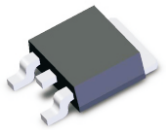
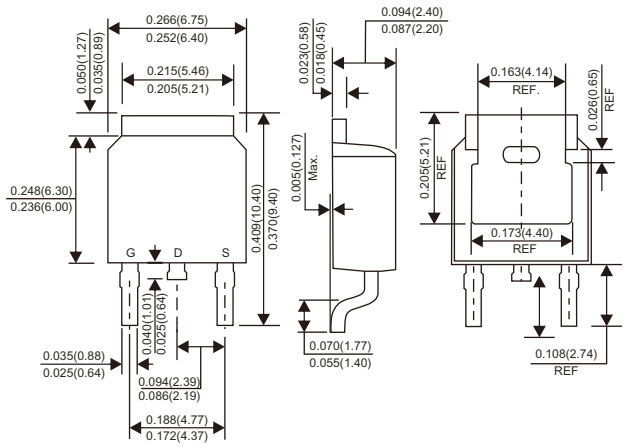
MOSFET

CMS16N06D-HF

N-Channel
RoHS Device
Halogen Free



D-PAK(TO-252)



Dimensions in inches and (millimeters)

Features

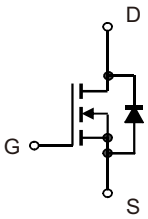
-Low Reverse Transfer Capacitance
-High Switching Speed
-Improved dv/dt Capability
-100% EAS Guaranteed
-Green Device Available

Description

The CMS16N06D is the highest performance N-CH MOSFET with super high dense cell design for extremely low R_{DS}(on) and gate charge for most of the synchronous buck converter applications.
The CMS16N06D meet the RoHS and green product requirement, 100% EAS guaranteed with full function reliability approved.

Circuit diagram

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



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1]	I_D @T_C=25℃	16	A
	I_D @T_C=100℃	10	A
Pulsed Drain Current[1,2]	I_{DM} @T_C=25℃	64	A
Continuous Drain Current	I_D @T_A=25℃	4.4	A
	I_D @T_A=70℃	3.5	A
Total Power Dissipation[4]	P_D @T_C=25℃	27	W
	P_D @T_A=25℃	2	W
Single Pulse Avalanche Energy, L=0.1mH[3]	E_{AS}	11	mJ
Single Pulse Avalanche Current, L=0.1mH[3]	I_{AS}	15	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[1]	$R_{\theta JA}$	Steady State	62.5	°C/W
Thermal Resistance Junction-case[1]	$R_{\theta JC}$	Steady State	4.6	°C/W

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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	V_{GS}=0, I_D=250uA
Gate Threshold Voltage	$V_{GS(th)}$	1.0	1.8	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	I_{DSS}	-	-	1	uA	V_{DS}=60V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	37	50	mΩ	V_{GS}=10V, I_D=8A
		-	42	60		V_{GS}=4.5V, I_D=4A
Total Gate Charge[2]	Q_g	-	14	-	nC	I_D=4A V_{DS}=30V V_{GS}=10V
Gate-Source Charge	Q_{gs}	-	2.9	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	2.3	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	3.9	-	ns	V_{DS}=30V I_D=1A V_{GS}=10V R_G=3.3Ω
Rise Time	T_r	-	13	-		
Turn-o ffDelay Time	$T_{d(off)}$	-	23	-		
Fall Time	T_f	-	6.7	-		
Input Capacitance	C_{iss}	-	815	-	pF	V_{GS}=0V V_{DS}=15V f=1.0MHz
Output Capacitance	C_{oss}	-	379	-		
Reverse Transfer Capacitance	C_{rss}	-	110	-		

Guaranteed Avalanche Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Single Pulse Avalanche Energy[5]	EAS	3.2	-	-	mJ	V_{DD}=25V, L=0.1mH, I_{AS}=8A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage[2]	V_{SD}	-	0.73	1.0	V	I_S=1A, V_{GS}=0V, T_J=25℃
Continuous Source Current[1,6]	I_S	-	-	16	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 conditi on is VDD=25V, VGS=10V, L=0.1mH, IAS=15A.

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.

