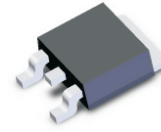


CMS50N10D-HF

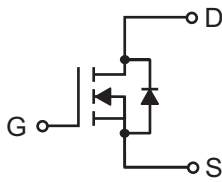
**N-Channel
RoHS Device
Halogen Free**



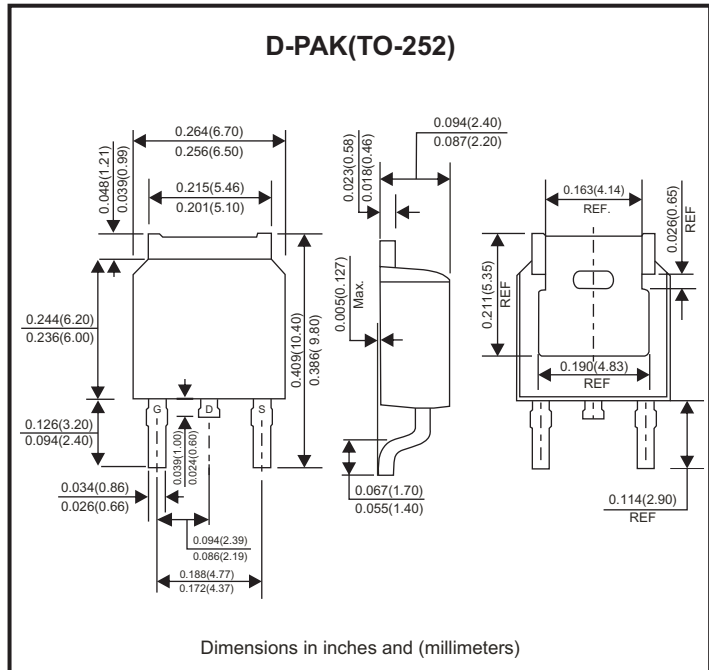
Features

- Simple drive requirement.
- Low gate charge.
- Fast switching characteristic.
- Repetitive avalanche rated.

Circuit diagram



G : GATE
S : SOURCE
D : DRAIN



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

Parameter	Symbol	Value	Units
Drain-source voltage	V _{DS}	100	V
Gate-source voltage	V _{GS}	±20	V
Continuous drain current @ V _{GS} = 10V	I _D	T _C = 25°C	50
		T _C = 100°C	35
Pulsed drain current (Note 1)	I _{DM}	150	A
Avalanche current	I _{AS}	30	A
Avalanche energy @ L=0.1mH, I _D =30A, R _G =25Ω	E _{AS}	45	mJ
Repetitive avalanche energy @ L=0.05mH (Note 2)	E _{AR}	22.5	mJ
Power dissipation	P _D	T _C = 25°C	130
		T _C = 100°C	65
Thermal resistance from junction to ambient	R _{θJA}	75	°C/W
Thermal resistance from junction to case	R _{θJC}	1.15	°C/W
Operating junction temperature	T _J	-55 to 175	°C
Storage temperature	T _{STG}	-55 to +175	°C

Note: 1. Pulse width limited by maximum junction temperature.
2. Duty cycle ≤ 1%.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.4	2.0	V
Gate-body leakage current	I_{GSS}	$V_{GS}=\pm 20V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$			1	μA
		$V_{DS}=70V, V_{GS}=0V, T_J=125^\circ C$			25	
Drain-source on-states resistance (Note 1)	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$		19	30	m Ω
		$V_{GS}=5V, I_D=20A$		20	35	
Forward transconductance	g_{FS}	$V_{DS}=5V, I_D=30A$		38		S
Dynamic						
Input capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$		2003		pF
Output capacitance	C_{oss}			218		
Reverse transfer capacitance	C_{rss}			128		
Turn-on delay time (Note 1)	$t_{d(on)}$	$V_{DS}=50V, I_D=1A$ $V_{GS}=10V, R_G=6\Omega$		20		ns
Rise time (Note 1)	t_r			100		
Turn-off delay time (Note 1)	$t_{d(off)}$			100		
Fall time (Note 1)	t_f			55		
Total gate charge (Note 1)	Q_g	$V_{DS}=50V, I_D=30A$ $V_{GS}=10V$		24		nC
Gate-soutce charge (Note 1)	Q_{gs}			6.5		
Gate-drain charge (Note 1)	Q_{gd}			8.1		
Gate resistance	R_g	$V_{DS}=0V, V_{GS}=15mV, f=1MHz$		2		Ω
Source-Drain Diode						
Diode forward voltage (Note 1)	V_{SD}	$I_F=I_S, V_{GS}=0V$			1.3	V
Continuous souce-drain diode current	I_S	(Note 1)			50	A
Pulse diode forward current	I_{SM}	(Note 1)			150	

