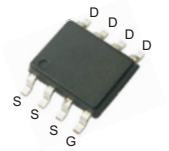
CMS11P04Q8-HF

P-Channel
RoHS Device
Halogen Free



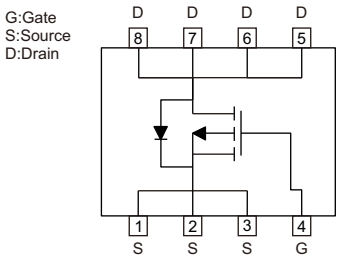
Features

- Single drive requirement.
- Low on resistance.
- Fast switching characteristic.

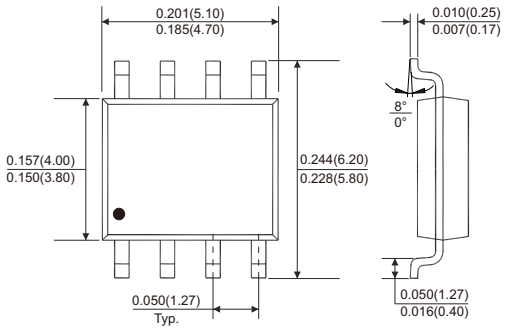
Mechanical data

- Case: SOP-8, molded plastic.
- Terminal: Tin plated, solderable per MIL-STD-750, method 2026.
- Mounting position: Any.

Circuit Diagram



SOP-8



Dimensions in inches and (millimeter)

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

Parameter	Conditions	Symbol	Value	Unit
Drain-source voltage		V_{DS}	-40	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current (Note 1)	V_{GS} = -10V, T_C = 25°C	I_D	-11	A
	V_{GS} = -10V, T_C = 100°C	I_D	-7	
Continuous drain current (Note 2)	V_{GS} = -10V, T_A = 25°C	I_D	-4.8	
	V_{GS} = -10V, T_A = 70°C	I_D	-3.8	
Pulsed drain current (Note 3)		I_{DM}	-44	A
Continuous body diode forward current @T_C = 25°C (Note 1)		I_S	-8	A
Pulsed body diode forward current @T_C = 25°C (Note 1)		I_{SM}	-32	A
Avalanche current @L=0.1mH		I_{AS}	-15	A
Avalanche energy @L=0.5mH		E_{AS}	16	mJ
Total power dissipation (Note 1)	T_C = 25°C	P_D	10	W
	T_C = 100°C	P_D	4	
Total power dissipation (Note 2)	T_A = 25°C	P_D	1.9	
	T_A = 70°C	P_D	1.2	
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +150	°C

Thermal Data

Parameter	Symbol	Steady state	Unit
Thermal resistance, junction to case	$R_{\theta JC}$	12	°C/W
Thermal resistance, junction to ambient (Note 2)	$R_{\theta JA}$	65	°C/W

Notes: 1. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

2. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Rating are based on low frequency and low duty cycles to keep initial T_J=25°C.

Electrical Characteristics (at T_A=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	-40			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1		-2.5	V
Forward transconductance	g_{fs}	V_{DS} = -10V, I_D = -5A		8.6		S
Gate-source leakage current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
Drain-source leakage current	I_{DSS}	V_{DS} = -32V, V_{GS} = 0V			-1	μA
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -6A		35	45	mΩ
		V_{GS} = -4.5V, I_D = -5A		45	63	mΩ
Dynamic						
Input capacitance	C_{iss}	V_{DS} = -20V, V_{GS} = 0V, f = 1MHz		930		pF
Output capacitance	C_{oss}			80		
Reverse transfer capacitance	C_{rss}			60		
Gate resistance	R_g	f = 1MHz		22		Ω
Total gate charge (Note 1,2)	Q_g	V_{DS} = -20V, I_D = -6A, V_{GS} = -4.5V		9.3		nC
Total gate charge (Note 1,2)	Q_g	V_{DS} = -20V, I_D = -6A, V_{GS} = -10V		19		
Gate-source charge (Note 1,2)	Q_{gs}			2.8		
Gate-drain charge (Note 1,2)	Q_{gd}			3.5		
Turn-on delay time (Note 1,2)	$t_{d(on)}$	V_{DS} = -20V, I_D = -6A, V_{GS} = -10V, R_{GS} = 1Ω		6.8		nS
Rise time (Note 1,2)	t_r			19		
Turn-off delay time (Note 1,2)	$t_{d(off)}$			66		
Fall time (Note 1,2)	t_f			32		
Source-drain diode						
Diode forward voltage (Note 1)	V_{SD}	I_S = -6A, V_{GS} = 0V		-0.85	-1.2	V
Reverse recovery time	t_{rr}	I_F = -6A, dI_F/dt = 100A/μs		9.6		nS
Reverse recovery charge	Q_{rr}			5		nC

Notes: 1. Pulse width ≤ 300μs, duty cycle ≤ 2%.
2. Independent of operating temperature.