RATING AND CHARACTERISTIC CURVES

Typical Characteristics

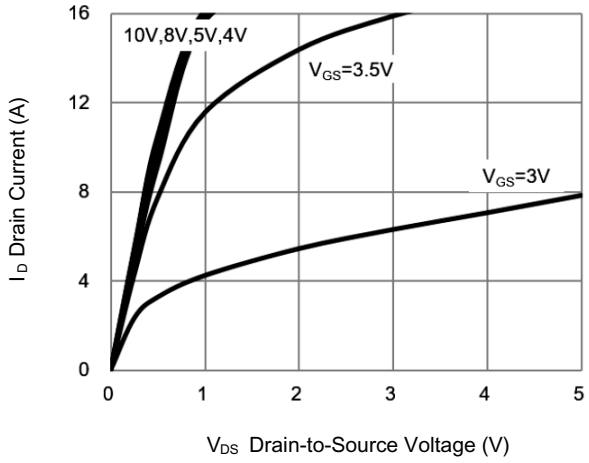


Fig.1 Typical Output Characteristics

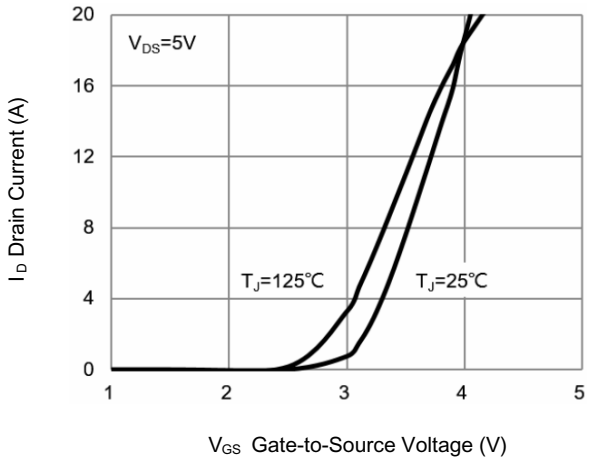


Fig.2 Transfer Characteristics

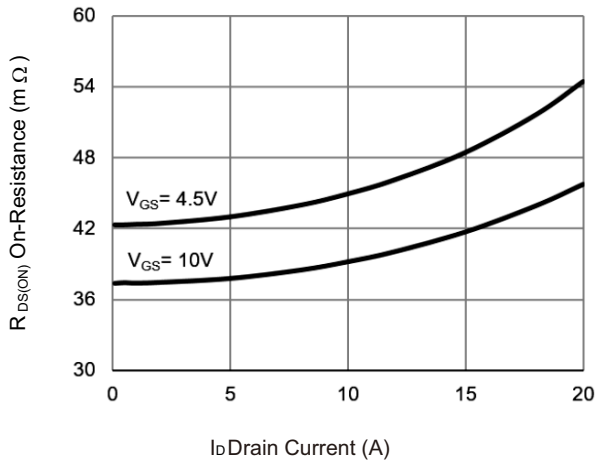


Fig.3 On-Resistance vs. Drain Current

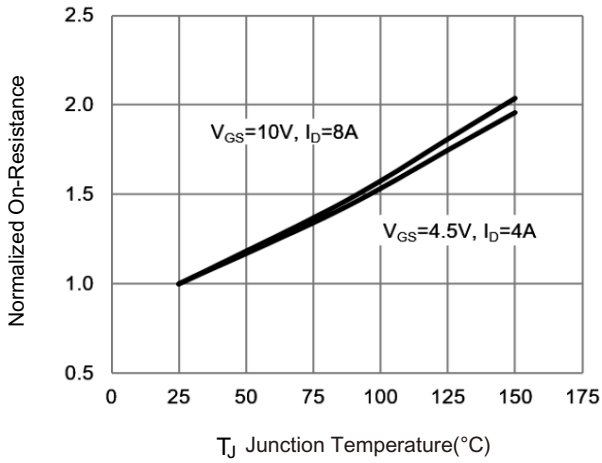


