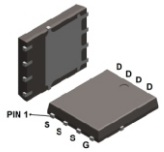
CMS136N10H8-HF

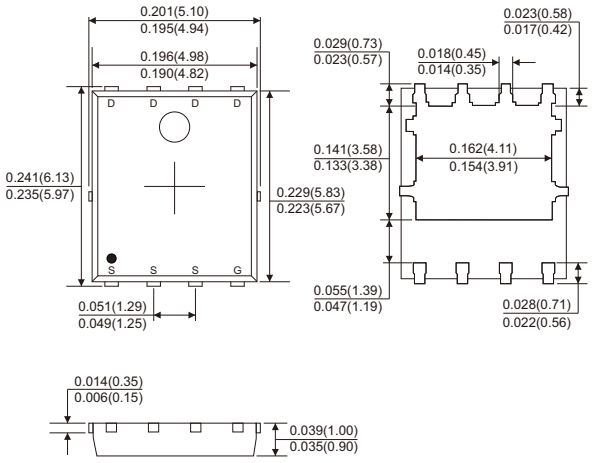
N-Channel
RoHS Device
Halogen Free



Features

- Super low gate charge.
- Green device available.
- Excellent Cdv/dt effect decline.
- Advanced high cell density trench technolgy.

PDFN5x6-8L



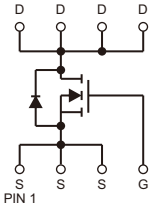
Dimensions in inches and (millimeter)

Mechanical data

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

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_{DS}	100	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current (Tc=25°C, silicon limited)	I_D	136	A
Continuous drain current (Tc=100°C, silicon limited)	I_D	96	
Pulsed drain current (tp=10μs)	I_{DM}	600	A
Single pulse avalanche energy (Note 3)	E_{AS}	210	mJ
Power dissipation (T_C=25°C)	P_D	167	W
Thermal resistance junction to air (Note 1)	$R_{\theta JA}$	50	°C/W
Thermal resistance junction to case	$R_{\theta JC}$	0.9	°C/W
Operating junction temperature range	T_J	-55 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°C

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V, Tc = 25°C			1	μA
	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V, Tc = 55°C			5	
Gate-body leakage current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics						
Static drain-source on-resistance (Note 2)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A			4.5	mΩ
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2		4	V
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz		3980		pF
Output capacitance	C_{oss}			1550		
Reverse transfer capacitance	C_{rss}			68		
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD} = 50V, V_{GS} = 10V, R_G = 3Ω, I_D = 50A		14.3		ns
Turn-on rise time	t_r			20.8		
Turn-off delay time	$t_{d(off)}$			57.7		
Turn-off fall time	t_f			31.89		
Total gate charge	Q_g	V_{DD} = 50V, V_{GS} = 10V, I_D = 50A		72		nC
Gate to source charge	Q_{gs}			14		
Gate to drain (miller) charge	Q_{gd}			22.5		
Source-Drain Diode Characteristics						
Diode forward voltage (Note 2)	V_{SD}	I_{SD} = 1A, V_{GS} = 0V, T_J = 25°C			1.2	V
Diode continuous forward current (Note 1, 4)	I_{SD}				136	A
Reverse recovery time	t_{rr}	I_F = 20A, d_i/d_t = 100A/μs		64		ns
Reverse recovery charge	Q_{rr}			90		nC

Notes: 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

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

3. The E_{AS} data shows Max. rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH.

4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Rating and Characteristic Curves (CMS136N10H8-HF)

