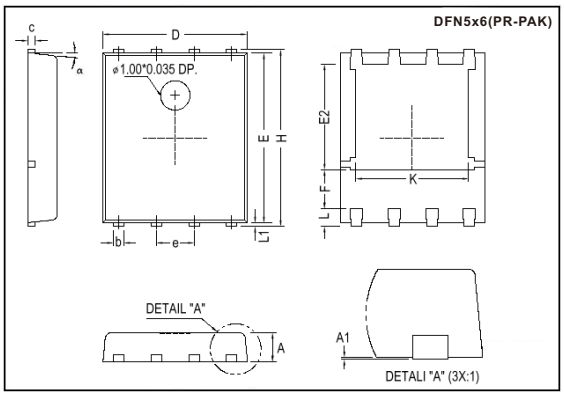
CMS70N04H8-HF

Description

The CMS70N04H8-HF is using trench DOMS technology. This advnaced technology has been especially tailored to minimize minimize $R_{DS(ON)}$, provide superior switching performance,and withstand high energy pulse in the avalanche and commutation mode. These devicesw are well suited for high efficiency fast switching applications.

The CMS70N04H8-HF meet the RoHS and Green Product requirement,100% EAS guaranteed with full function reliability approved.

Package Dimensions



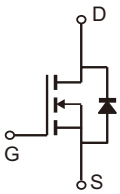
REF.	Millimeter			REF.	Millimeter		
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	0.85	1.00	1.15	E	5.70	-	5.90
A1	0.00	-	0.10	e	-	1.27	-
b	0.30	-	0.51	H	5.90	-	6.20
c	0.20	-	0.30	L	-	0.60	-
D	4.80	-	5.00	L1	0.06	-	0.20
F	1.10REF.			α	0°	-	12°
E2	3.50REF.			K	3.70	3.90	4.10

Features

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

Circuit diagram

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



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current[1]	I_D @T_C=25℃	70	A
	I_D @T_C=100℃	44	A
Pulsed Drain Current[1,2]	I_{DM}	280	A
Total Power Dissipation	P_D @T_C=25℃	72.3	W
	P_D @T_A=25℃	2	W
Single Pulse Avalanche Energy, L=0.1mH[3]	E_{AS}	61	mJ
Single Pulse Avalanche Current, L=0.1mH[3]	I_{AS}	35	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	℃

Thermal Data

Parameter	Symbol	Conditions	Max. Value	Unit
Thermal Resistance Junction-ambient[2]	$R_{\theta JA}$	Steady State	62.5	℃/W
Thermal Resistance Junction-case[2]	$R_{\theta JC}$	Steady State	1.73	℃/W

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Electrical Characteristics (T_J=25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	40	-	-	V	V_{GS}=0 , I_D=250uA
Gate Threshold Voltage	$V_{GS(th)}$	1.2	1.6	2.5	V	V_{DS}=V_{GS} , I_D=250uA
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V
Drain-Source Leakage Current(T_J=25℃)	I_{DSS}	-	-	1	uA	V_{DS}=40V , V_{GS}=0
Drain-Source Leakage Current(T_J=85℃)		-	-	10	uA	V_{DS}=32V , V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(on)}$	-	6.9	8.5	mΩ	V_{GS}=10V , I_D=20A
		-	9.1	12		V_{GS}=4.5V , I_D=10A
Total Gate Charge[2]	Q_g	-	19.7	-	nC	I_D=10A
Gate-Source Charge	Q_{gs}	-	2.8	-		V_{DS}=20V
Gate-Drain ("Miller") Change	Q_{gd}	-	5.1	-		V_{GS}=10V
Turn-on Delay Time[2]	$T_{d(on)}$	-	13.2	-	ns	V_{DD}=15V
Rise Time	T_r	-	2.2	-		I_D=1A
Turn-off Delay Time	$T_{d(off)}$	-	72	-		V_{GS}=10V
Fall Time	T_f	-	4.5	-		R_G=3.3Ω
Input Capacitance	C_{iss}	-	1278	-	pF	V_{GS}=0V
Output Capacitance	C_{oss}	-	135	-		V_{DS}=25V
Reverse Transfer Capacitance	C_{rss}	-	87	-		f=1.0MHz
Gate Resistance	R_g	-	2.2	-	Ω	f=1.0MHz

Guaranteed Avalanche Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Single Pulse Avalanche Energy[5]	EAS	16	-	-	mJ	V_{DD}=25V, L=0.1mH, I_{AS}=18A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage[2]	V_{DS}	-	-	1.2	V	I_S=20A , V_{GS}=0V , T_J=25℃
Continuous Source Current[1,6]	I_S	-	-	70	A	V_G=V_D=0V , Force Current
Pulsed Source Current[2,6]	I_{SM}	-	-	140	A	

Notes: 1.The data tested by surface mounted on a 1 $inch^2$ 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_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=35A.

