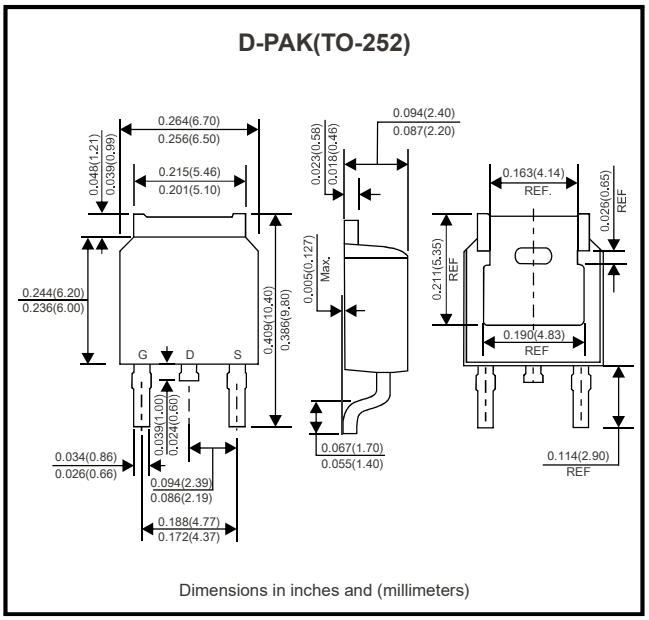
CMS25N10D-HF

N-Channel
RoHS Device
Halogen Free



Features

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

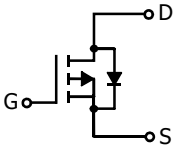
Description

The CMS25N10D is the highest performance N-ch MOSFET s with super high dense cell design for extremely low $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The CMS25N10D meet the RoHS and Green Product requir ement,
100% EAS guaranteed with full function reliability approved.

Circuit diagram

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



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1]	I_D @T_C=25℃	25	A
	I_D @T_C=100℃	15	A
Pulsed Drain Current[1,2]	I_{DM} @T_C=25℃	100	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℃	60	W
	P_D @T_A=25℃	2	W
Single Pulse Avalanche Energy, L=0.1mH[3]	E_{AS}	26.4	mJ
Single Pulse Avalanche Current, L=0.1mH[3]	I_{AS}	23	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	℃/W
Thermal Resistance Junction-case[1]	$R_{\theta JC}$	Steady State	2.0	℃/W

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	100	-	-	V	V_{GS}=0, I_D=250uA
Gate Threshold Voltage	$V_{GS(th)}$	1.0	1.7	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}=80V, V_{GS}=0
Drain-Source Leakage Current(T_J=55℃)		-	-	100		V_{DS}=80V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	-	48	mΩ	V_{GS}=10V, I_D=25A
		-	-	50		V_{GS}=4.5V, I_D=15A
Total Gate Charge[2]	Q_g	-	60	-	nC	I_D=20A V_{DS}=80V V_{GS}=10V
Gate-Source Charge	Q_{gs}	-	9.7	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	11.8	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	10.4	-	ns	V_{DD}=50V I_D=20A V_{GS}=10V R_G=3.3Ω
Rise Time	T_r	-	46	-		
Turn-off Delay Time	$T_{d(off)}$	-	54	-		
Fall Time	T_f	-	10	-		
Input Capacitance	C_{iss}	-	3848	-	pF	V_{GS}=0V V_{DS}=15V f=1.0MHz
Output Capacitance	C_{oss}	-	137	-		
Reverse Transfer Capacitance	C_{rss}	-	82	-		
Gate Resistance	R_g	-	1.6	3.2	Ω	f=1.0MHz

Guaranteed Avalanche Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Single Pulse Avalanche Energy[5]	EAS	5	-	-	mJ	V_{DD}=25V, L=0.1mH, I_{AS}=10A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage[2]	V_{SD}	-	0.7	1.0	V	I_S=1A, V_{GS}=0V, T_J=25℃
Continuous Source Current[1,6]	I_S	-	-	25	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 VDD=25V, VGS=10V, L=0.1mH, IAS=23A.