Fig.1 - Output Characteristics

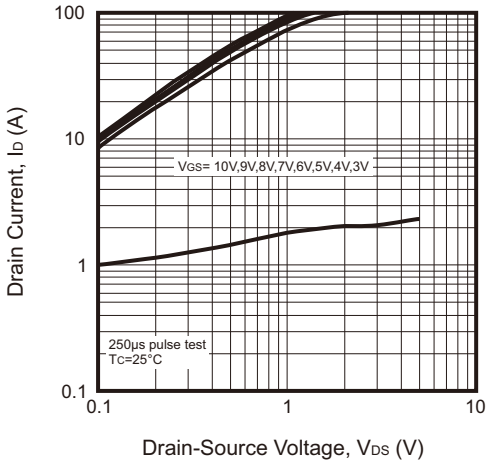


Fig.2 - Transfer Characteristics

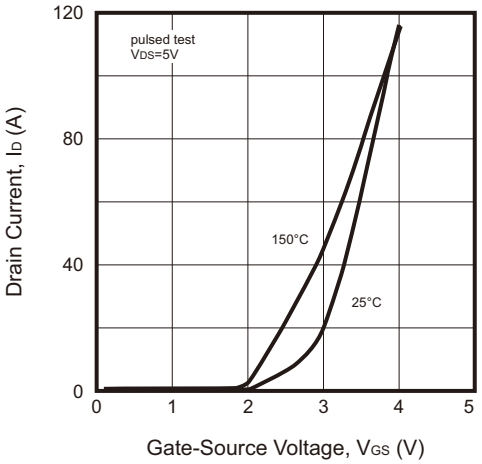


Fig.3 - Drain-Source On-Resistance vs. Drain Current

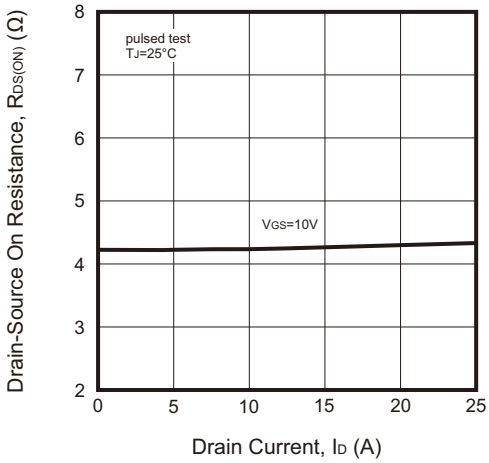


Fig.4 - Body Diode Forward Voltage vs Source Current and Temperature

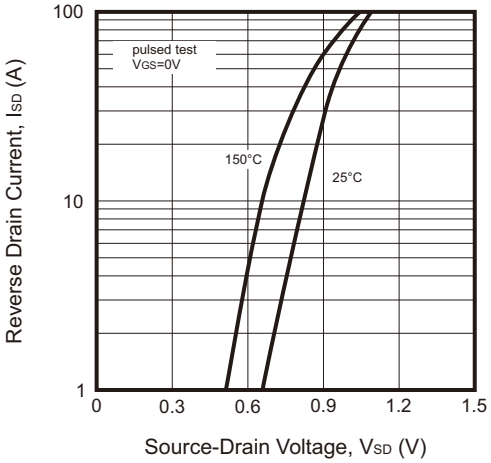


Fig.5 - Capacitance Characteristics

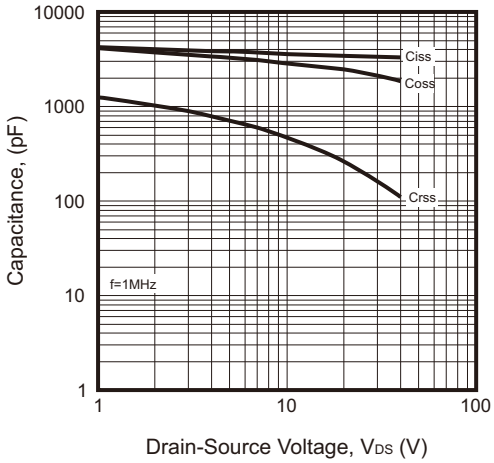
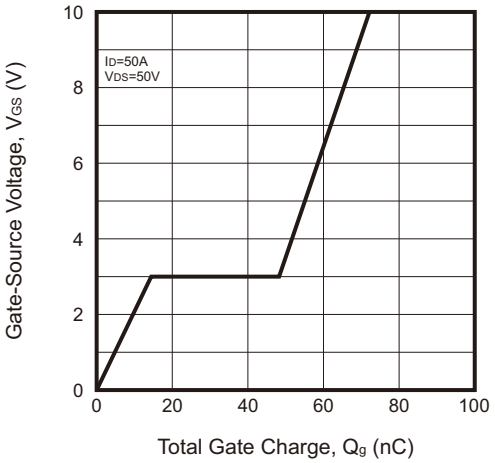