Fig.4 Normalized RDSON vs. T_J

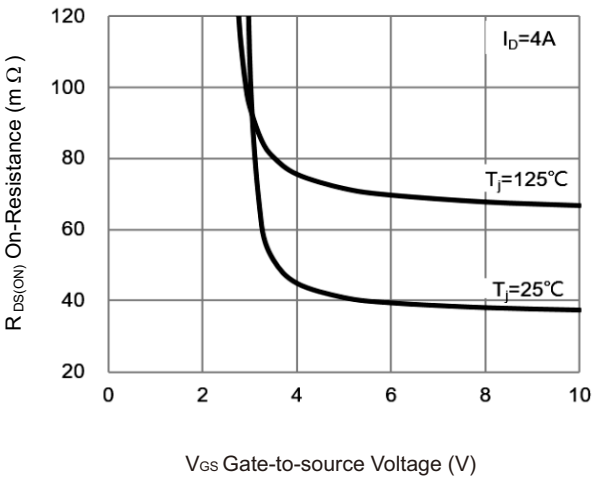


Fig.5 On-Resistance vs. G-S Voltage

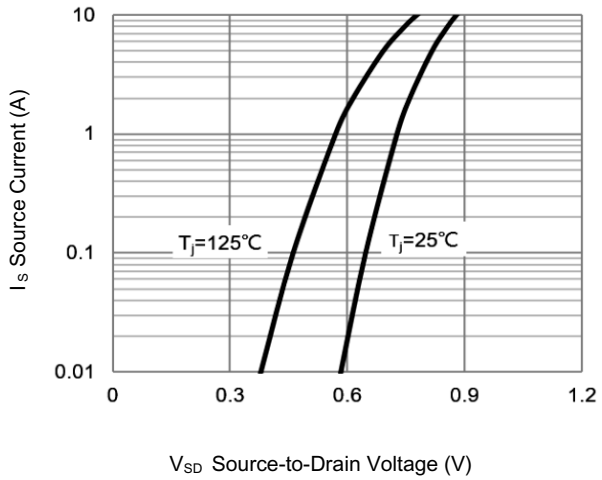


Fig.6 Forward Characteristics of Reverse

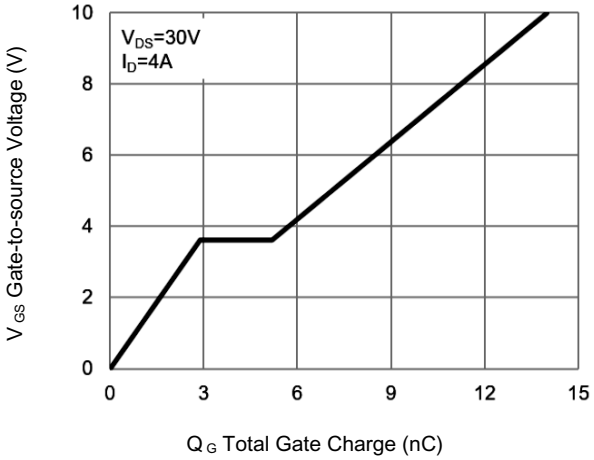


Fig.7 Gate Charge Characteristics

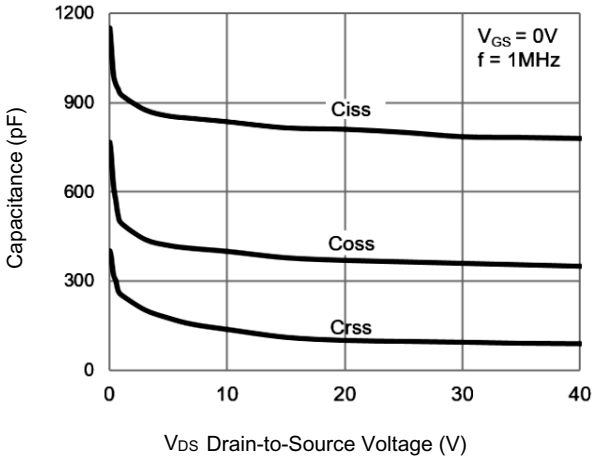


Fig.8 Capacitance Characteristics