4.The power dissipation is limited by 150℃ junction temperature.

5. The Min. value is 100% EAS tested guarantee.

6.The data is theoretically the same as ID and IDM,in real applications,should be limited by total power dissipation.

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Typical Characteristics

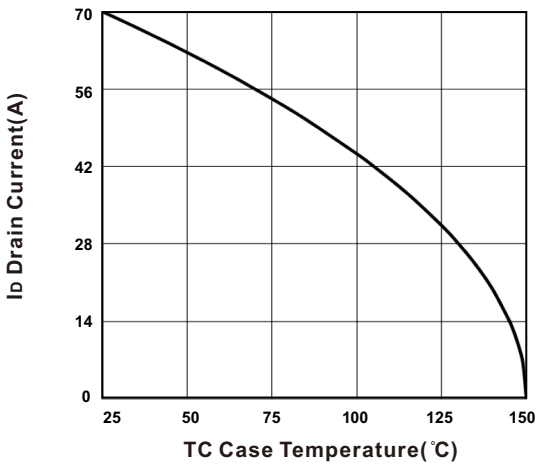


Fig.1 Drain Current vs.TC

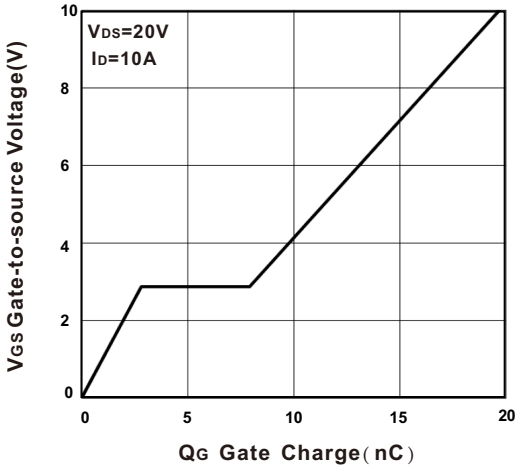


Fig.2 Gate Charge Characteristics

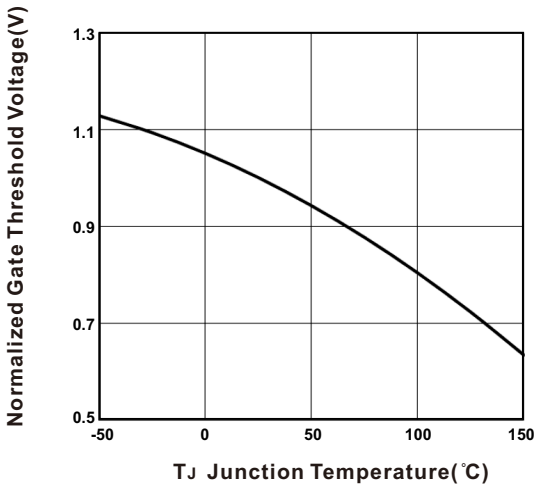


