

CMS10N03Q8-HF

N-Channel
RoHS Device
Halogen Free



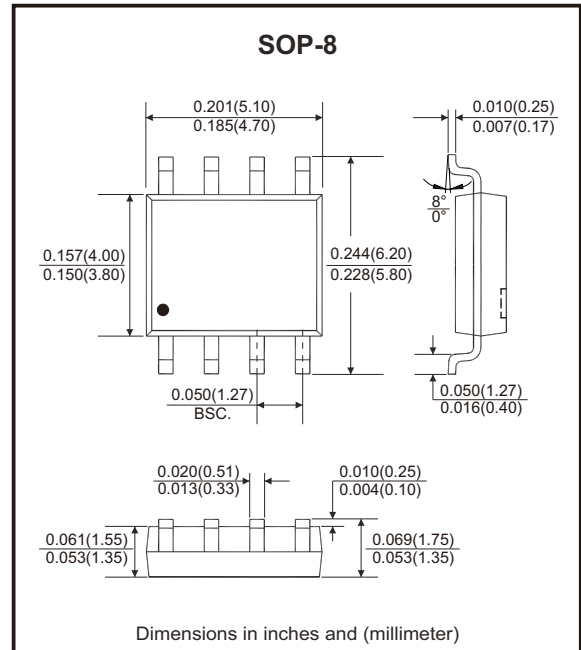
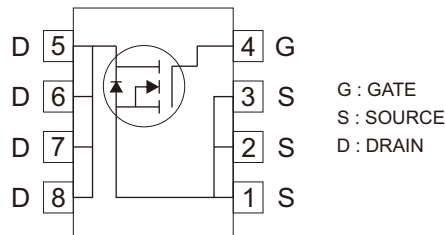
Features

- Single drive requirement.
- Low on-resistance.
- Fast switching characteristic.
- Dynamic dv/dt rating.
- Repetitive avalanche rated.

Mechanical data

- Case: SOP-8, molded plastic.
- Mounting position: Any.

Circuit Diagram



Maximum Ratings (at TC=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	I _D	T _A = 25°C, V _{GS} = 10V	10.2
		T _A = 100°C, V _{GS} = 10V	6.5
Pulsed drain current (Note 1)	I _{DM}	40	A
Avalanche current	I _{AS}	10	A
Avalanche energy @ L=0.1mH, I _D =10A, R _G =25Ω	E _{AS}	5	mJ
Repetitive avalanche energy @ L=0.05mH (Note 2)	E _{AR}	1.6	mJ
Power dissipation	P _D	T _A = 25°C	3.1
		T _A = 100°C	1.2
Thermal resistance from junction to ambient (Note 3)	R _{θJA}	40	°C/W
Thermal resistance from junction to case	R _{θJC}	25	°C/W
Operating junction temperature	T _J	-55 to +150	°C
Storage temperature range	T _{STG}	-55 to +150	°C

Notes: 1. Pulse width limited by maximum junction temperature.
 2. Duty cycle ≤ 1%.
 3. 40°C/W when mounted on a 1 in² pad of 2 oz copper, t ≤ 10s; 125°C/W when mounted on minimum pad.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V , I _D =250μA	30			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.7	3.0	V
Gate-source leakage	I _{GSS}	V _{GS} =±20V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} =24V , V _{GS} =0V			1	μA
		V _{DS} =20V , V _{GS} =0V , T _J =125°C			25	
Static Drain-source on-state resistance (Note 1)	R _{DS(ON)}	V _{GS} =10V , I _D =9A		13.6	18	mΩ
		V _{GS} =4.5V , I _D =7A		22.3	29	
Forward transconductance	G _{FS}	V _{DS} =5V , I _D =8A		9		S
Dynamic						
Input capacitance	C _{iss}	V _{DS} =15V , V _{GS} =0V f=1MHz		715		pF
Output capacitance	C _{oss}			76		
Reverse transfer capacitance	C _{rss}			66		
Turn-on delay time (Note 1 & 2)	t _{d(ON)}	V _{DS} =15V , I _D =1A V _{GS} =10V , R _G =6Ω		7.5		ns
Rise time (Note 1 & 2)	t _r			12		
Turn-off delay time (Note 1 & 2)	t _{d(OFF)}			21		
Fall time (Note 1 & 2)	t _f			7		
Total gate charge (Note 1 & 2)	Q _g	V _{DS} =15V , I _D =9A , V _{GS} =10V		11		nC
Total gate charge (Note 1 & 2)	Q _g	V _{DS} =15V , I _D =9A , V _{GS} =5V		6.4		
Gate-source charge (Note 1 & 2)	Q _{gs}	V _{DS} =15V , I _D =9A , V _{GS} =10V		1.9		
Gate-drain charge (Note 1 & 2)	Q _{gd}			3		
Gate resistance	R _g	V _{DS} =0V , V _{GS} =15mV , f=1MHz		2.2		
Source-Drain Diode						
Continuous source-drain diode current (Note 1)	I _S				2.3	A
Pulse diode forward current (Note 3)	I _{SM}				9.2	
Diode forward voltage (Note 1)	V _{SD}	I _F =2.3A , V _{GS} =0V		0.78	1.2	V
Reverse recovery time	t _{rr}	I _F =2.3A , dI _F /dt=100A/μs		50		ns
Recovered charge	Q _{rr}				2	

