

CMS15P03Q8A-HF

P-Channel
RoHS Device
Halogen Free



Features

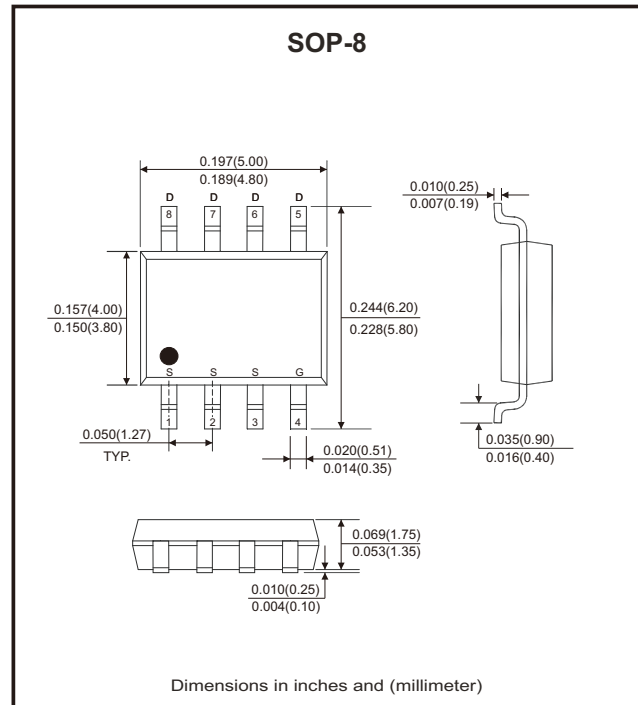
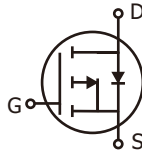
- Low on-resistance.
- Low miller charge.
- Low input capacitance.
- Green device available.
- 100% EAS guaranteed.

Mechanical data

- Case: SOP-8 standard package, molded plastic.

Circuit Diagram

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



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

Parameter	Conditions	Symbol	Value	Unit
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current (Note 1)	$I_D @ T_C = 25^\circ C$		-15	A
	$I_D @ T_C = 70^\circ C$		-12	
Pulsed drain current (Note 2)		I_{DM}	-31	A
Continuous drain current	$I_D @ T_A = 25^\circ C$		-8.6	A
	$I_D @ T_A = 70^\circ C$		-6.9	
Total power dissipation	$P_D @ T_C = 25^\circ C$		4.5	W
	$P_D @ T_A = 25^\circ C$		1.5	
Single pulse avalanche energy, L=0.1mH (Note 3)		E_{AS}	105	mJ
Single pulse avalanche current, L=0.1mH (Note 3)		I_{AS}	-46	A
Operating junction temperature range		T_J	-55 to +150	°C
Storage temperature range		T_{STG}	-55 to +150	°C
Thermal resistance junction-ambient (Note 2)	Steady state	$R_{\theta JA}$	85	°C/W
Thermal resistance junction-case (Note 2)	Steady state	$R_{\theta JC}$	28	°C/W

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-30			V
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.65	-2.5	
Forward transconductance	g _{fs}	V _{DS} = -5V, I _D = -10A		24		S
Gate-source leakage current	I _{GSS}	V _{GS} = ±20V			±100	nA
Drain-source leakage current (T _J =25°C)	I _{DSS}	V _{DS} = -24V, V _{GS} = 0V			-1	μA
Static drain-source on-resistance (Note 2)	R _{DS(on)}	V _{GS} = -10V, I _D = -12A		10	12	mΩ
		V _{GS} = -4.5V, I _D = -8A		16	20	
Total gate charge (Note 2)	Q _g	V _{DS} = -15V, I _D = -12A, V _{GS} = -4.5V		21.5		nC
Gate-source charge	Q _{gs}			8.5		
Gate-drain ("miller") charge	Q _{gd}			7		
Turn-on delay time (Note 2)	t _{d(on)}	V _{DS} = -15V, V _{GS} = -10V I _D = -1A, R _G = 3.3Ω		7.84		nS
Rise time	t _r			72.2		
Turn-off delay time	t _{d(off)}			60.5		
Fall time	t _f			23.9		
Input capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -15V, f = 1MHz		2129		pF
Output capacitance	C _{oss}			298		
Reverse transfer capacitance	C _{rss}			227		
Gate resistance	R _g	f = 1MHz		9		Ω
Source-drain diode						
Diode forward voltage	V _{SD}	I _S = -1A, V _{GS} = 0V, T _J =25°C			-1.0	V
Continuous source current (Note 2,4)	I _S	V _G = V _D = 0V, Force current			-15	A
Pulsed source current (Note 2,4)	I _{SM}				-31	A
Reverse recovery time	t _{rr}	I _F = -6A , T _J =25°C		16.3		nS
Reverse recovery charge	Q _{rr}	dI/dt = 100A/μs		5.9		nC
Guaranteed avalanche characteristics						
Single pulse avalanche energy (Note 3)	EAS	V _{DD} = -25V, L=0.1mH, I _{AS} = -33A	54			mJ

