

# CMS16P06H8-HF

## Description

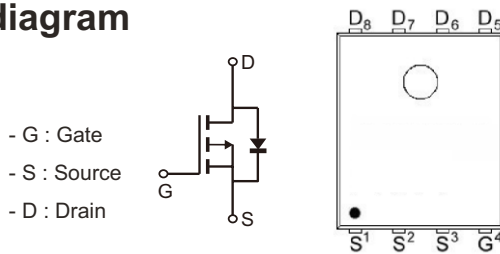
The CMS16P06H8-HF is the highest performance P-ch MOSFETs with super high dense cell design for extremely low  $R_{DS(ON)}$  and gate charge for most of the synchronous buck converter applications.

The CMS16P06H8-HF meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

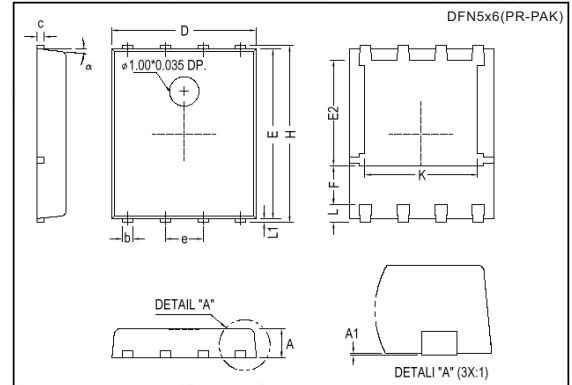
## Features

- Low Reverse Transfer Capacitance
- Improve dv/dt Capability
- Green Device Available
- High Switching Speed
- 100% EAS Guaranteed

## Circuit diagram



## Package Dimensions



REF.	Millimeter			REF.	Millimeter		
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	0.85	1.00	1.15	E	5.70	-	5.90
A1	0.00	-	0.10	e	-	1.27	-
b	0.30	-	0.51	H	5.90	-	6.20
c	0.20	-	0.30	L	-	0.60	-
D	4.80	-	5.00	L1	0.06	-	0.20
F	1.10REF.			$\alpha$	0°	-	12°
E2	3.50REF.			K	3.70	3.90	4.10

## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D @ T_C=25^\circ C$	-16	A
	$I_D @ T_C=100^\circ C$	-10	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-64	A
Continuous Drain Current <sup>1</sup>	$I_D @ T_A=25^\circ C$	-5	A
	$I_D @ T_A=70^\circ C$	-4	A
Total Power Dissipation <sup>4</sup>	$P_D @ T_C=25^\circ C$	25	W
	$P_D @ T_A=25^\circ C$	2	W
Single Pulse Avalanche Energy, $L=0.1mH^3$	EAS	51	mJ
Single Pulse Avalanche Current, $L=0.1mH^3$	IAS	-32	A
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 ~ +150	°C

## Thermal Data

Parameter	Symbol	Conditions	Max. Value	Unit
Thermal Resistance Junction-ambient <sup>1</sup>	$R_{\theta JA}$	Steady State	62.5	°C/W
Thermal Resistance Junction-case <sup>1</sup>	$R_{\theta JC}$	Steady State	5	°C/W

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**Electrical Characteristics** (T<sub>J</sub>=25 °C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-60	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =-250uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.0	-1.7	-2.5	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20V
Drain-Source Leakage Current	I <sub>DSS</sub>	-	-	-1	uA	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	44	48	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-8A
		-	55	65		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	22	-	nC	I <sub>D</sub> =-8A
Gate-Source Charge	Q <sub>gs</sub>	-	4.1	-		V <sub>DS</sub> =-30V
Gate-Drain (“Miller”) Change	Q <sub>gd</sub>	-	5.2	-		V <sub>GS</sub> =-10V
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	13	-	ns	V <sub>DS</sub> =-30V
Rise Time	T <sub>r</sub>	-	42	-		I <sub>D</sub> =-1A
Turn-off Delay Time	T <sub>d(off)</sub>	-	65	-		V <sub>GS</sub> =-10V
Fall Time	T <sub>f</sub>	-	16	-		R <sub>G</sub> =6Ω
Input Capacitance	C <sub>iss</sub>	-	1256	-	pF	V <sub>GS</sub> =0V
Output Capacitance	C <sub>oss</sub>	-	87	-		V <sub>DS</sub> =-30V
Reverse Transfer Capacitance	C <sub>rss</sub>	-	59	-		f=1.0MHz