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

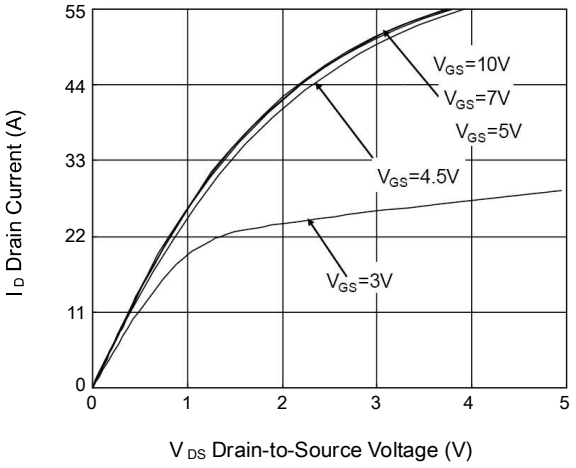


Fig.1 Typical Output Characteristics

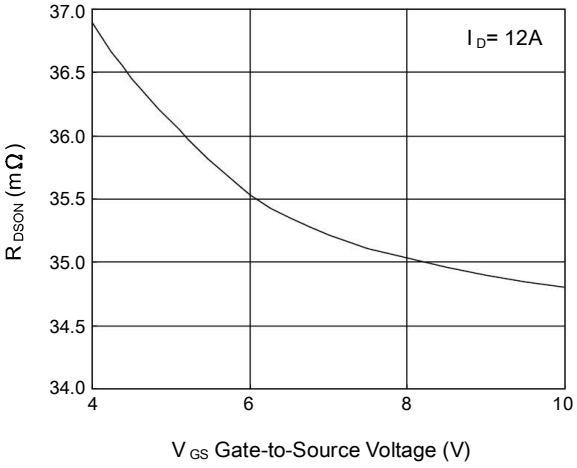


Fig.2 On-Resistance vs. G-S Voltage

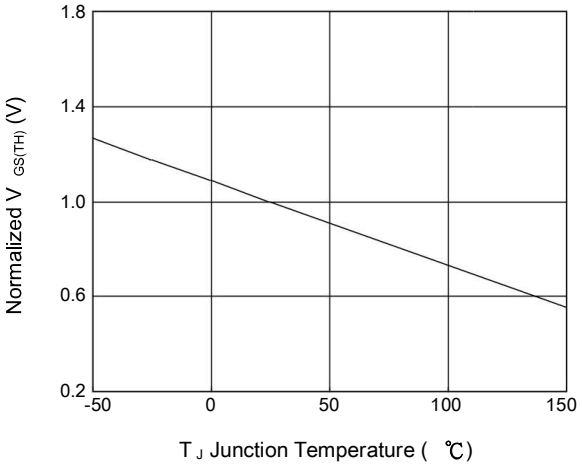


Fig.3 Normalized $V_{GS(th)}$ vs. T_J

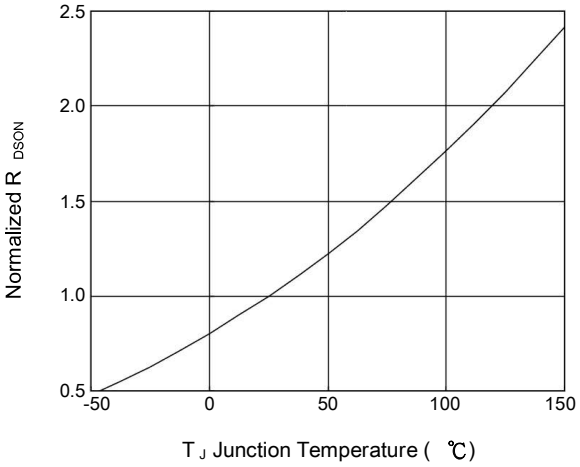


Fig.4 Normalized R_{DSON} vs. T_J

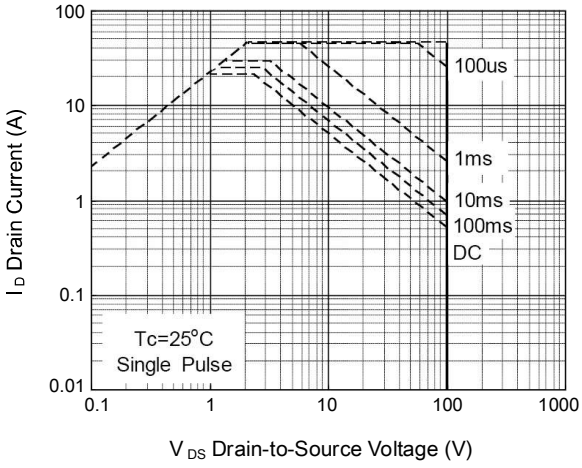


Fig.5 Safe Operating Area