Fig.3 Normalized VGS(th) VS. TJ

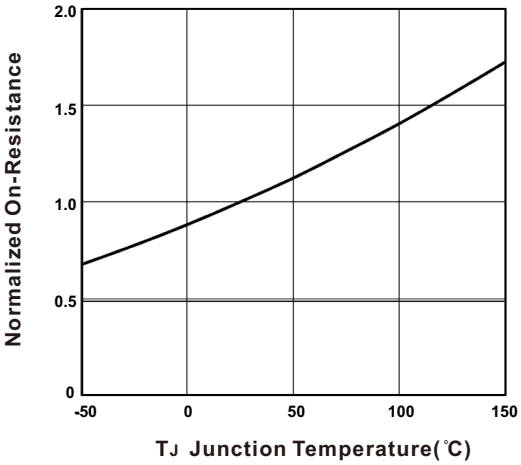


Fig.4 Normalized RDSON VS. TJ

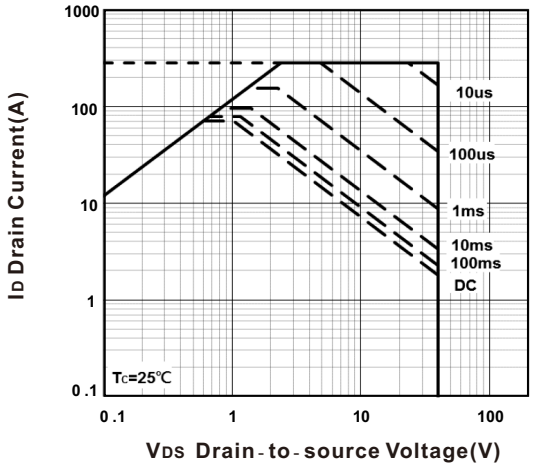


Fig.5 Safe Operating Area

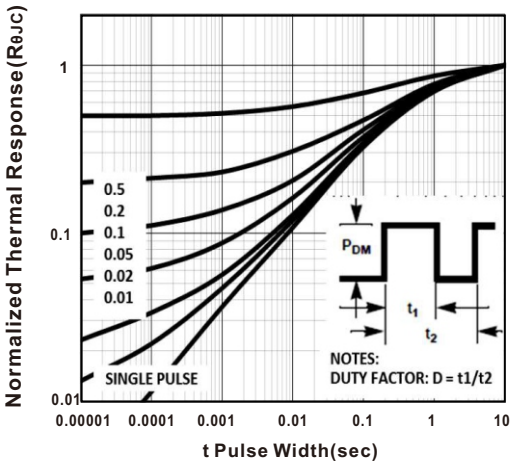


Fig.6 Transient Thermal Impedance

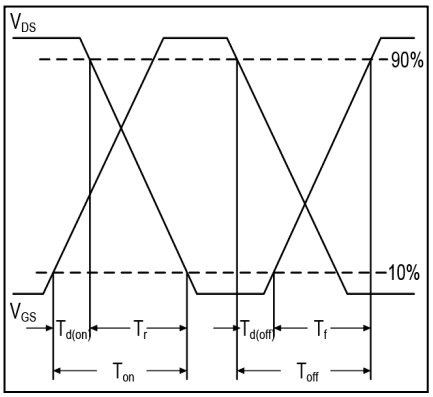


Fig. 7 Switching Time Waveform

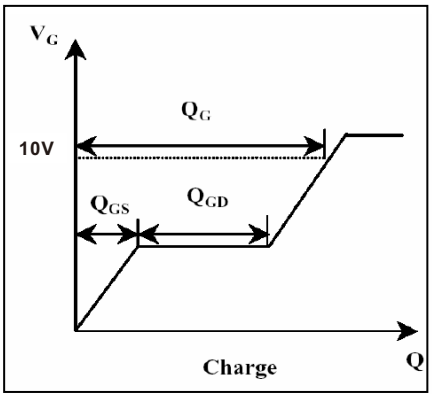
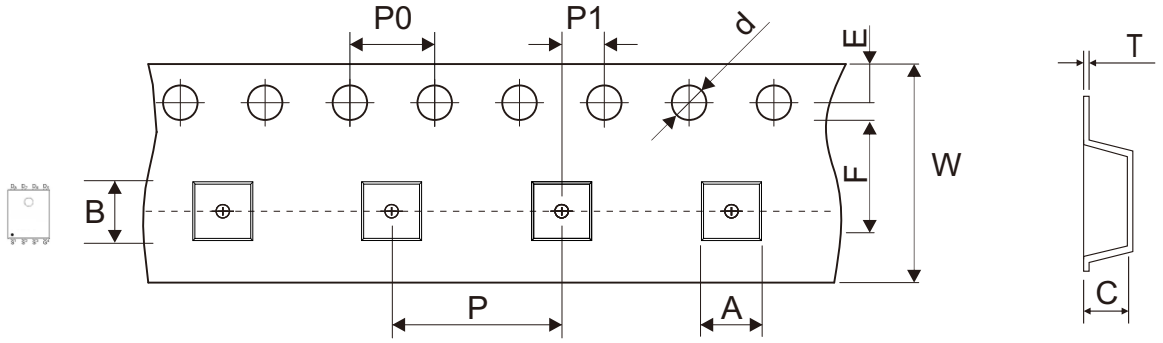
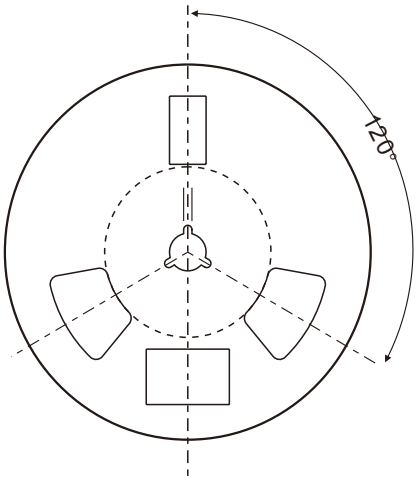
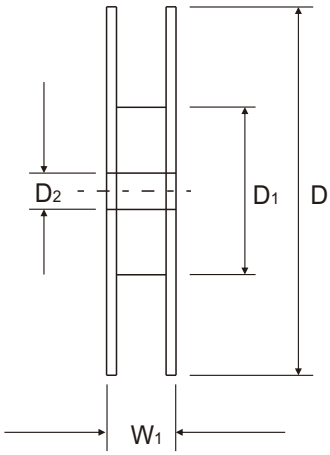