**Guaranteed Avalanche Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Single Pulse Avalanche Energy <sup>5</sup>	EAS	3.2	-	-	mJ	V <sub>DD</sub> =-25V, L=0.1mH, I <sub>AS</sub> =-8A

**Source-Drain Diode**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	-	-0.72	-1.0	V	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V, T <sub>J</sub> =25 °C
Continuous Source Current <sup>1,6</sup>	I <sub>S</sub>	-	-	-16	A	-----

- Notes :
1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
  2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
  3. The EAS data shows Max. rating. The test condition is V<sub>DD</sub>=-25V, V<sub>GS</sub>=-10V, L=0.1mH, I<sub>AS</sub>=-32A.
  4. The power dissipation is limited by 150 °C junction temperature.
  5. The Min. Value is 100% EAS tested guarantee.
  6. The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

### Typical Characteristics

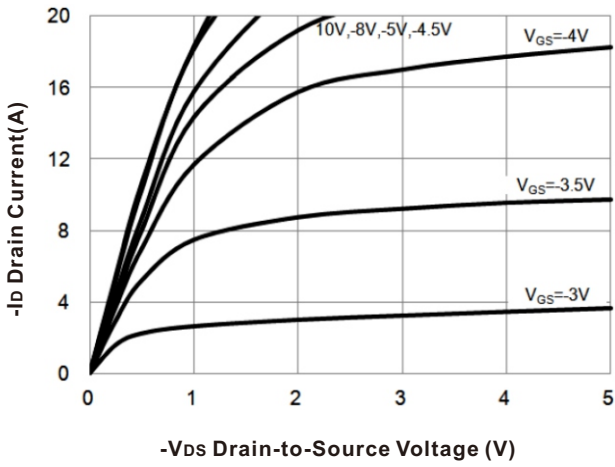