Fig.6 - Forward Transfer Admittance vs Drain Current



Rating and Characteristic Curves (CMS136N10H8-HF)

Fig.7 - Normalized Breakdown Voltage vs Junction Temperature

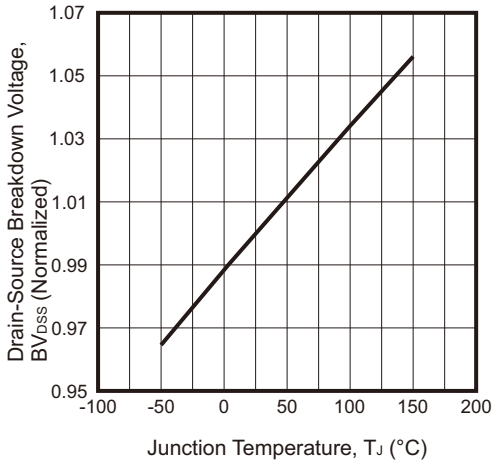


Fig.8 - Normalized On Resistance vs Junction Temperature

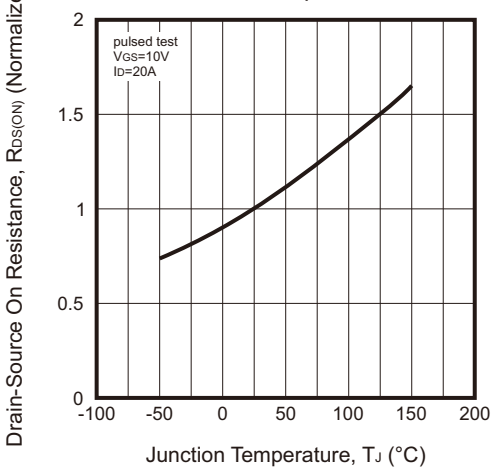


Fig.9 - Maximum Continuous Drain Current vs Case Temperature