Notes: 1. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.

3. The min. value is 100% EAS tested guarantee.

4. The data is theoretically the same as I_D and IDM , in real applications, should be limited by total power dissipation.

Rating and Characteristic Curves (CMS15P03Q8A-HF)

Fig.1 - Typical Output Characteristics

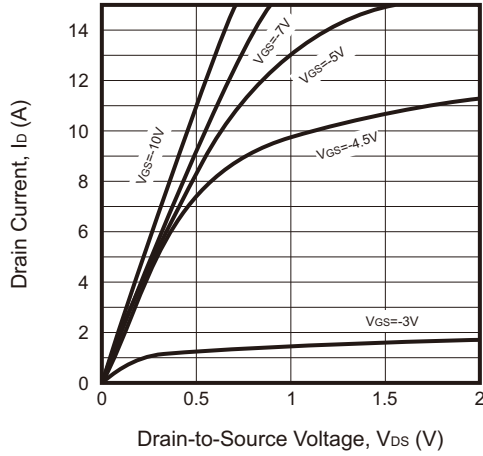


Fig.2 - On-Resistance vs. G-S Voltage

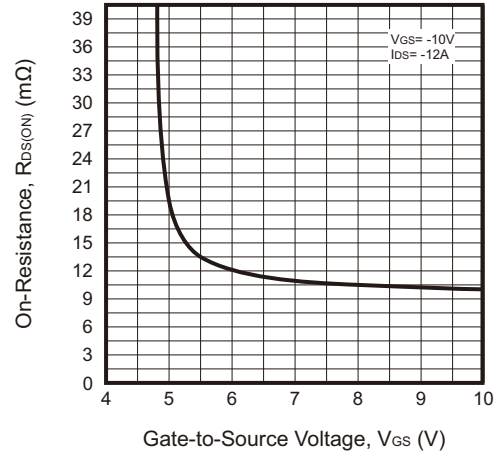


Fig.3 - On-Resistance vs. Drain Current

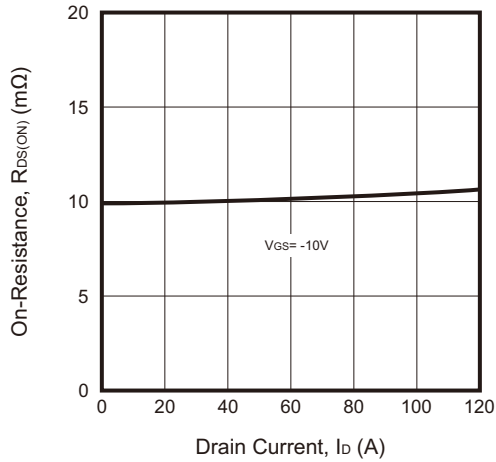


Fig.4 - Normalized $R_{DS(ON)}$ vs. T_J

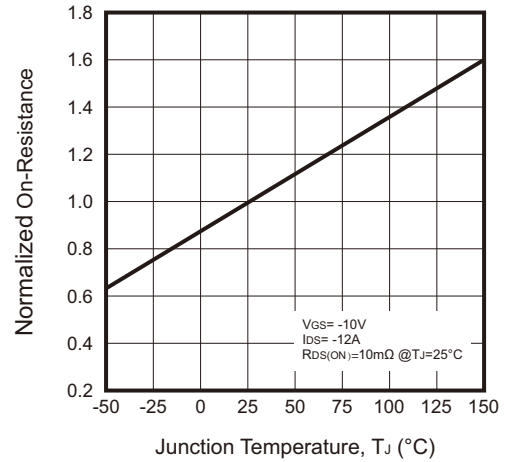


Fig.5 - Normalized $V_{GS(th)}$ vs. T_J

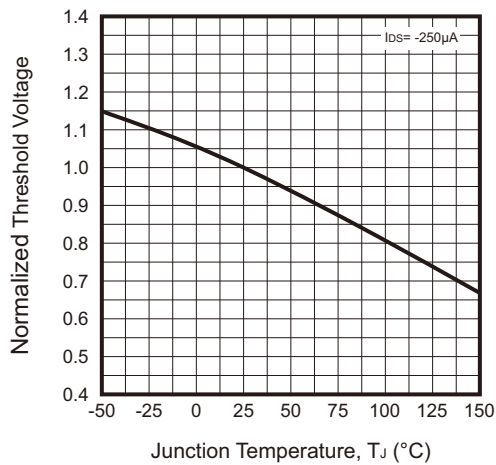
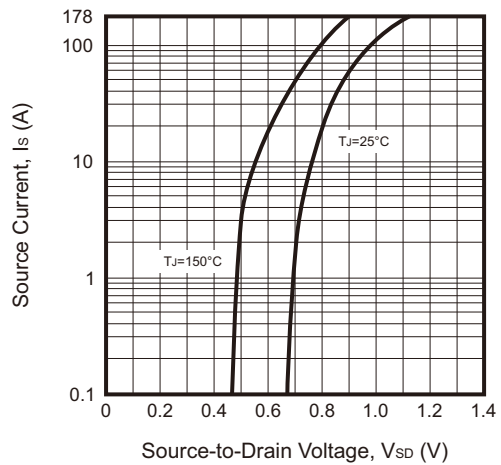


Fig.6 - Forward Characteristics of Reverse



Rating and Characteristic Curves (CMS15P03Q8A-HF)