Fig.1 Typical Output Characteristics

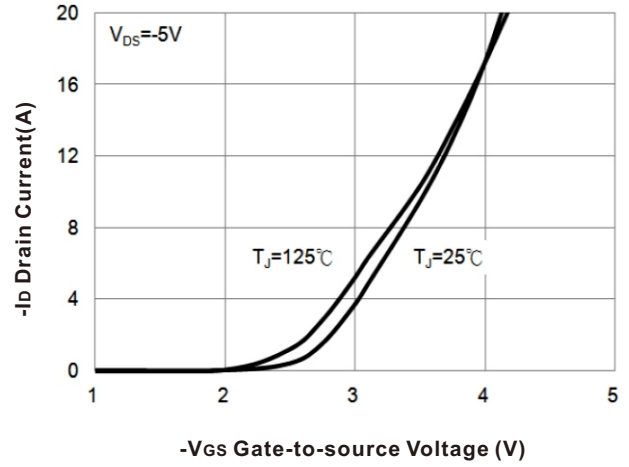


Fig.2 Transfer Characteristics

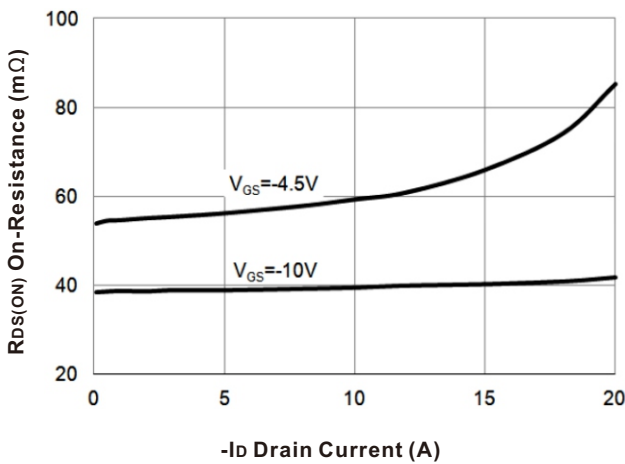


Fig.3 On-Resistance vs. Drain Current

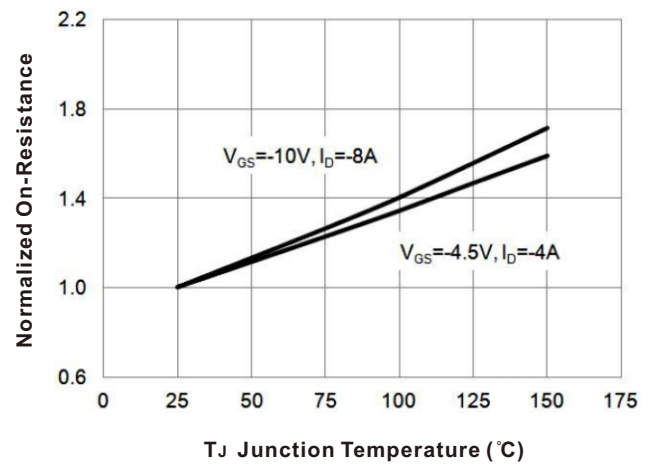


Fig.4 Normalized  $R_{DS(ON)}$  vs.  $T_J$

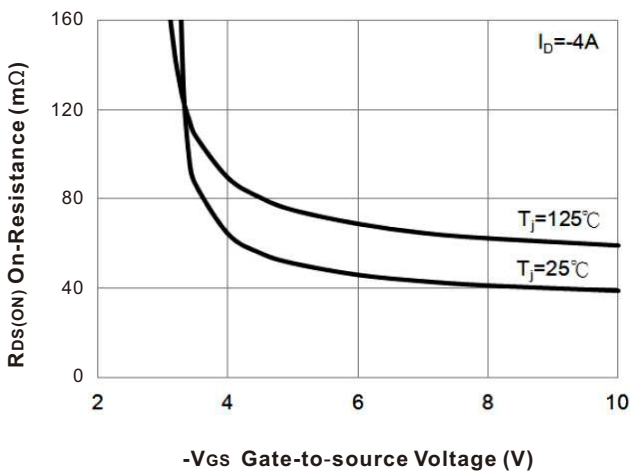


Fig.5 On-Resistance vs. G-S Voltage

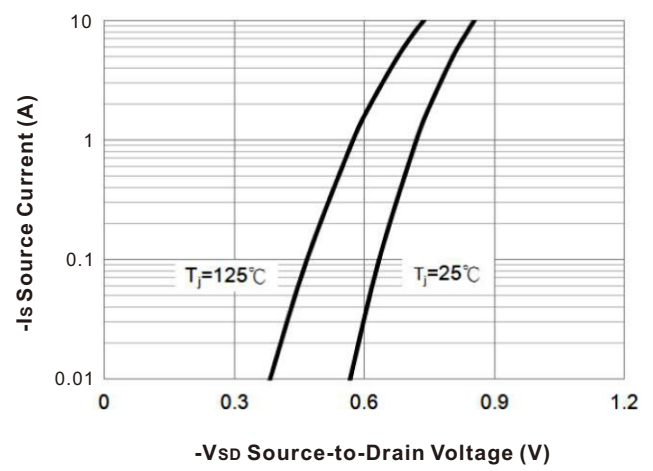


Fig.6 Forward Characteristics of Reverse

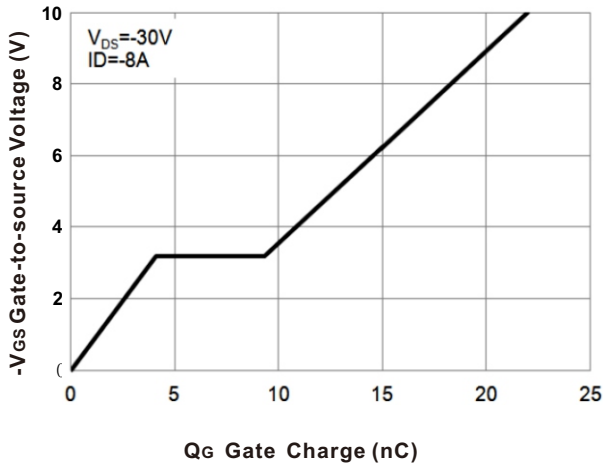


