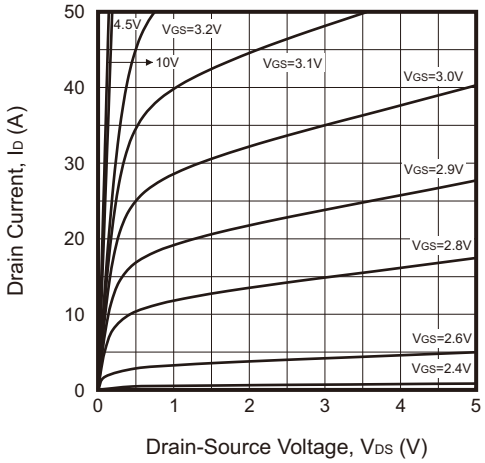


Fig.2 - On-Resistance vs. Drain Current

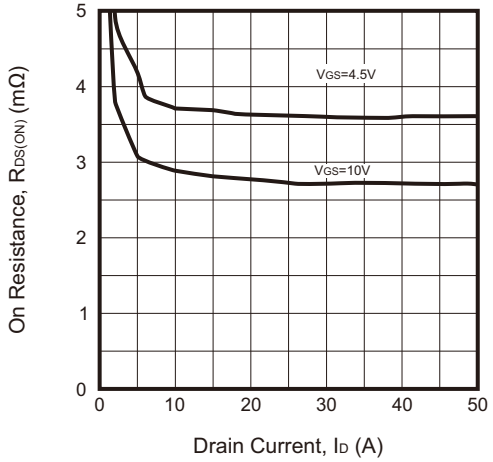


Fig.3 - On-Resistance vs. Gate-Source Voltage

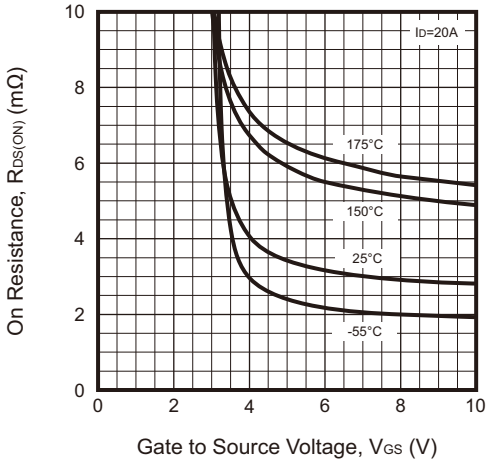


Fig.4 - Body-Diode Characteristics

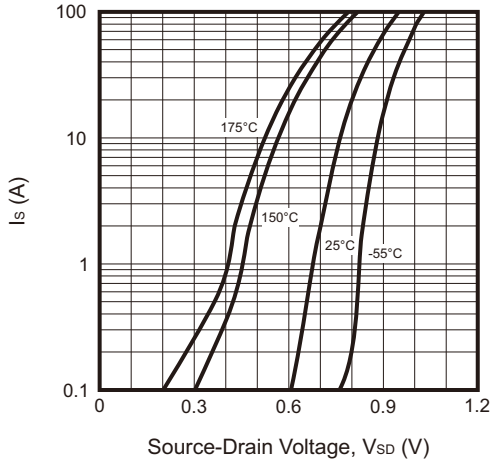


Fig.5 - Capacitance Characteristics

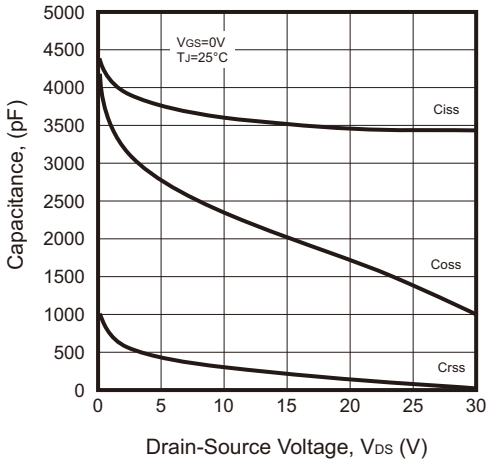
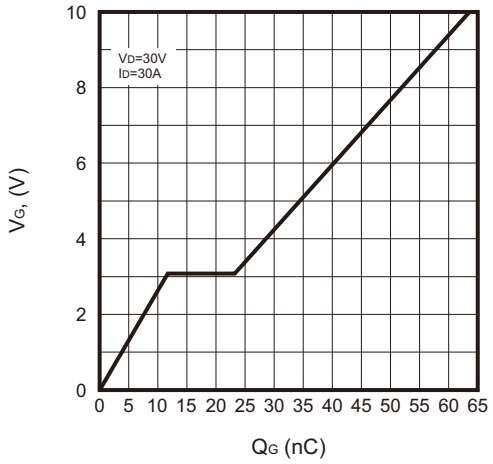


Fig.6 - Gate-Change Characteristics



Rating and Characteristic Curves (CMS23N06H8-HF)