Note: 1. Pulse Test: Pulse width ≤ 300μs, duty cycle ≤ 2%.
 2. Independent of operating temperature.
 3. Pulse width limited by maximum junction temperature.

Typical Rating and Characteristic Curves (CMS10N03Q8-HF)

Fig.1 - Typical Output Characteristics

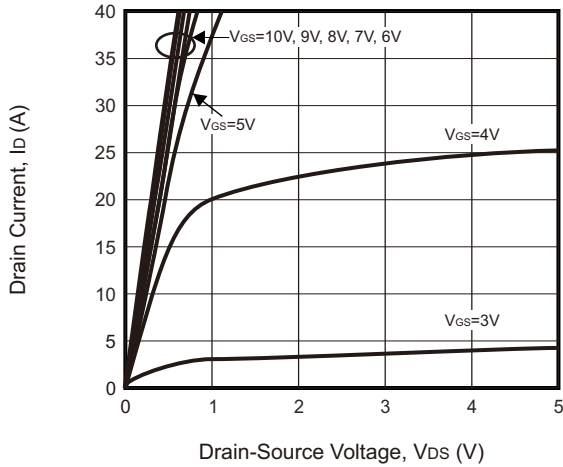


Fig.2 - Static Drain-Source On-State Resistance vs. Drain Current

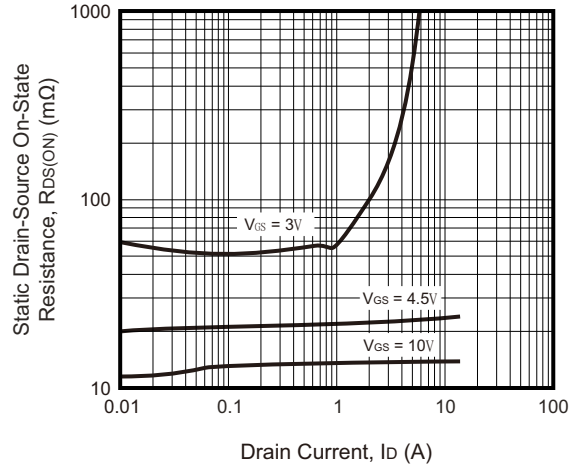