Fig.7 Gate Charge Characteristics

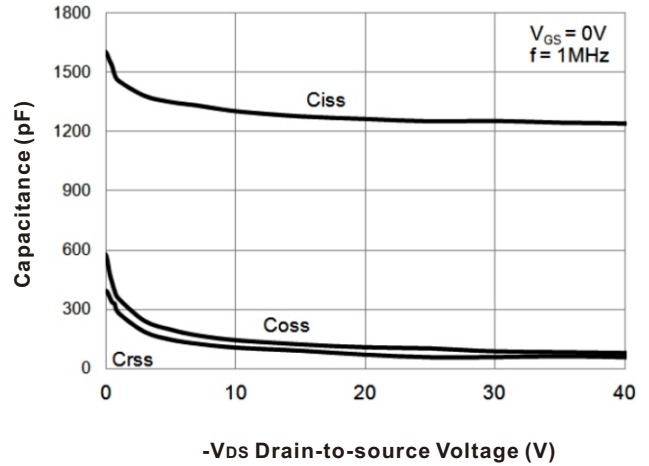


Fig.8 Capacitance Characteristics

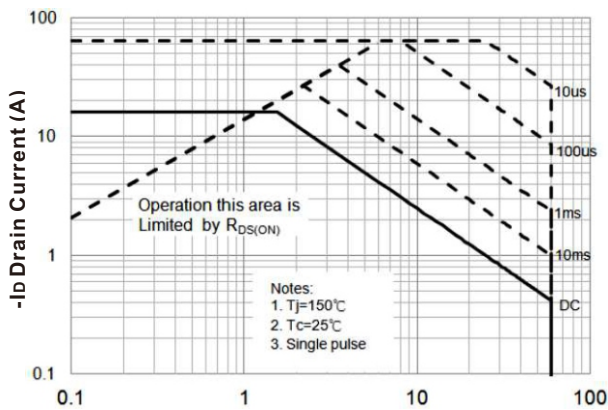


Fig.9 Safe Operating Area

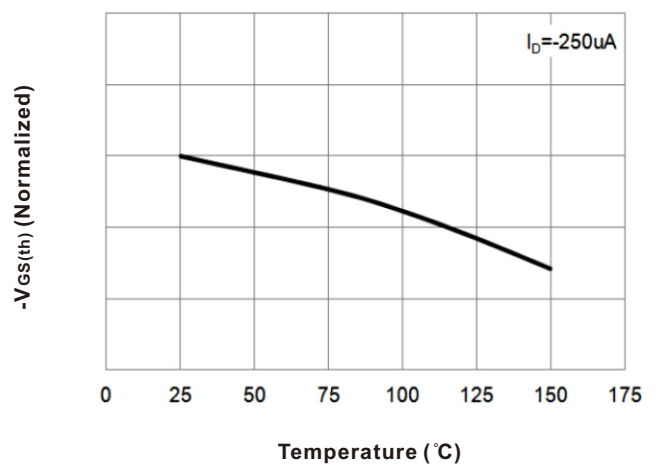


Fig.10 Normalized VGS(th) vs. Temperature

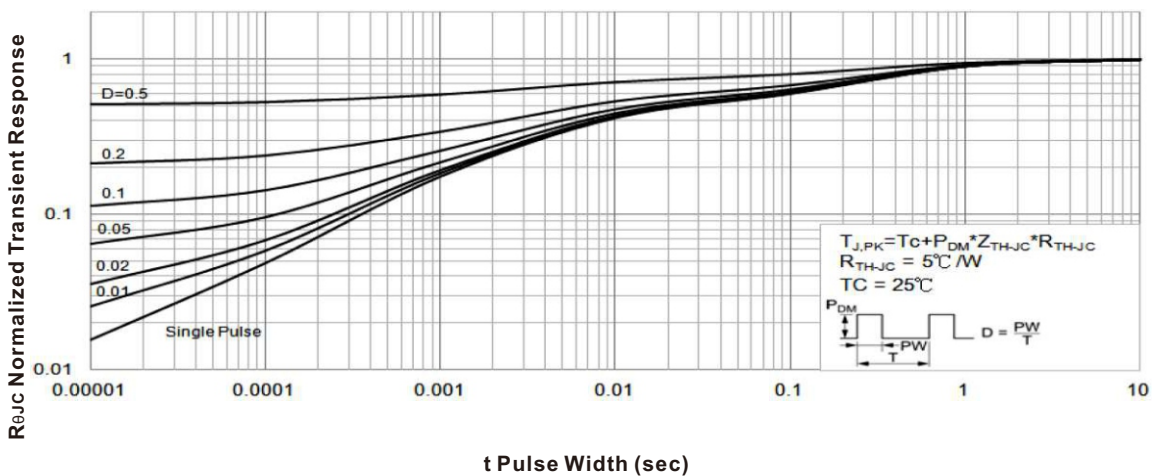
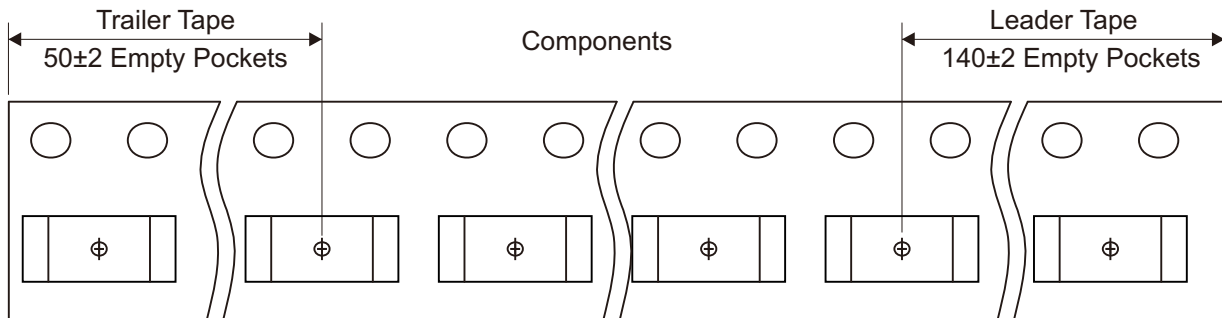
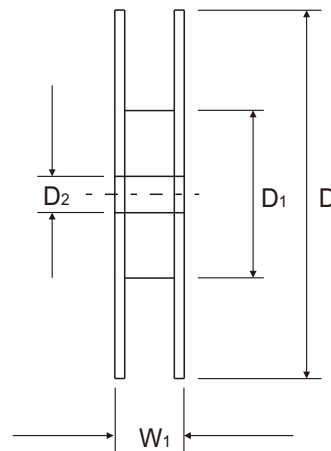
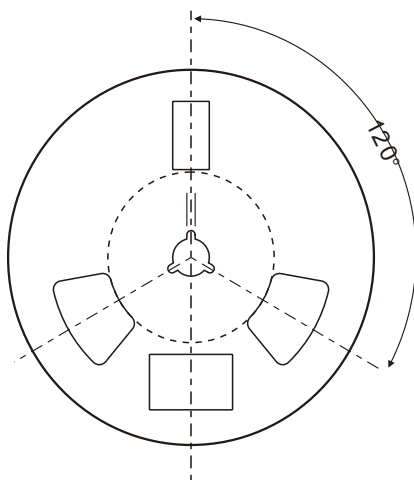
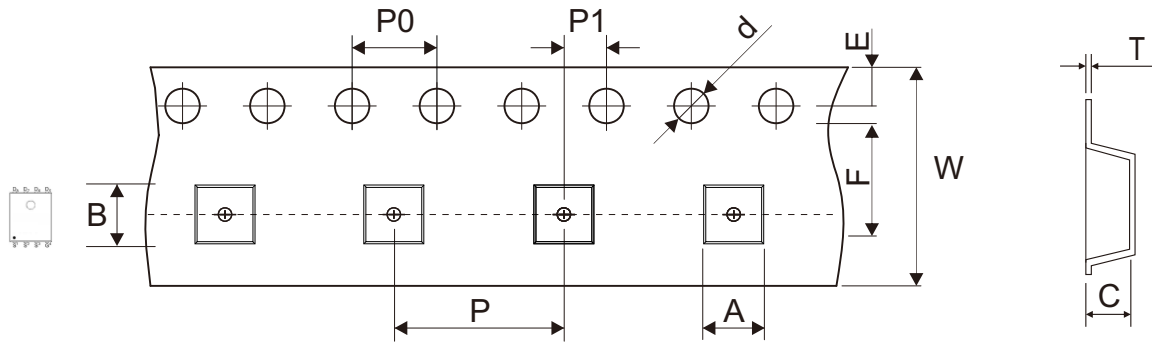


