

CMS25N03Q8-HF

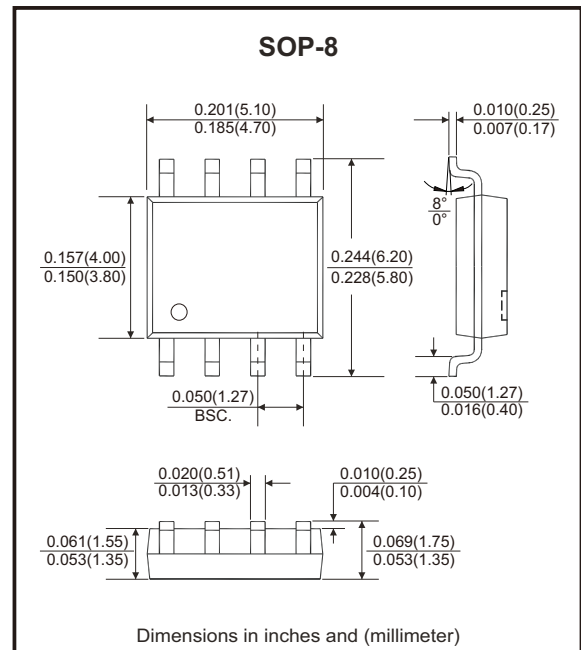
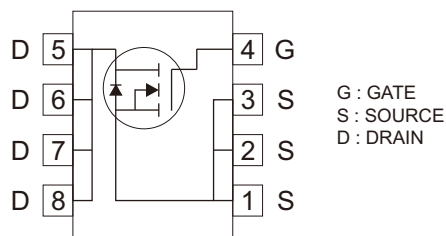
N-Channel
RoHS Device
Halogen Free



Features

- Single Drive Requirement.
- Low On-resistance.
- Fast Switching Characteristic.
- Dynamic dv/dt rating.
- Repetitive Avalanche Rated.

Circuit diagram



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

Parameter		Symbol	Value	Unit
Drain-source voltage		V _{DS}	30	V
Gate-source voltage		V _{GS}	±20	V
Continuous drain current	T _C = 25°C, V _{GS} = 10V	I _D	25	A
	T _C = 100°C, V _{GS} = 10V		16	
Pulsed drain current (Note 1)		I _{DM}	100	A
Avalanche Current		I _{AS}	20	A
Avalanche Energy @ L=0.1mH, I _D =20A, V _{DD} =15V		E _{AS}	40	mJ
Repetitive Avalanche Energy @ L=0.05mH (Note 2)		E _{AR}	0.3	mJ
Power dissipation	T _A = 25°C	P _D	2.5	W
	T _A = 100°C		1	
Thermal resistance from junction to ambient (Note 3)		R _{θJA}	50	°C/W
Thermal resistance from junction to case		R _{θJC}	25	°C/W
Junction temperature		T _J	-55 to +150	°C
Storage temperature		T _{STG}	-55 to +150	°C

Notes: 1. Pulse width limited by maximum junction temperature.

2. Duty cycle ≤ 1%.

3. Surface mounted on 1 in² copper pad of FR-4 board, 125°C/W when mounted on minimum copper pad.

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Electrical Characteristics (at $T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V$, $I_D=250\mu A$	30			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	1.0	1.6	2.5	V
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS}=30V$, $V_{GS}=0V$			1	μA
		$V_{DS}=30V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$			25	
Drain-source on-resistance (Note 1)	$R_{DS(on)}$	$V_{GS}=10V$, $I_D=18A$		3.5	4	m Ω
		$V_{GS}=4.5V$, $I_D=12A$		4.8	6	
Forward transconductance (Note 1)	G_{FS}	$V_{DS}=5V$, $I_D=18A$		32		S
Dynamic						
Input capacitance	C_{iss}	$V_{DS}=15V$, $V_{GS}=0V$ $f=1\text{MHz}$		2006		pF
Output capacitance	C_{oss}			362		
Reverse transfer capacitance	C_{rss}			221		
Turn-on delay time (Note 1 & 2)	$t_{d(ON)}$	$V_{DS}=15V$, $I_D=1A$ $V_{GS}=10V$, $R_G=2.7\Omega$		14.6		ns
Rise time (Note 1 & 2)	t_r			19.6		
Turn-off delay time (Note 1 & 2)	$t_{d(OFF)}$			59.2		
Fall time (Note 1 & 2)	t_f			14		
Total gate charge (Note 1 & 2)	Q_g	$V_{DS}=15V$, $I_D=18A$, $V_{GS}=10V$		41.6		nC
Total gate charge (Note 1 & 2)	Q_g	$V_{DS}=15V$, $I_D=18A$, $V_{GS}=4.5V$		21.5		
Gate-source charge (Note 1 & 2)	Q_{gs}	$V_{DS}=15V$, $I_D=18A$		6.4		
Gate-drain charge (Note 1 & 2)	Q_{gd}	$V_{GS}=10V$		9.2		
Gate resistance	R_g	$V_{DS}=0V$, $V_{GS}=15\text{mV}$, $f=1\text{MHz}$		2.5		Ω
Source-Drain Diode						
Forward diode voltage (Note 1)	V_{SD}	$I_F=I_S$, $V_{GS}=0V$			1.2	V
Continuous source-drain diode current	I_S	(Note 1)			10	A
Pulse diode forward current (Note 3)	I_{SM}				40	
Reverse recovery time	t_{rr}	$I_F=I_S$, $dI_F/dt=100A/\mu s$		16.2		ns
Reverse recovery charge	Q_{rr}			8		nC