Typical Rating and Characteristic Curves (CMS11P04Q8-HF)

Fig.1 - Typical Output Characteristics

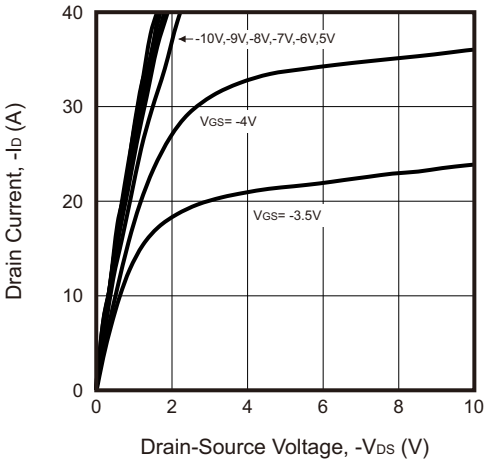


Fig.2 - Breakdown Voltage vs Ambient Temperature

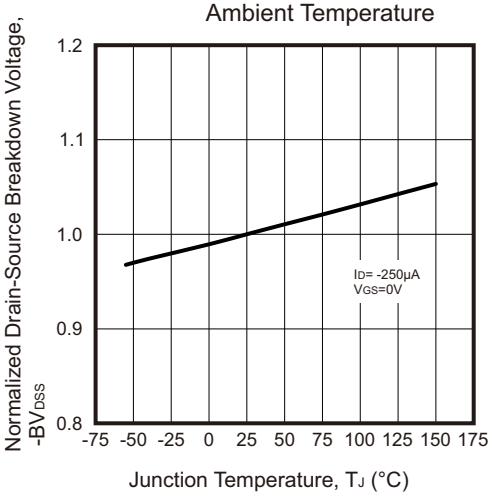


Fig.3 - Static Drain-Source On-State Resistance vs Drain Current

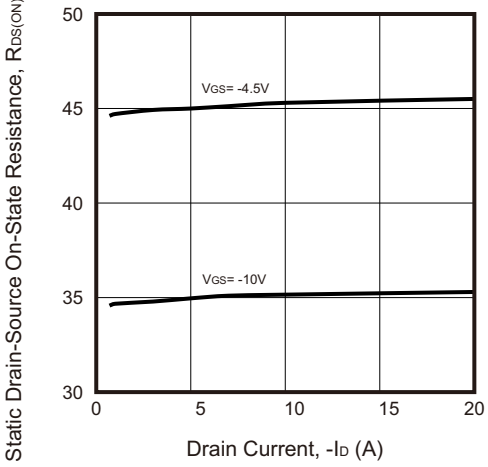


Fig.4 - Body Diode Current vs Source-Drain Voltage

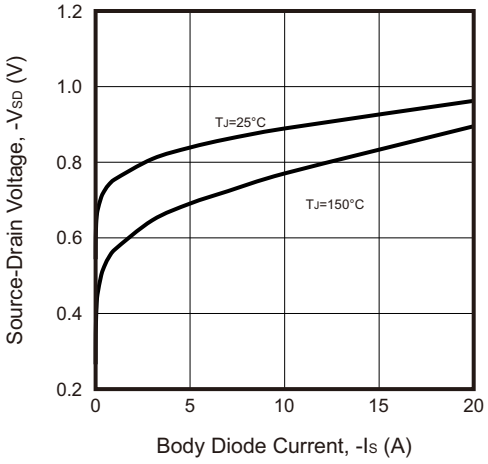


Fig.5 - Static Drain-Source On-State Resistance vs Gate-Source Voltage

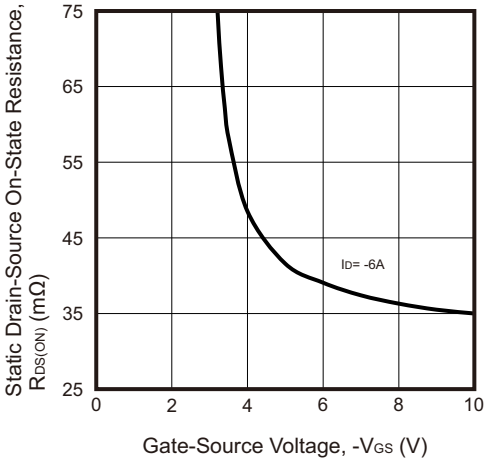
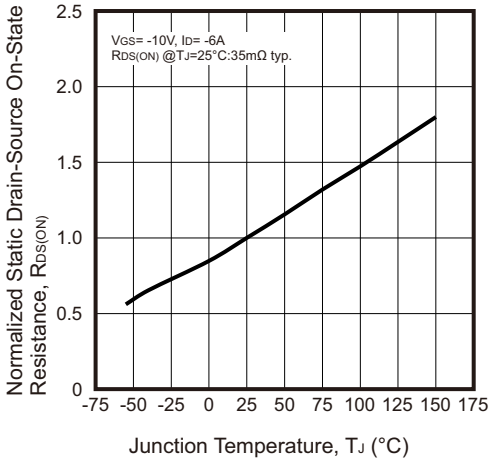


Fig.6 - Drain-Source On-State Resistance vs Junction Temperature



Typical Rating and Characteristic Curves (CMS11P04Q8-HF)