Fig.11 Normalized Maximum Transient Thermal Impedance

### Reel Taping Specification



DFN5x6 (PR-PAK)	Symbol	A	B	C	d	D	D1	D2
	(mm)	6.50 ± 0.10	5.30 ± 0.10	1.40 ± 0.10	1.50 ± 0.05	330.00 ± 2.00	178.00 ± 2.00	13.00 ± 1.00
	(inch)	0.256 ± 0.004	0.209 ± 0.004	0.055 ± 0.004	0.059 ± 0.002	12.992 ± 0.079	7.008 ± 0.079	0.512 ± 0.039

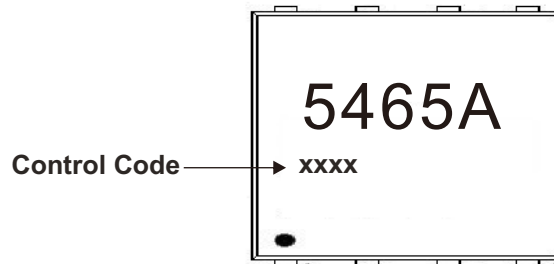
DFN5x6 (PR-PAK)	Symbol	E	F	P	P0	P1	T	W	W1
	(mm)	1.75 ± 0.10	5.50 ± 0.05	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.30 ± 0.05	12.00 ± 0.30	18.40 ± 1.00
	(inch)	0.069 ± 0.004	0.217 ± 0.002	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.012 ± 0.002	0.472 ± 0.012	0.724 ± 0.039

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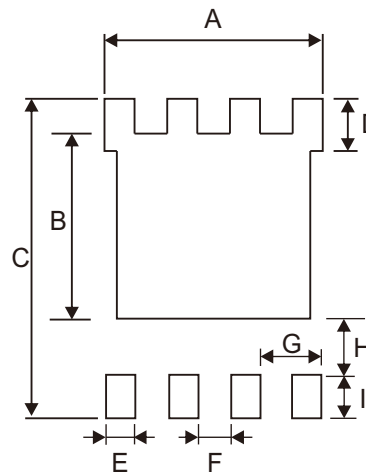
## Marking Code

Part Number	Marking Code
CMS16P06H8	5465A



## Suggested PAD Layout

Dimensions	Value (in mm)
A	4.420
B	3.810
C	6.610
D	1.020
E	0.610
F	0.660
G	1.270
H	0.820
I	1.270



Note:

1. The pad layout is for reference purposes only.

## Standard Packaging

Case Type	REEL PACK	
	REEL ( pcs )	Reel Size (inch)
DFN5x6 (PR-PAK)	3,000	13