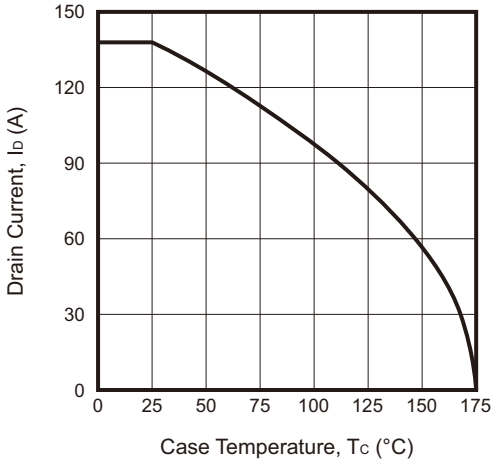


Fig.10 - Maximum Power Dissipation vs Case Temperature

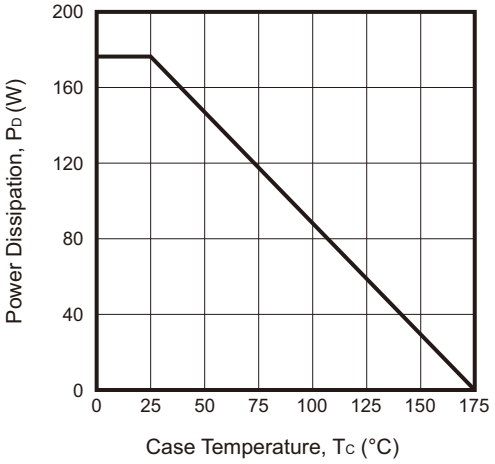


Fig.11 - Drain-Source On Resistance vs Gate Voltage and Drain Current

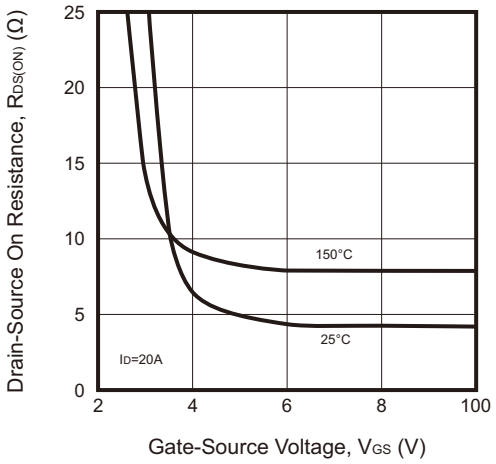
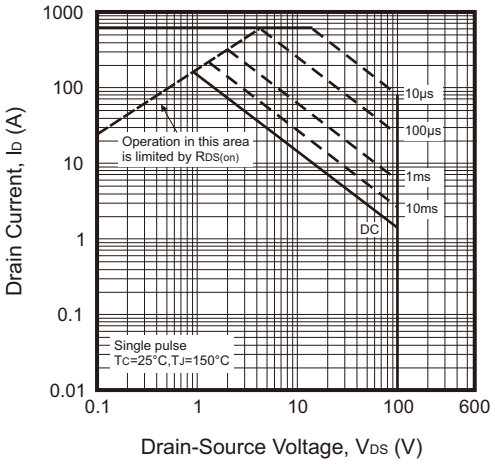
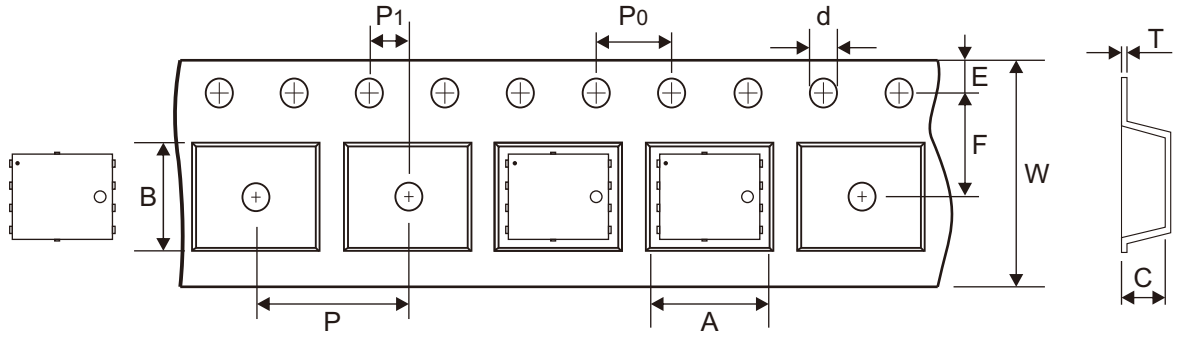
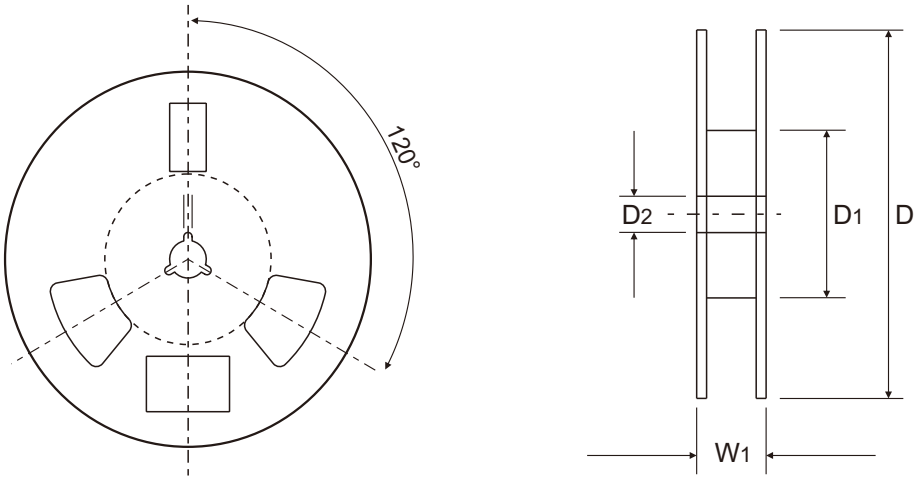