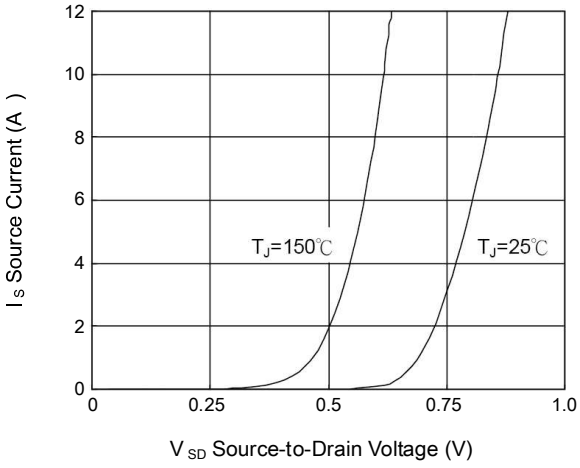


Fig.6 Forward Characteristics of Reverse

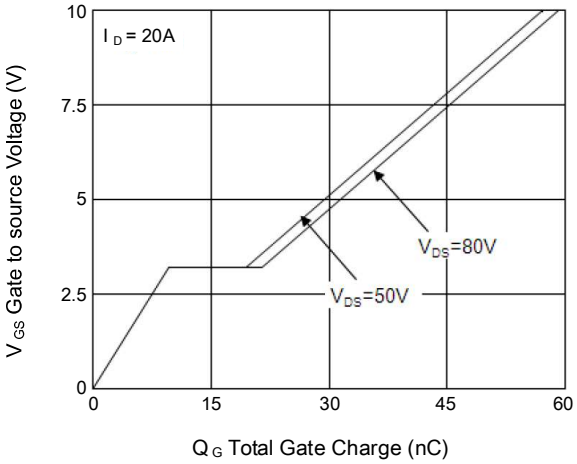


Fig.7 Gate Charge Characteristics

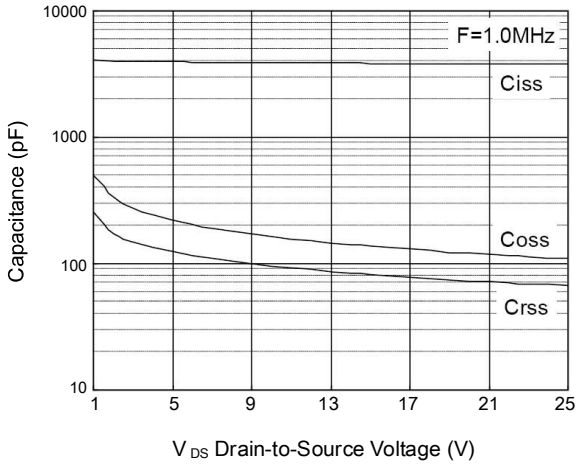


Fig.8 Capacitance Characteristics

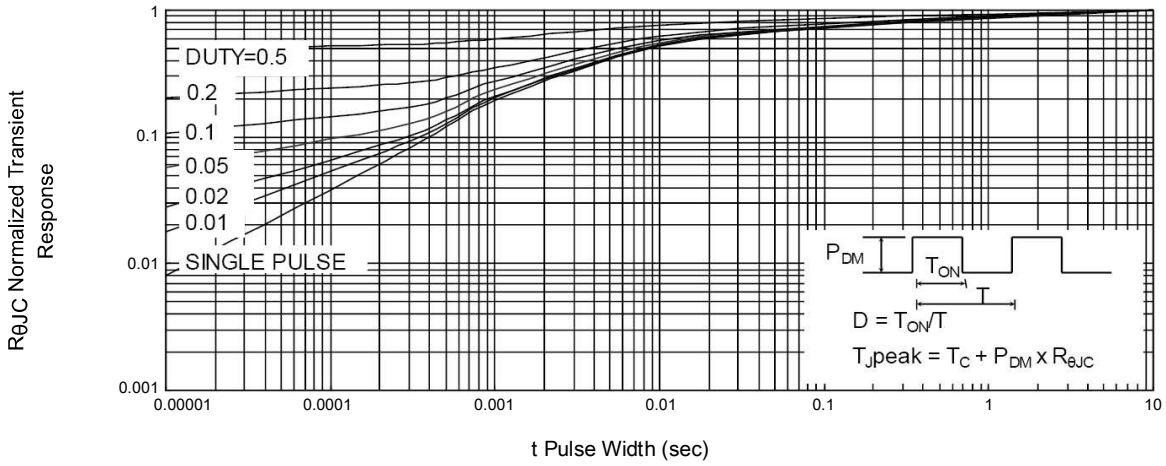


Fig.9 Normalized Maximum Transient Thermal Impedanc e

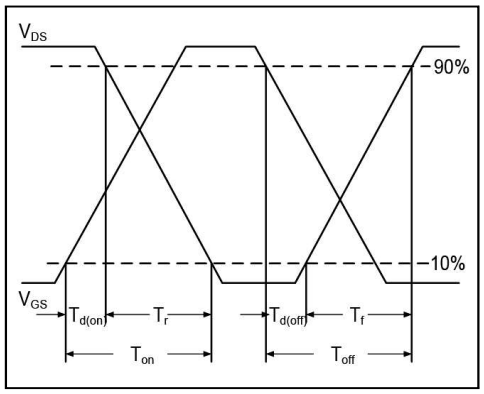


Fig.10 Switching Time Waveform