Fig.7 - Transfer Characteristics

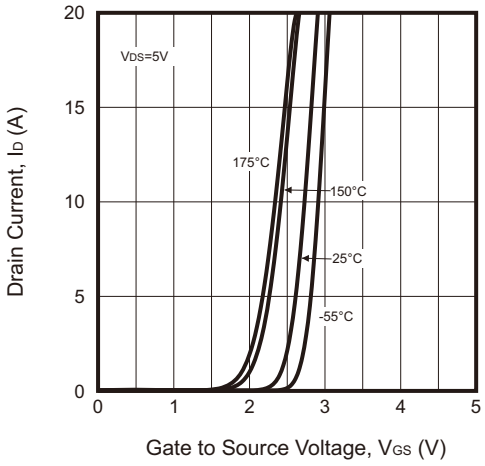


Fig.8 - Normalized $R_{DS(ON)}$ vs T_J

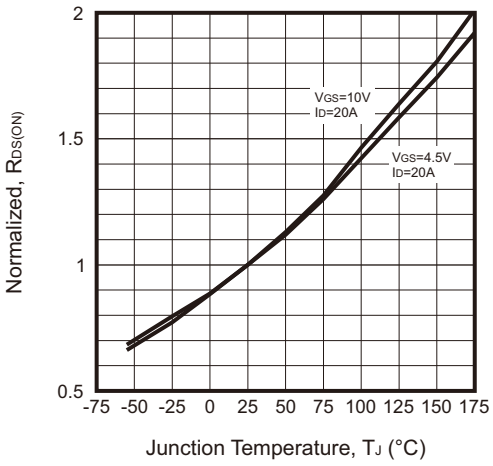


Fig.9 - Normalized $V_{GS(th)}$ vs T_J