Fig.7 - Capacitance vs Drain-to-Source Voltage

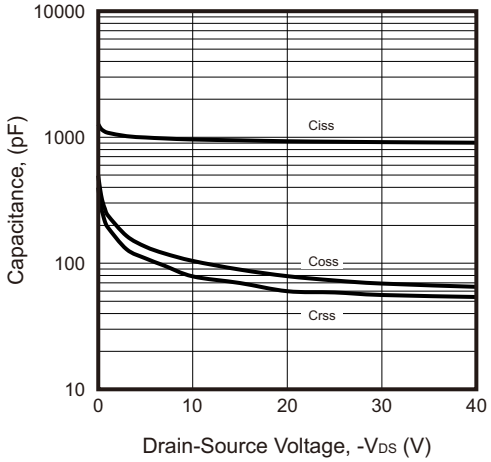


Fig.8 - Threshold Voltage vs Junction Temperature

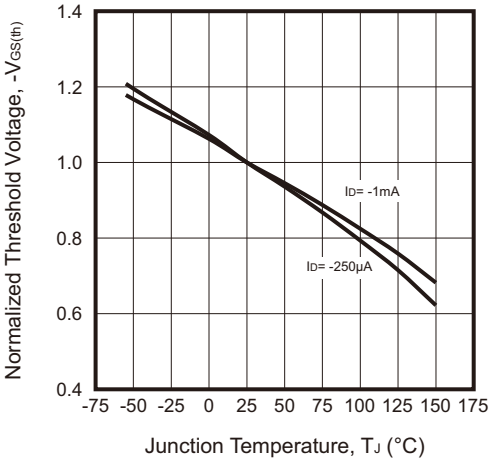


Fig.9 - Forward Transfer Admittance vs Drain Current

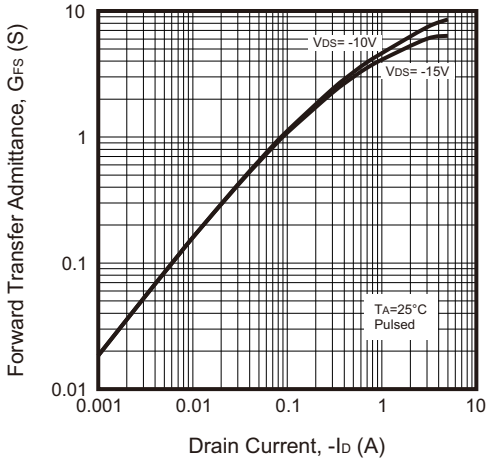


Fig.10 - Gate Charge Characteristics

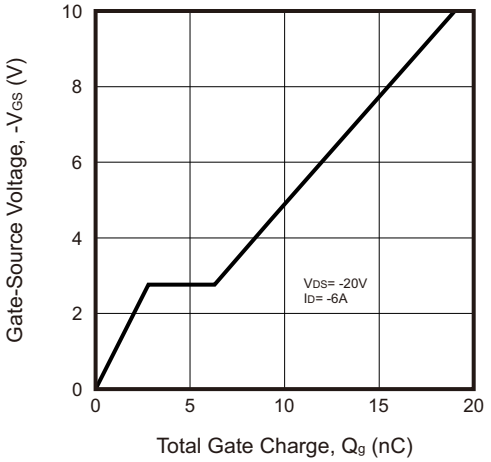


Fig.11 - Maximum Safe Operating Area

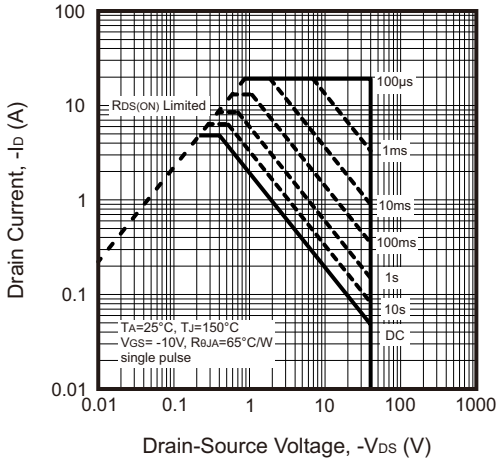
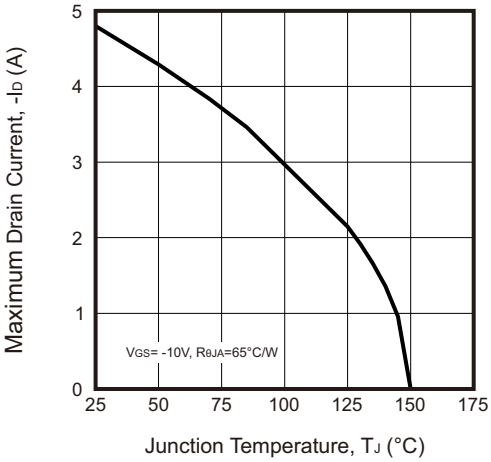
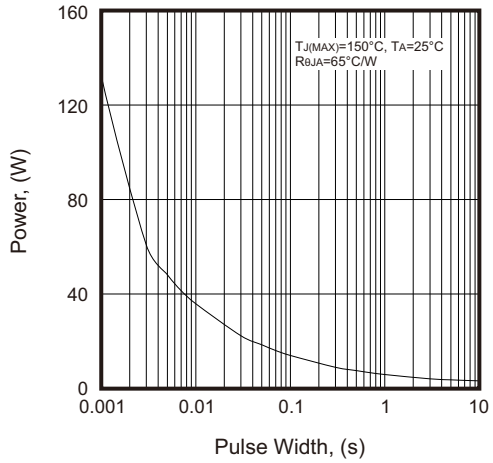