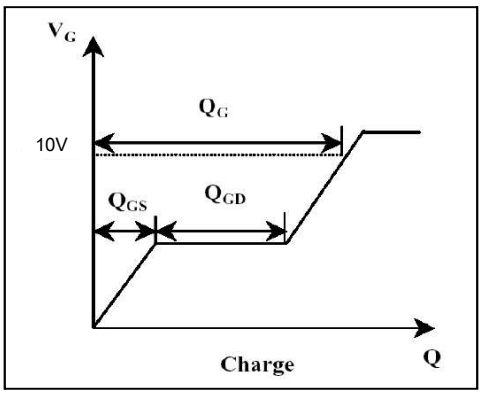
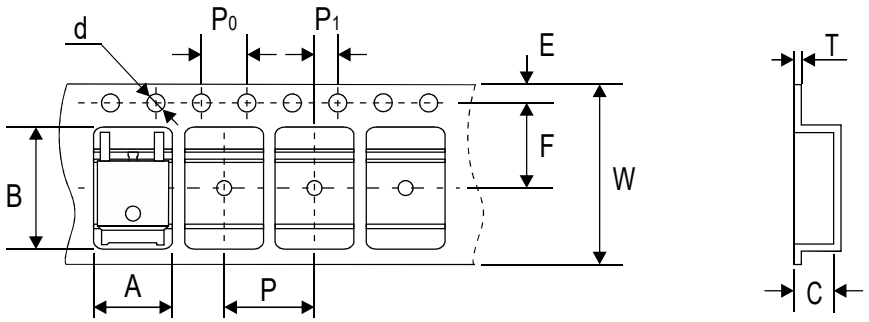
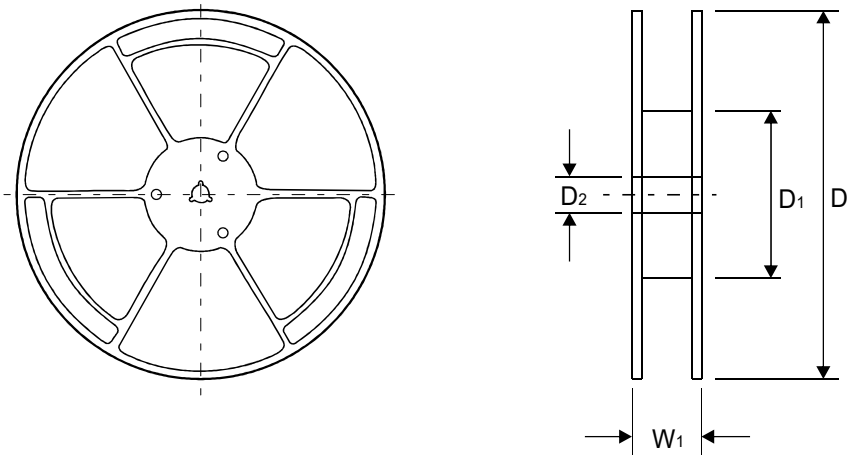
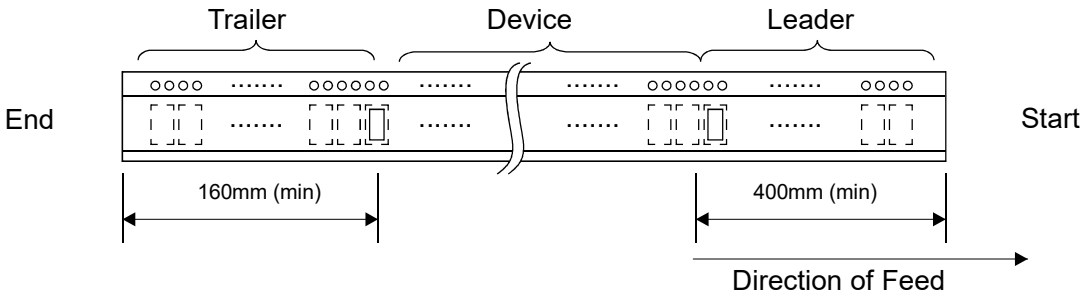


Fig.11 Gate Charge Waveform

Reel Taping Specification





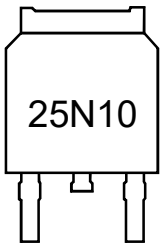


	SYMBOL	A	B	C	d	D	D1	D2
TO-252 (D-PAK)	(mm)	6.90 ± 0.10	10.50 ± 0.10	2.70 ± 0.10	1.55 ± 0.05	330.00 ± 2.00	100.00 ± 1.00	13.00 ± 1.00