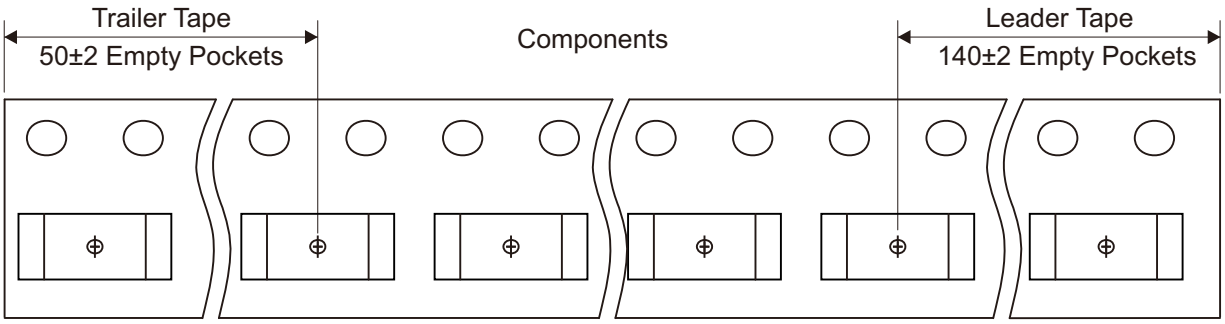
Fig. 8 Gate Charge Waveform

Reel Taping Specification









	Symbol	A	B	C	d	D	D1	D2
DFN5x6 (PR-PAK)	(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

	Symbol	E	F	P	P0	P1	T	W	W1
DFN5x6 (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 ± 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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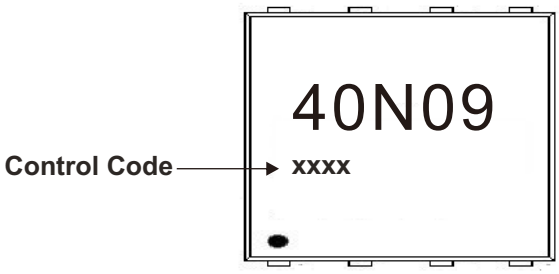
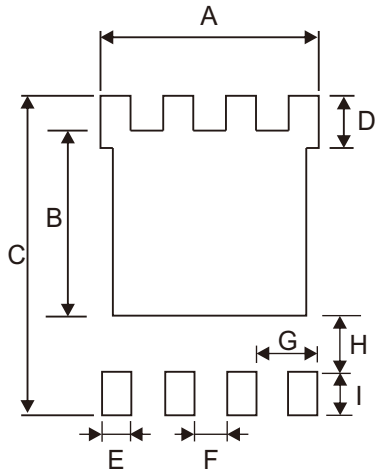
Marking Code

Part Number	Marking Code
CMS70N04H8	40N09



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

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
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