Note: 1. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

TYPICAL RATING AND CHARACTERISTIC CURVES (CMS50N10D-HF)

Fig.1 - Typical Output Characteristics

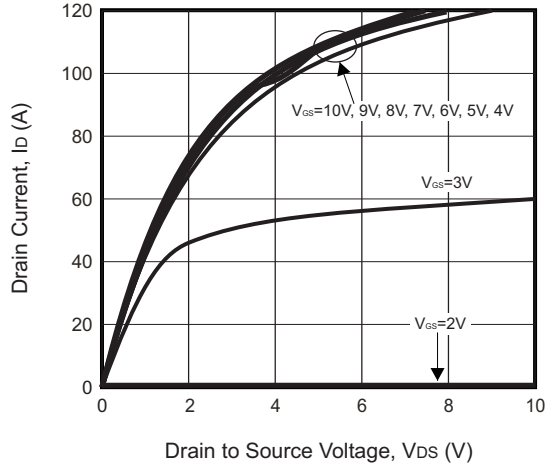


Fig.2 - Static Drain-Source On-State Resistance vs. Drain Current

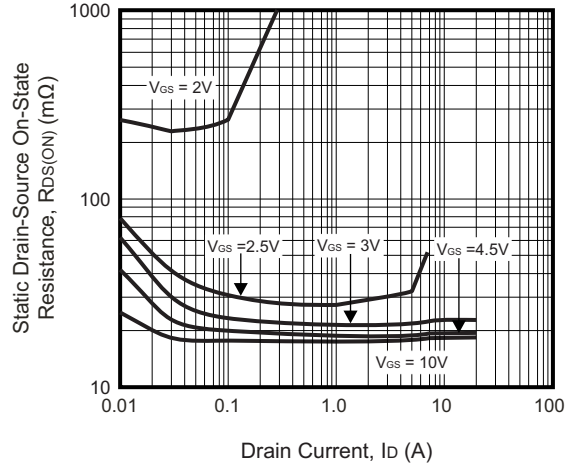


Fig.3 - Static Drain-Source On-State Resistance vs. Gate-Source Voltage

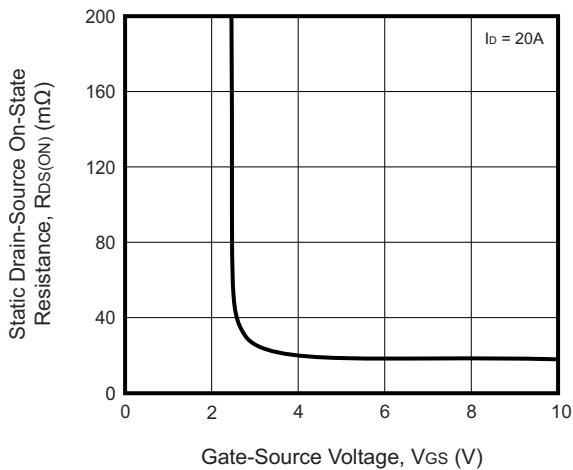


Fig.4 - Capacitance vs. Drain-Source Voltage

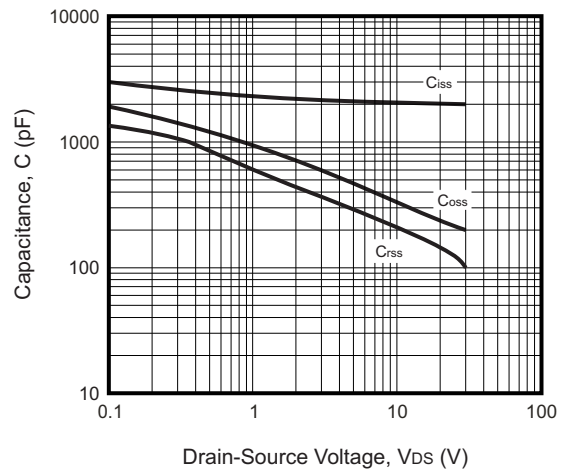


Fig.5 - Forward Transfer Admittance vs. Drain Current

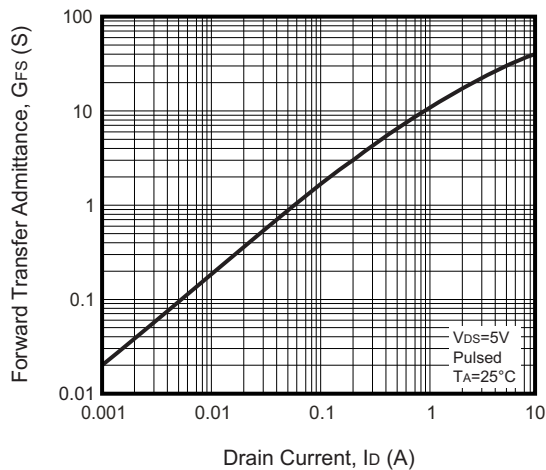
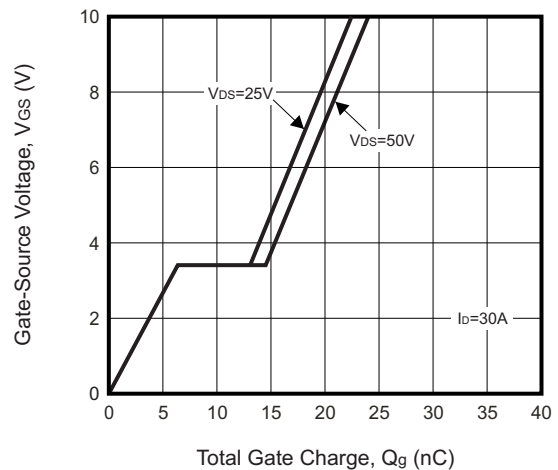