	(inch)	0.272 ± 0.004	0.413 ± 0.004	0.106 ± 0.004	0.061 ± 0.002	12.992 ± 0.079	3.937 ± 0.039	0.512 ± 0.039

	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

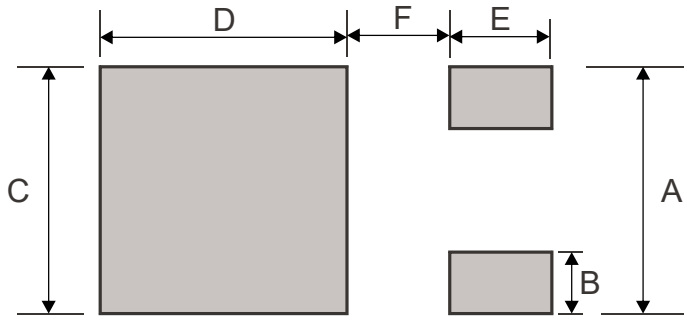
Marking Code

Part Number	Marking Code
CMS25N10D-HF	25N10



Suggested PAD Layout

SIZE	TO-252 / DPAK	
	(mm)	(inch)
A	6.17	0.243
B	1.60	0.063
C	5.80	0.228
D	6.20	0.244
E	3.00	0.118
F	2.58	0.101



Standard Packaging

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