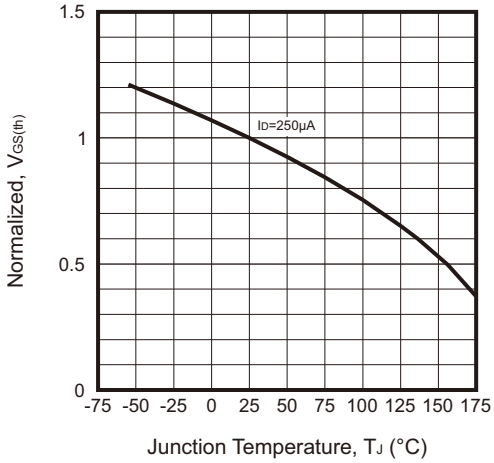


Fig.10 - BV_{DSS} vs T_J

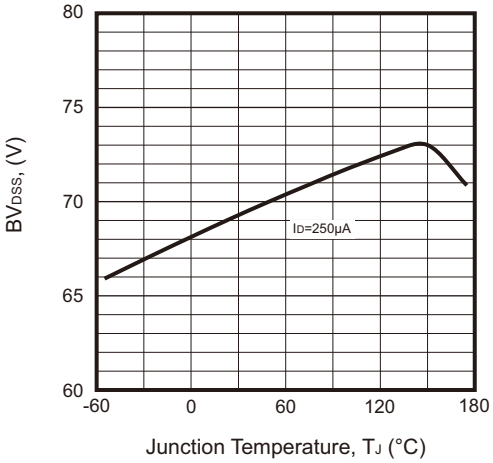
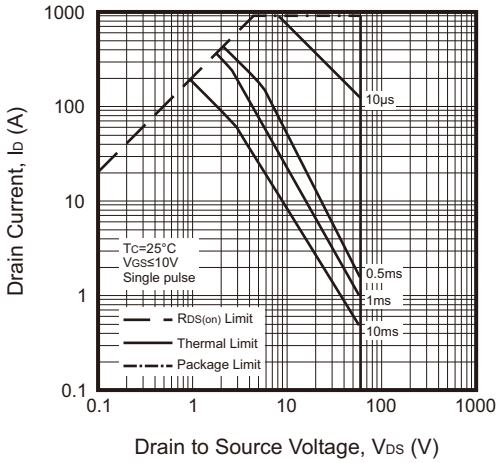
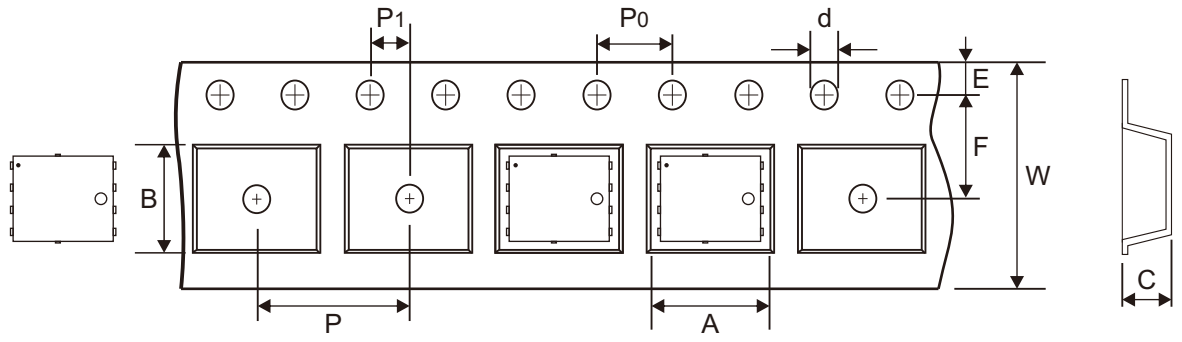
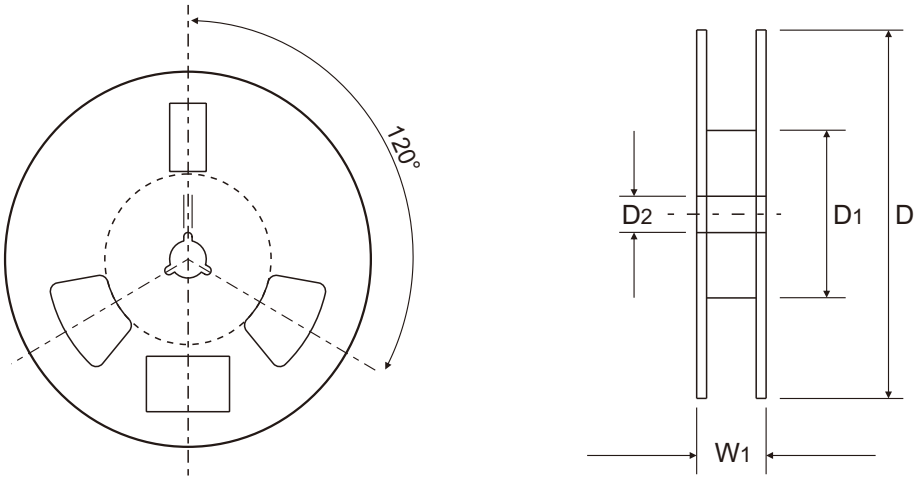