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

2. Independent of operating temperature.

3. Pulse width limited by maximum junction temperature.

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TYPICAL RATING AND CHARACTERISTIC CURVES (CMS25N03Q8-HF)

Fig.1 - Typical Output Characteristics

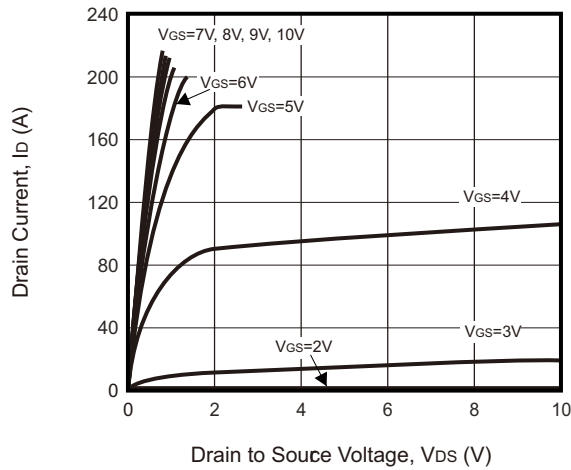


Fig.2 - Static Drain-Source On-State Resistance vs. Drain Current

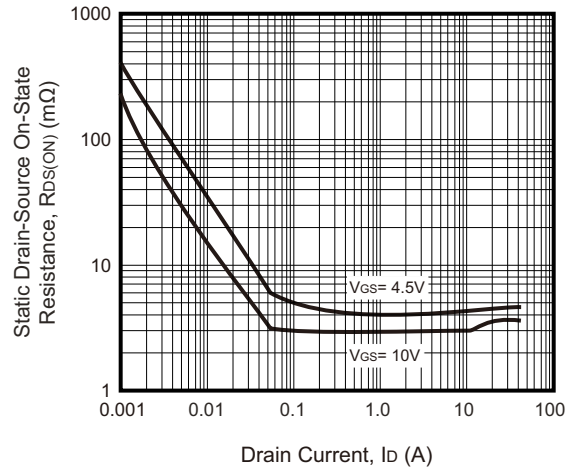


Fig.3 - Static Drain-Source On-State Resistance vs. Gate-Source Voltage

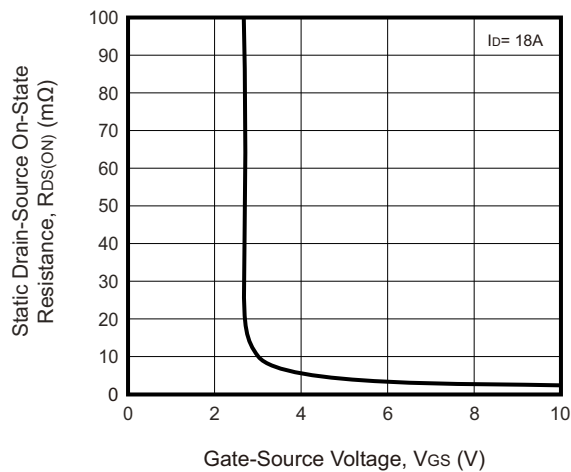


Fig.4 - Capacitance vs. Drain-Source Voltage

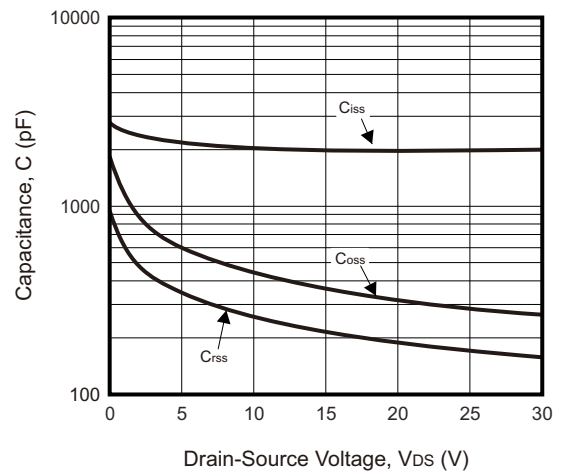


Fig.5 - Forward Transfer Admittance vs. Drain Current

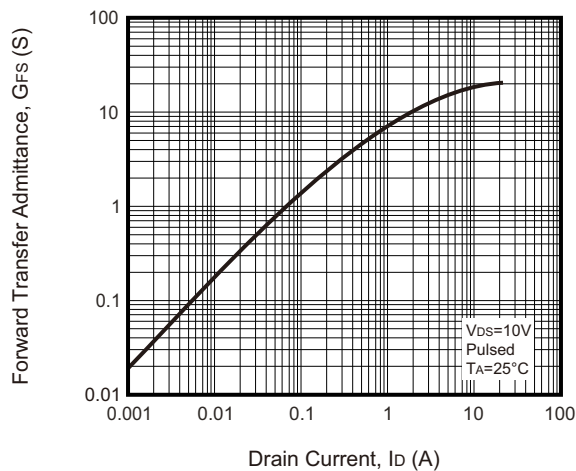
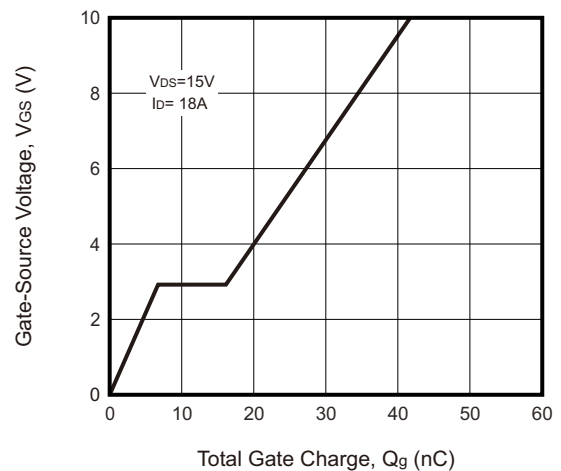
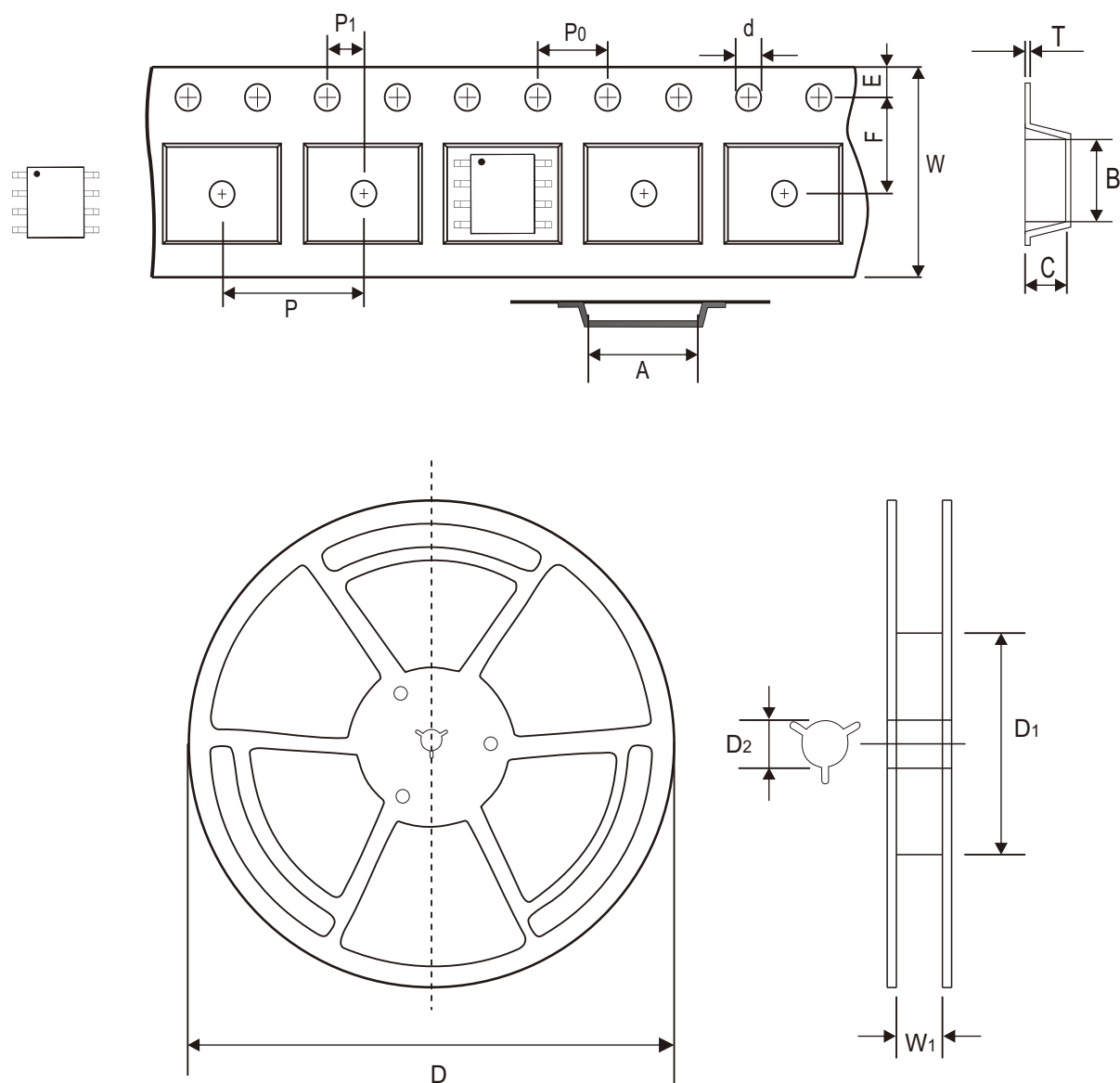