Fig.7 - Gate Charge Characteristics

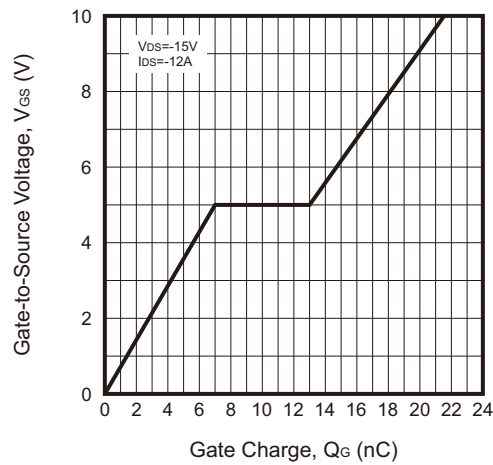


Fig.8 - Capacitance Characteristics

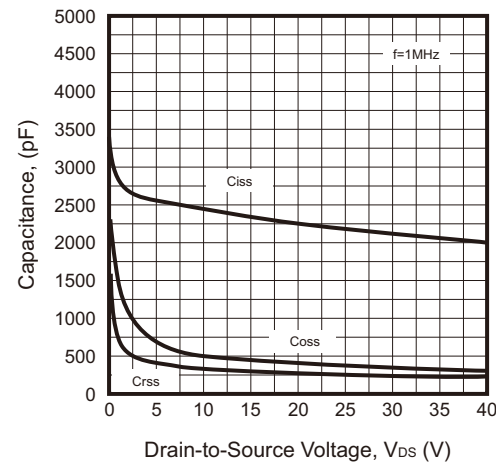


Fig.9 - Safe Operating Area

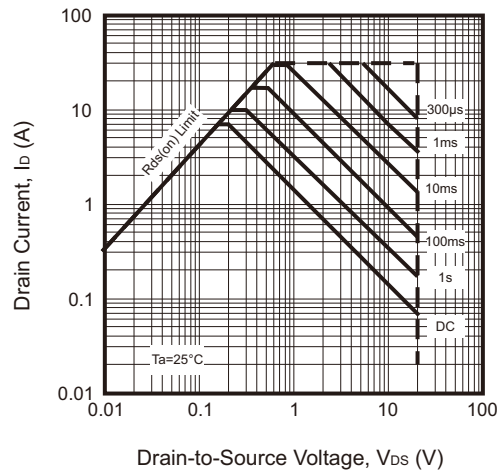


Fig.10 - Power Dissipation