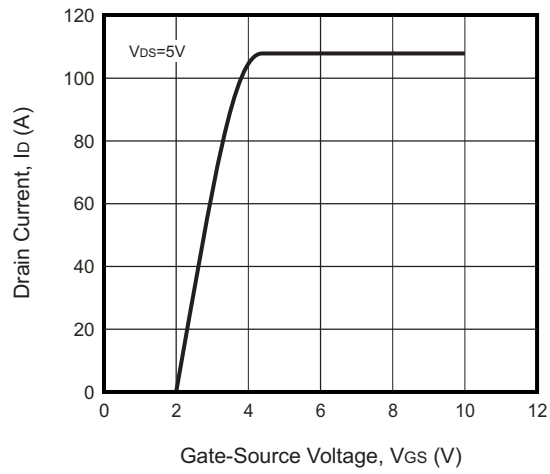
Fig.6 - Gate Charge Characteristics



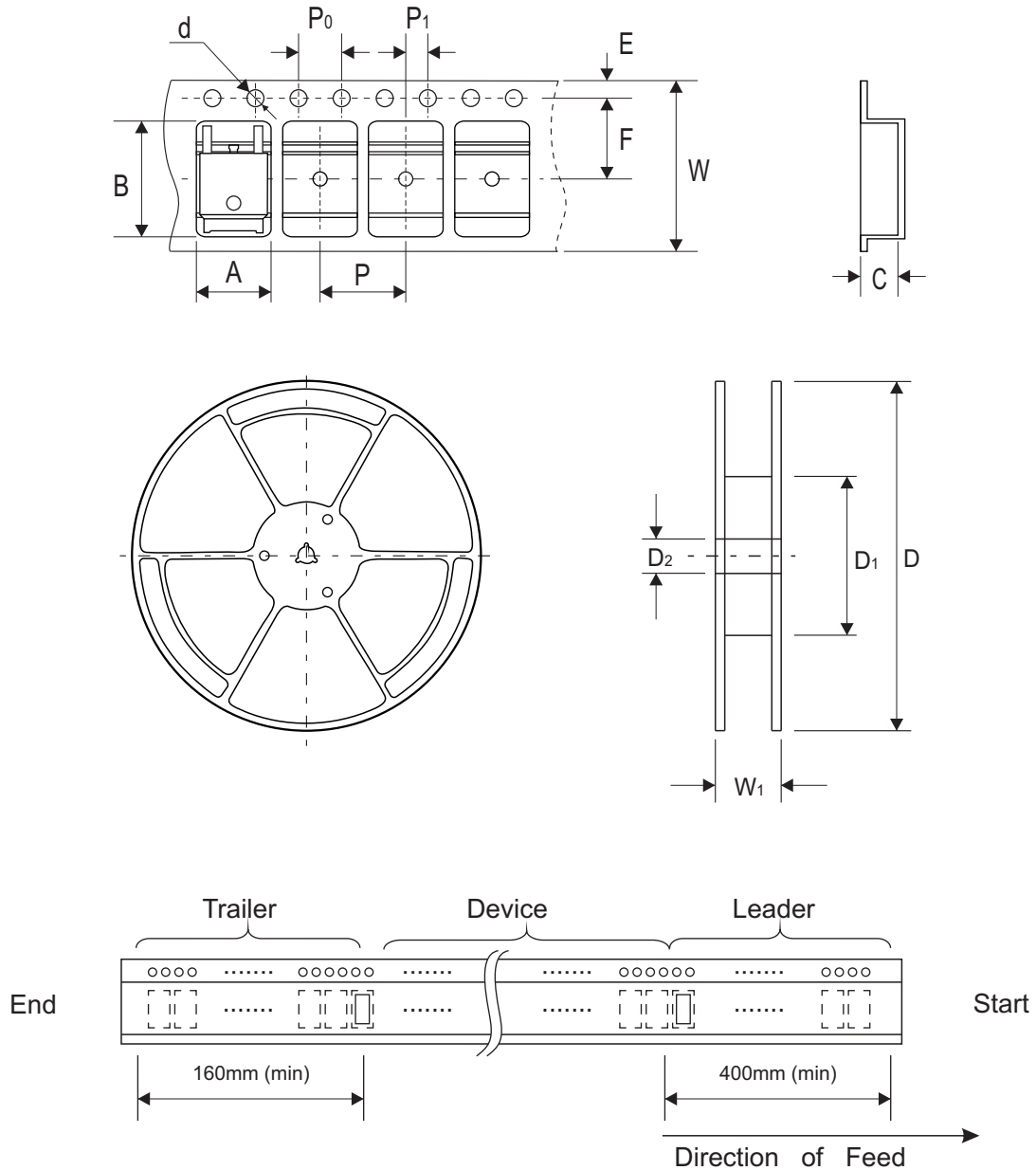
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TYPICAL RATING AND CHARACTERISTIC CURVES (CMS50N10D-HF)

Fig.7 - Typical Transfer Characteristics



Reel Taping Specification



TO-252 (DPAK)	SYMBOL	A	B	C	d	D	D ₁	D ₂
	(mm)	6.90 ± 0.10	10.50 ± 0.10	2.70 ± 0.10	1.55 ± 0.05	330 ± 2.00	100 ± 1.00	21.00 ± 1.00
	(inch)	0.271 ± 0.004	0.413 ± 0.004	0.106 ± 0.004	0.061 ± 0.002	13.00 ± 0.079	3.937 ± 0.039	0.827 ± 0.039