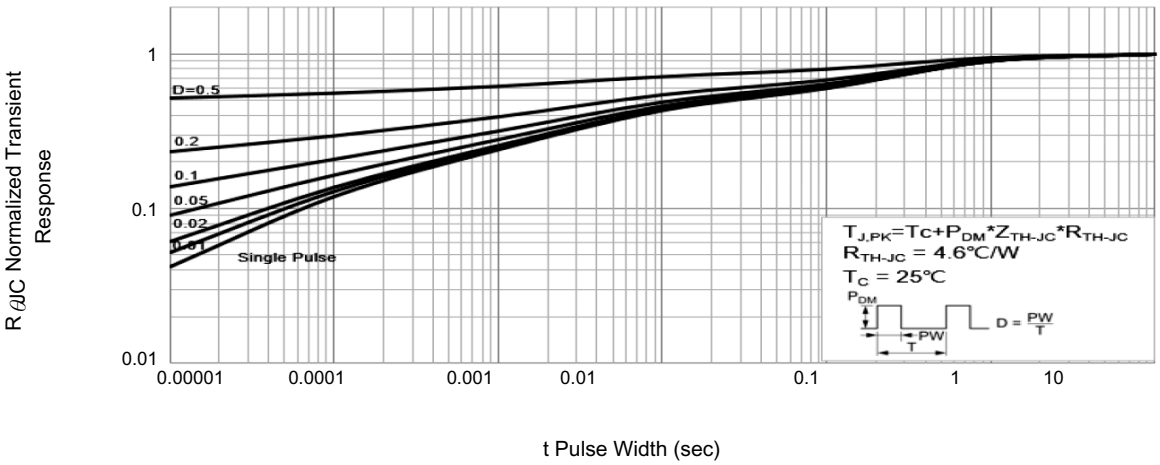


Fig.9 Normalized Maximum Transient Thermal Impedance

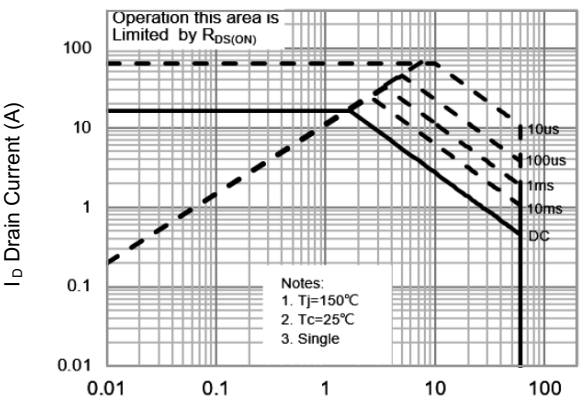


Fig.10 Sa fe Operating Area

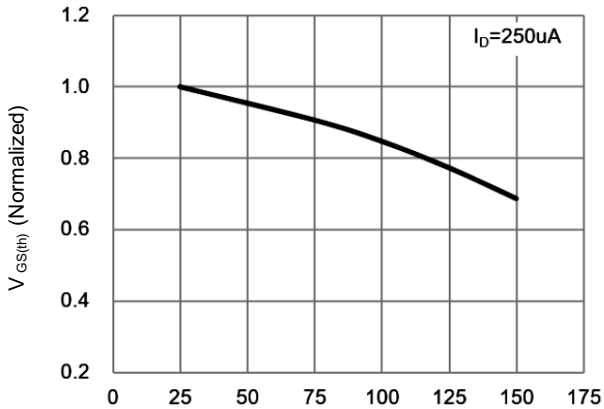
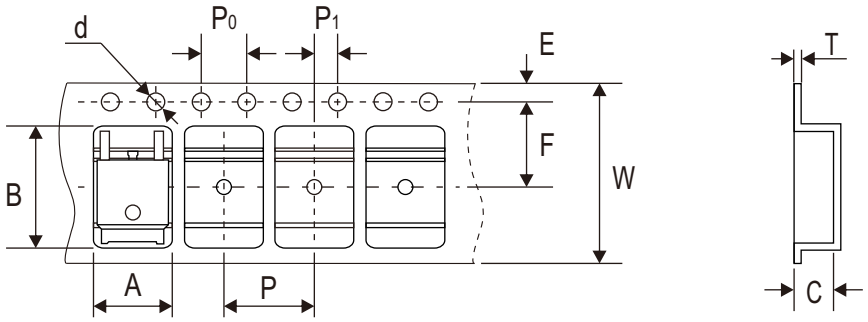
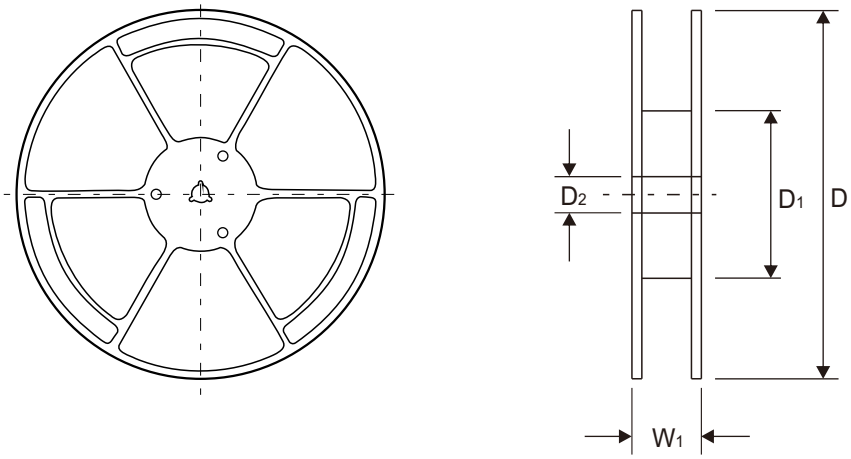
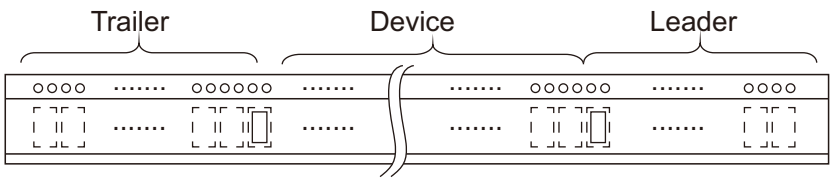