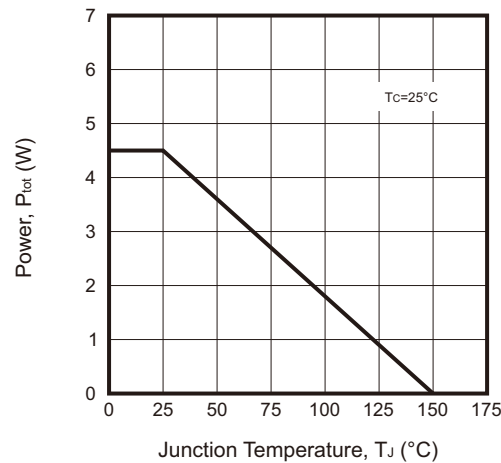
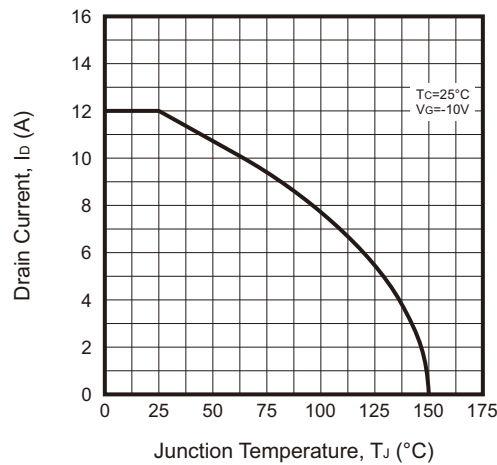
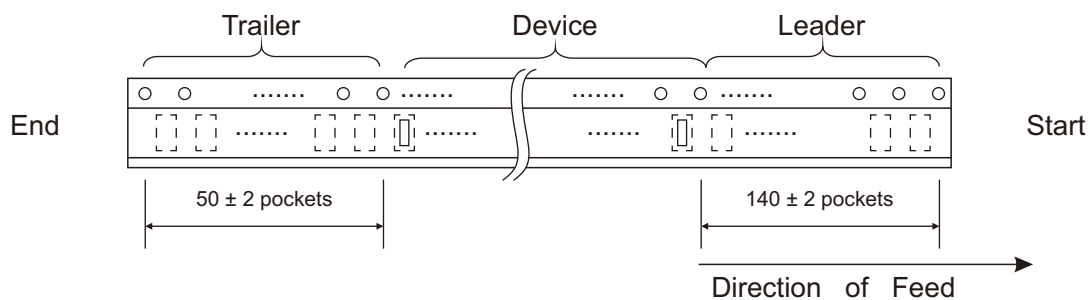
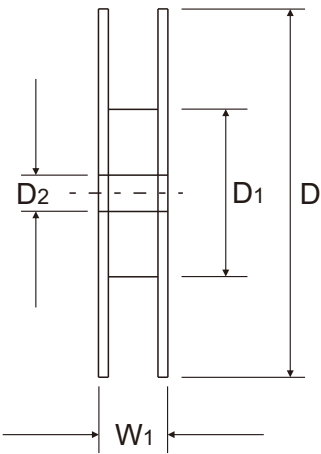
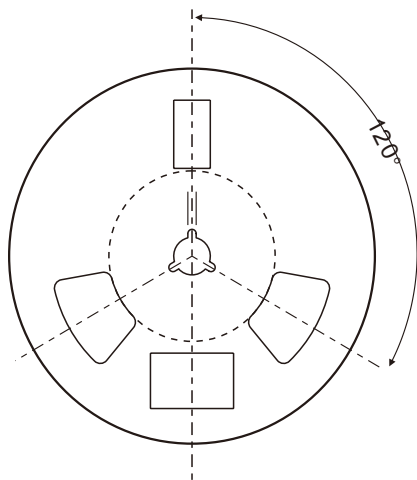
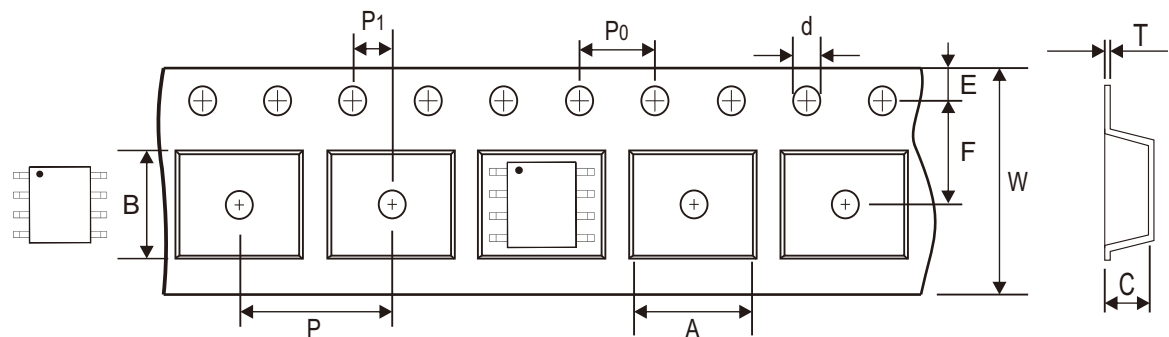