Fig.12 - Maximum Drain Current vs Junction Temperature

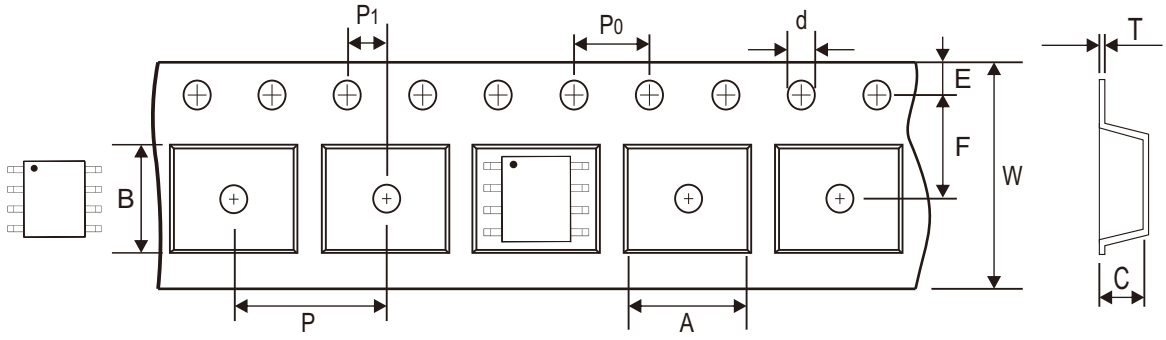


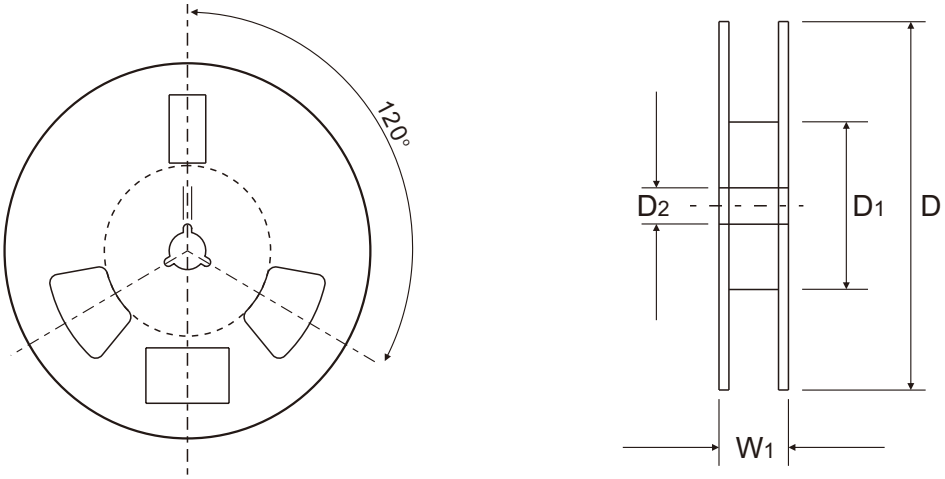
Typical Rating and Characteristic Curves (CMS11P04Q8-HF)

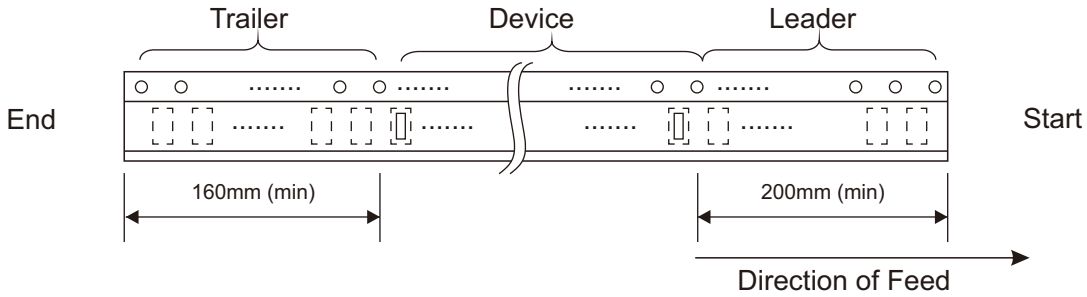
Fig.13 - Single Pulse Power Rating, Junction to Ambient



Reel Taping Specification





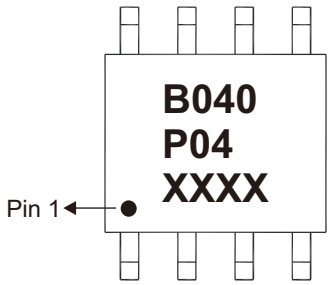


	SYMBOL	A	B	C	d	D	D_1	D_2
SOP-8	(mm)	6.40 ± 0.10	5.20 ± 0.10	2.10 ± 0.10	1.55 ± 0.05	330.00 ± 1.00	100.00 ± 0.50	13.00 ± 0.20
	(inch)	0.252 ± 0.004	0.205 ± 0.004	0.083 ± 0.004	0.061 ± 0.002	12.992 ± 0.039	3.937 ± 0.020	0.512 ± 0.008

	SYMBOL	E	F	P	P_0	P_1	T	W	W_1
SOP-8	(mm)	1.75 ± 0.10	5.50 ± 0.05	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.292 ± 0.013	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	0.011 ± 0.001	0.472 + 0.012 − 0.004	0.693 + 0.039 − 0.000

Marking Code

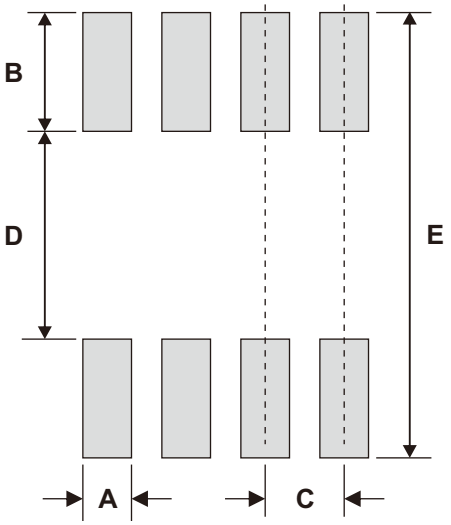
Part Number	Marking Code
CMS11P04Q8-HF	B040P04



XXXX = Control code

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	0.276



Standard Packaging

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