Fig.3 - Static Drain-Source On-State Resistance vs. Gate-Source Voltage

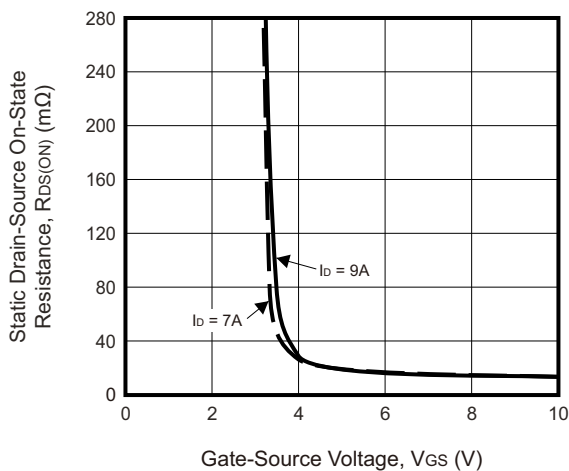


Fig.4 - Capacitance vs. Drain-Source Voltage

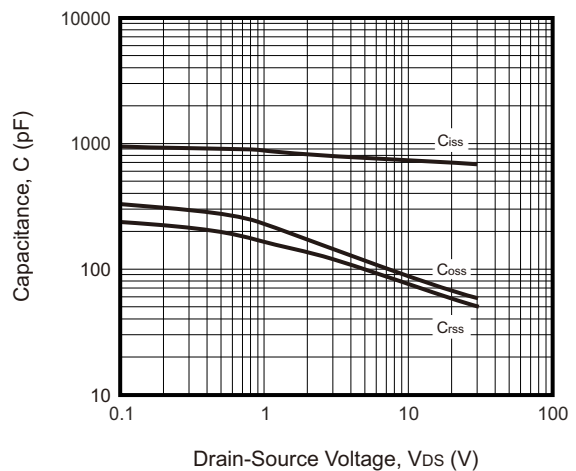


Fig.5 - Forward Transfer Admittance vs. Drain Current

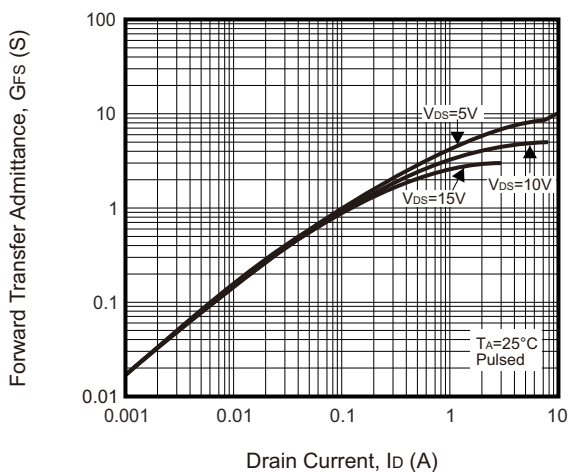
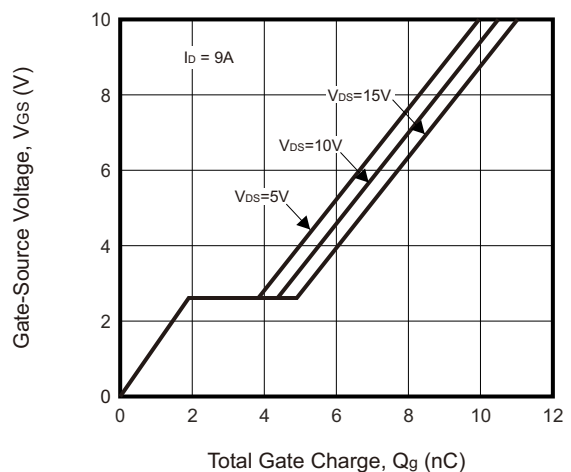
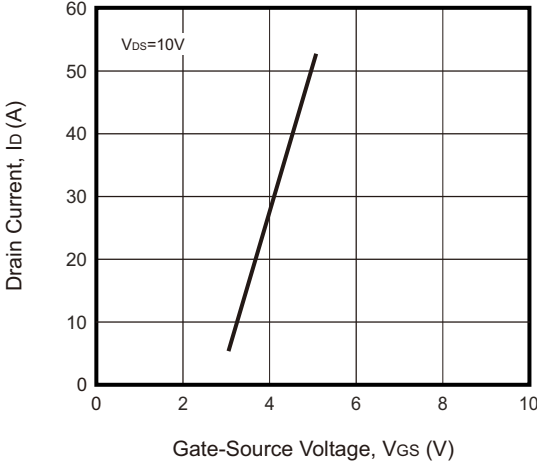