Fig.11 Normalized VGS(th) vs. Temperature

Reel Taping Specification





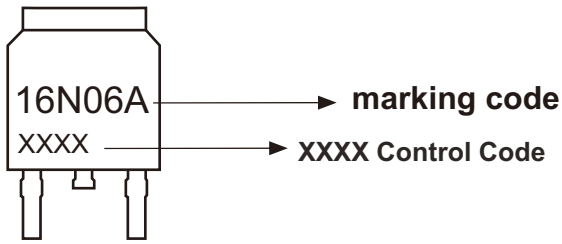


	SYMBOL	A	B	C	d	D	D1	D2
TO-252 (D-PAK)	(mm)	6.90 ± 0.10	10.50 ± 0.10	2.70 ± 0.10	1.55 ± 0.05	330.00 ± 2.00	100.00 ± 2.00	13.00 ± 1.00
	(inch)	0.272 ± 0.004	0.413 ± 0.004	0.106 ± 0.004	0.061 ± 0.002	12.992 ± 0.079	3.937 ± 0.079	0.512 ± 0.039

	SYMBOL	E	F	P	P0	P1	T	W	W1
TO-252 (D-PAK)	(mm)	1.75 ± 0.10	7.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	0.30 ± 0.05	16.00 ± 0.10	21.00 ± 1.00
	(inch)	0.069 ± 0.004	0.295 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.012 ± 0.002	0.630 ± 0.004	0.827 ± 0.039

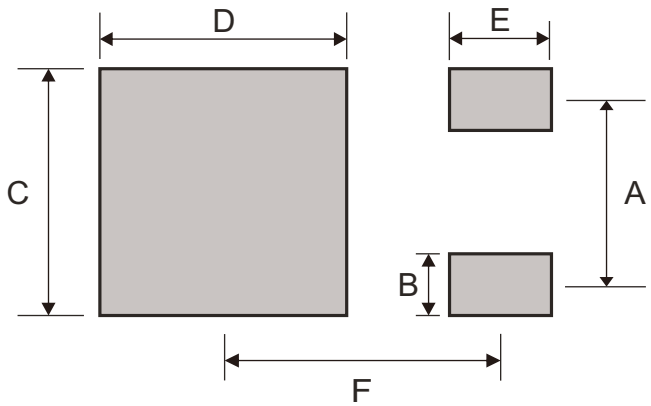
Marking Code

Part Number	Marking Code
CMS16N06D-HF	16N06A



Suggested PAD Layout

SIZE	TO-252 / DPAK	
	(mm)	(inch)
A	4.60	0.181
B	1.40	0.055
C	6.00	0.236
D	6.50	0.256
E	3.00	0.118
F	6.25	0.246



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	REEL SIZE (inch)
TO-252/D-PAK	2,500	13