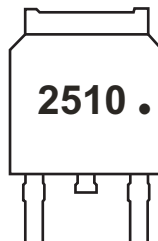
TO-252 (DPAK)	SYMBOL	E	F	P	P ₀	P ₁	W	W ₁
	(mm)	1.75 ± 0.10	7.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	16.00 ± 0.10	21.00 ± 1.00
	(inch)	0.069 ± 0.004	0.295 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.630 ± 0.004	0.827 ± 0.039

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REV: A

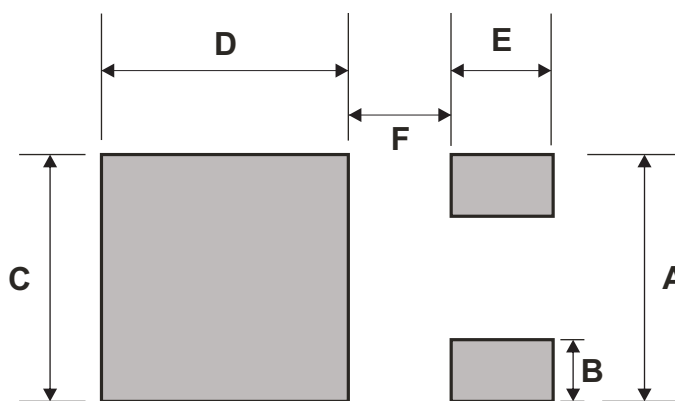
Marking Code

Part Number	Marking Code
CMS50N10D-HF	2510 .



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 / DPAK	2,500	13