Fig.6 - Gate Charge Characteristics



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Reel Taping Specification



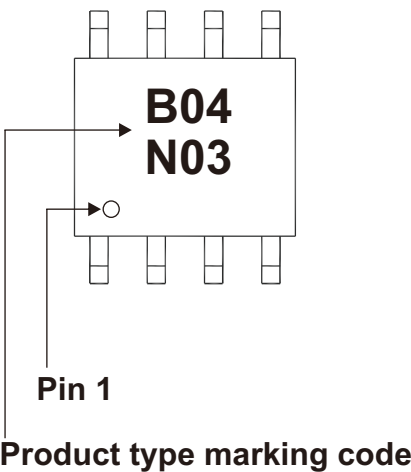
SOP-8	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.40 ± 0.10	5.20 ± 0.10	2.10 ± 0.10	1.50 + 0.10 - 0.00	330.00 ± 1.00	100.00 ± 0.50	13.00 ± 0.20
	(inch)	0.252 ± 0.004	0.205 ± 0.004	0.083 ± 0.004	0.059 + 0.004 - 0.000	12.992 ± 0.039	3.937 ± 0.020	0.512 ± 0.008

SOP-8	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	0.25 ± 0.02	12.00 + 0.30 - 0.10	17.60 + 1.00 - 0.00
	(inch)	0.069 ± 0.004	0.217 ± 0.002	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.010 ± 0.001	0.472 + 0.012 - 0.004	0.693 + 0.039 - 0.000

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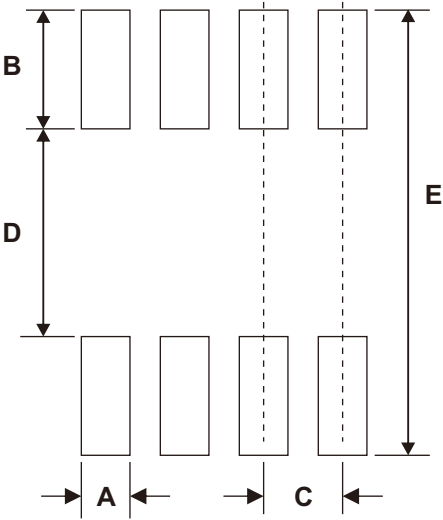
Marking Code

Part Number	Marking Code
CMS25N03Q8-HF	B04N03



Suggested P.C.B. PAD Layout

SIZE	SOP-8	
	(mm)	(inch)
A	0.60	0.024
B	1.52	0.060
C	1.27	0.050
D	4.00	0.157
E	7.00	0.275



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOP-8	4,000	13