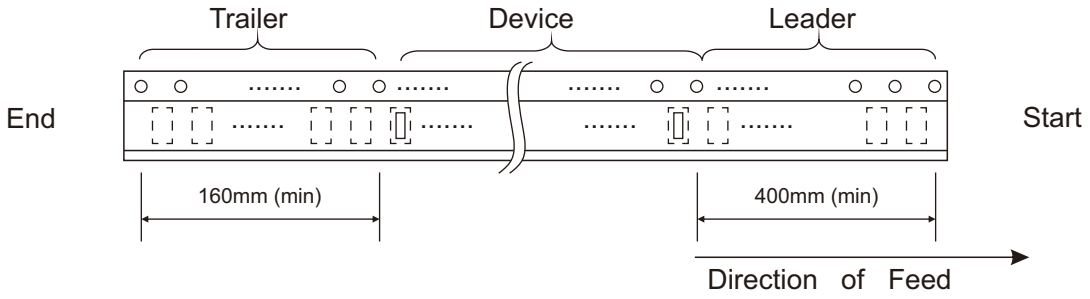
Fig.12 - Maximum Safe Operating Area



Reel Taping Specification





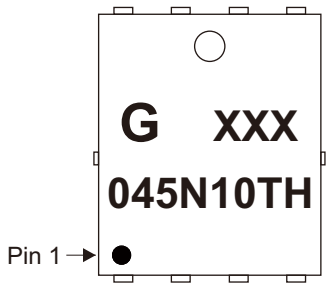


	SYMBOL	A	B	C	d	D	D1	D2
PDFN5x6 -8L	(mm)	6.30 ± 0.10	5.30 ± 0.10	1.20 ± 0.10	1.55 + 0.01	330 ± 2.00	100 ± 2.00	13.00 ± 0.20
	(inch)	0.248 ± 0.004	0.209 ± 0.004	0.047 ± 0.004	0.061 + 0.0004	12.992 ± 0.079	3.937 ± 0.079	0.512 ± 0.008

	SYMBOL	E	F	P	P0	P1	T	W	W1
PDFN5x6 -8L	(mm)	1.75 ± 0.10	5.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.25 ± 0.03	12.00 + 0.30 − 0.10	18.50 ± 2.00
	(inch)	0.069 ± 0.004	0.217 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.010 ± 0.001	0.472 + 0.012 − 0.004	0.728 ± 0.079

Marking Code

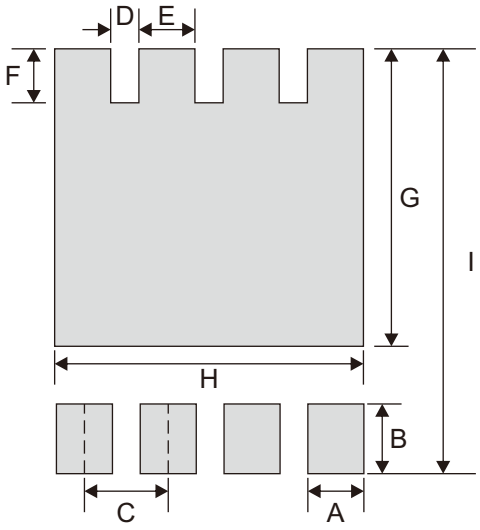
Part Number	Marking Code
CMS136N10H8-HF	045N10TH



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	4.61	0.181
I	6.40	0.252



Standard Packaging

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