Fig.6 - Gate Charge Characteristics

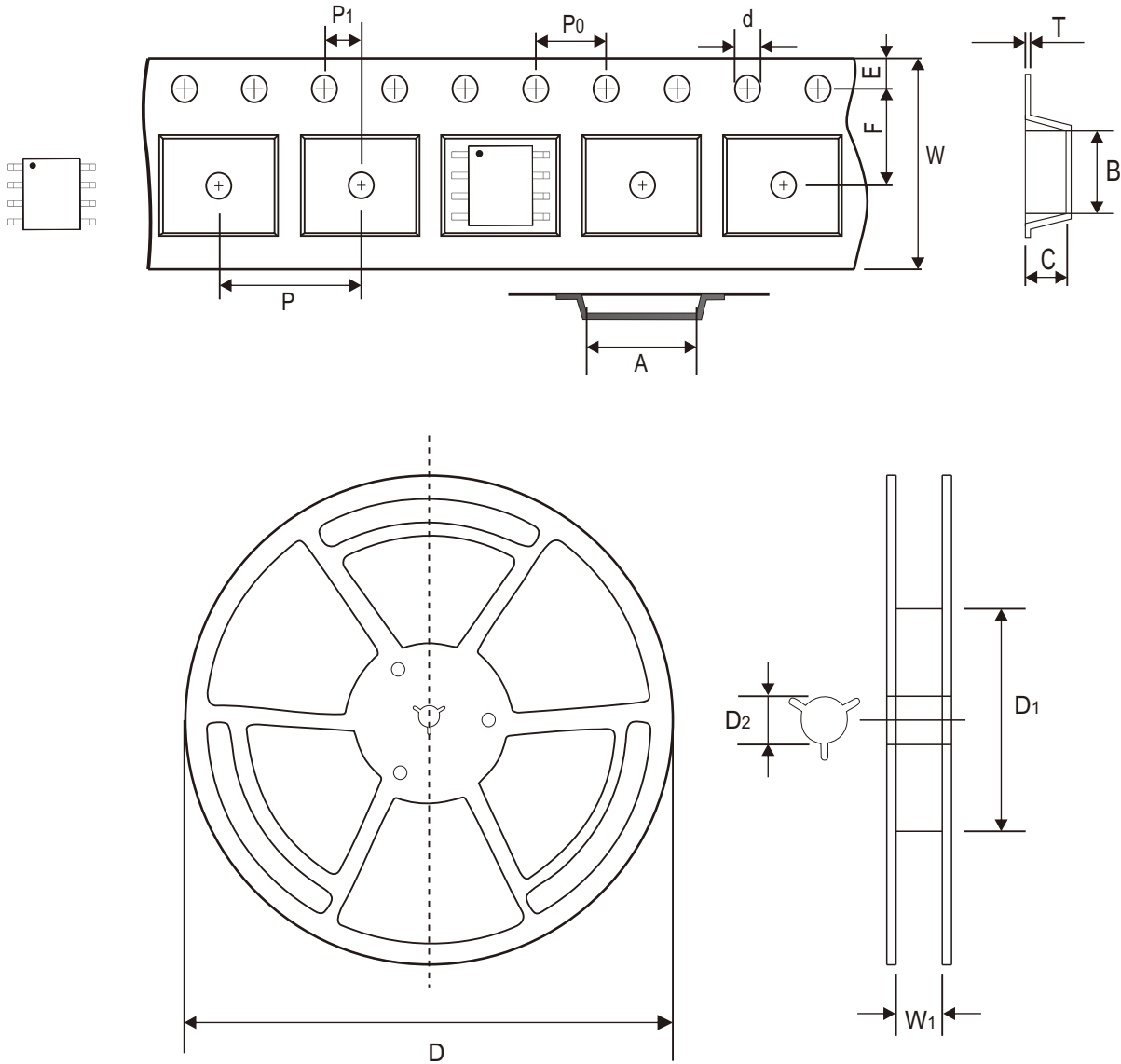


Typical Rating and Characteristic Curves (CMS10N03Q8-HF)

Fig.7 - Typical Transfer Characteristics



Reel Taping Specification

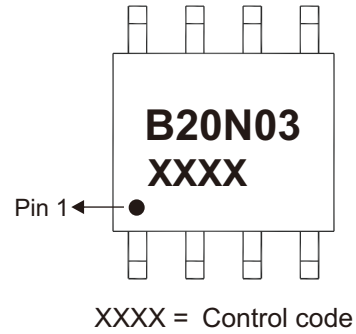


SOP-8	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.40 ± 0.10	5.20 ± 0.10	2.10 ± 0.10	1.50 + 0.10 - 0.00	330.00 ± 1.00	100.00 ± 0.50	13.00 ± 0.20
	(inch)	0.252 ± 0.004	0.205 ± 0.004	0.083 ± 0.004	0.059 + 0.004 - 0.000	12.992 ± 0.039	3.937 ± 0.020	0.512 ± 0.008

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

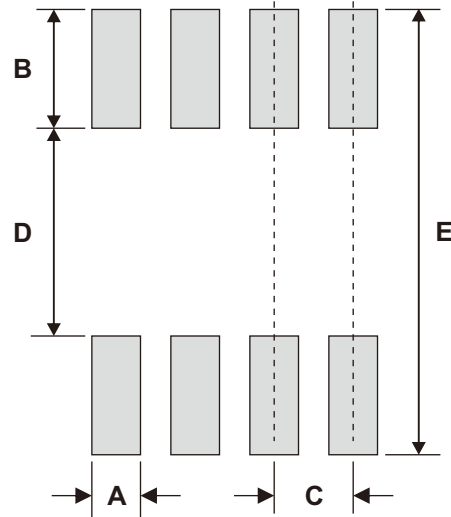
Marking Code

Part Number	Marking Code
CMS10N03Q8-HF	B20N03



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