Fig.11 - Drain Current vs. T_J



Reel Taping Specification

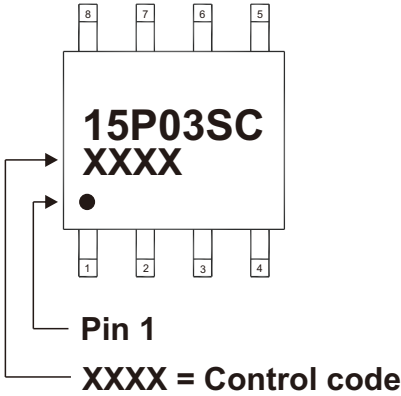


SOP-8	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	6.50 ± 0.10	5.30 ± 0.10	2.10 ± 0.10	1.50 + 0.10 - 0.00	330.00 ± 1.00	178.00 + 0.00 - 2.00	13.00 min.
	(inch)	0.256 ± 0.004	0.209 ± 0.004	0.083 ± 0.004	0.059 + 0.004 - 0.000	12.992 ± 0.039	7.008 + 0.000 - 0.079	0.512 min.

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	0.30 ± 0.05	12.00 ± 0.30	18.40 ref.
	(inch)	0.069 ± 0.004	0.217 ± 0.002	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.012 ± 0.002	0.472 ± 0.012	0.724 ref.

Marking Code

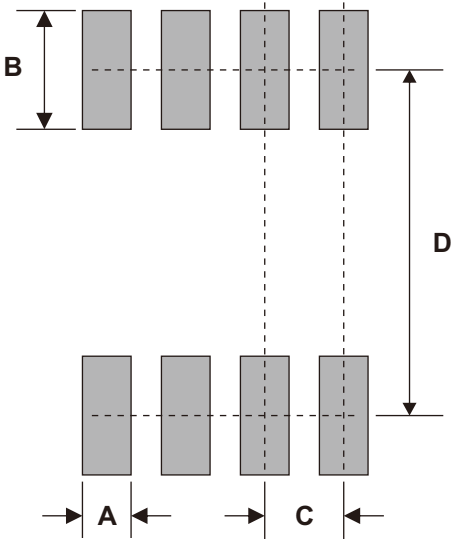
Part Number	Marking Code
CMS15P03Q8A-HF	15P03SC



Suggested PAD Layout

SIZE	SOP-8	
	(mm)	(inch)
A	0.65	0.026
B	1.75	0.069
C	1.27	0.050
D	5.60	0.220

Note: 1. The pad layout is for reference purposes only.



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOP-8	3000	13