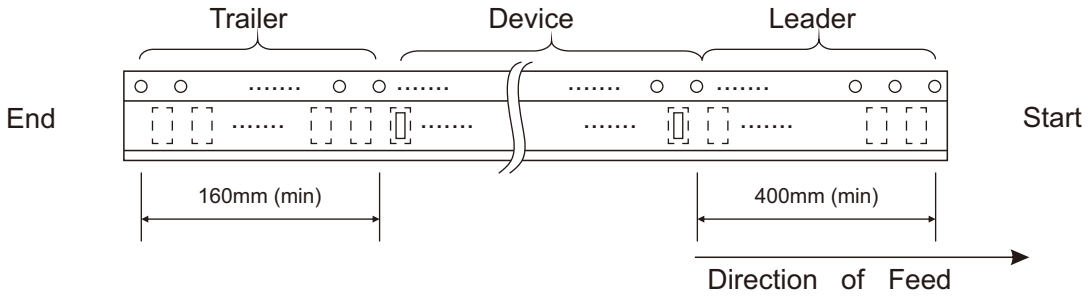
Fig.11 - Maximum Safe Operating Area



Reel Taping Specification





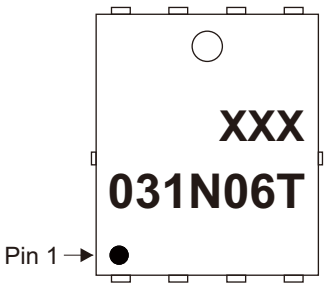


	SYMBOL	A	B	C	d	D	D_1	D_2
PDFN5x6 -8L	(mm)	6.30 ± 0.10	5.30 ± 0.10	1.20 ± 0.10	1.55 + 0.01	330 ± 1.00	100 ± 1.00	13.00 ± 0.20
	(inch)	0.248 ± 0.004	0.209 ± 0.004	0.047 ± 0.004	0.061 + 0.0004	12.992 ± 0.039	3.937 ± 0.039	0.512 ± 0.008

	SYMBOL	E	F	P	P_0	P_1	W	W_1
PDFN5x6 -8L	(mm)	1.75 ± 0.10	5.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	12.00 + 0.30 − 0.10	17.80 ± 0.30
	(inch)	0.069 ± 0.004	0.217 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.472 + 0.012 − 0.004	0.701 ± 0.012

Marking Code

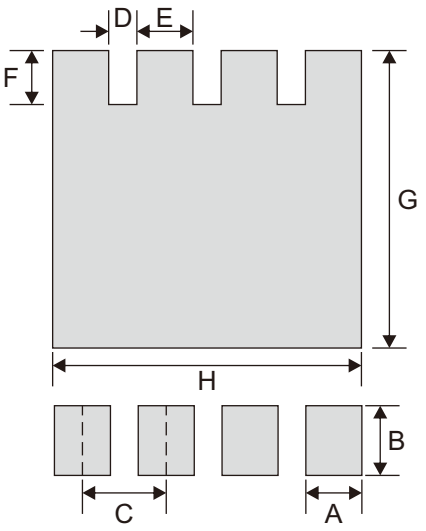
Part Number	Marking Code
CMS23N06H8-HF	031N06T



XXX = Control code

Suggested P.C.B. PAD Layout

SIZE	PDFN5x6-8L	
	(mm)	(inch)
A	0.80	0.031
B	1.00	0.039
C	1.27	0.050
D	0.47	0.019
E	0.80	0.031
F	0.85	0.033
G	4.50	0.177
H	4.60	0.181



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
PDFN5x6-8L	5,000	13