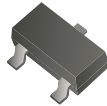


CMSN2304A-HF

N-Channel
RoHS Device
Halogen Free



Features

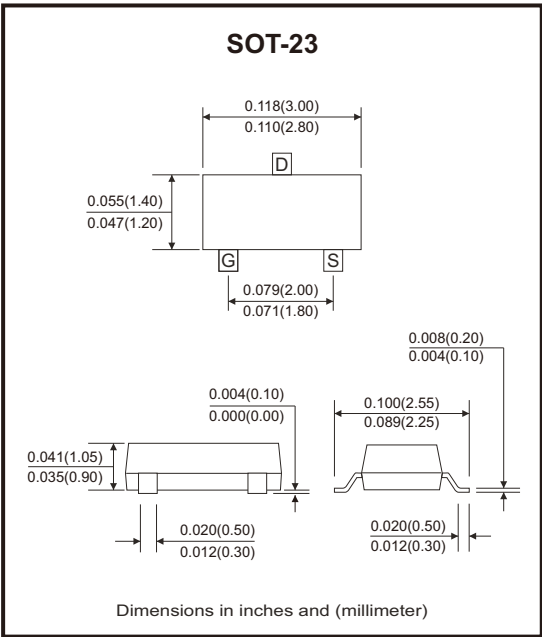
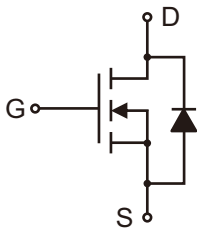
- High power and current handling capability.

Mechanical data

- Case: SOT-23, molded plastic.
- Mounting position: Any.

Circuit Diagram

G : GATE
S : SOURCE
D : DRAIN



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
Drain current	I_D	3.6	A
		2.9	
Pulsed drain current (Note 1)	I_{DM}	15	A
Total power dissipation	P_D	1	W
		0.6	
Thermal resistance junction to ambient (Note 2)	$R_{\theta JA}$	125	°C/W
Junction and storage temperature range	T_J, T_{STG}	-55 to +150	°C

Notes: 1. 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 $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in² pad 2oz copper.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Parameters						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.5	2.2	V
Static drain-source on-resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 3.6A		26	33	mΩ
		V _{GS} = 4.5V, I _D = 3A		39	48	
Diode forward voltage	V _{SD}	I _S = 3.6A, V _{GS} = 0V			1.2	V
Dynamic Parameters						
Input capacitance	C _{iss}	V _{DS} = 10V, V _{GS} = 0V, f = 1MHz		314		pF
Output capacitance	C _{oss}			59		
Reverse transfer capacitance	C _{rss}			48		
Switching Parameters						
Total gate charge	Q _g	V _{GS} = 10V, V _{DS} = 15V, I _D = 3.6A		6.08		nC
Gate source charge	Q _{gs}			1.26		
Gate drain charge	Q _{gd}			1.32		
Reverse recovery charge	Q _{rr}	I _F = 3.6A, di/dt = 100A/μs		1.66		
Reverse recovery time	t _{rr}			17.33		
Turn-on delay time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 15V, R _L = 4.1Ω, R _{GEN} = 3Ω		3.8		ns
Turn-on rise time	t _r			23.2		
Turn-off delay time	t _{d(off)}			7		
Turn-off fall time	t _f			18.6		

Typical Rating and Characteristic Curves (CMSN2304A-HF)

Fig.1 - Output Characteristics

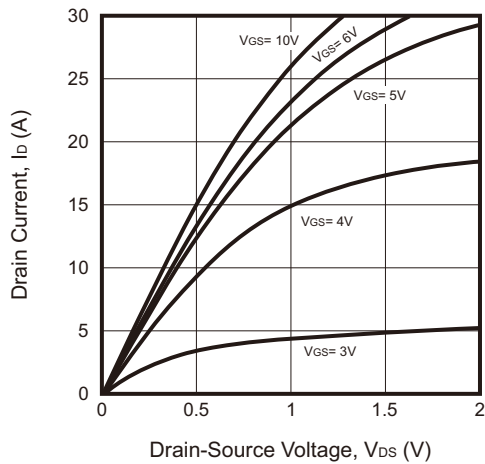


Fig.2 - Transfer Characteristics

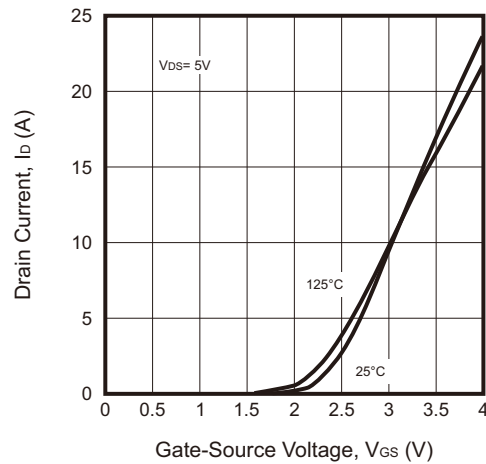


Fig.3 - On-Resistance vs. Drain Current and Gate Voltage

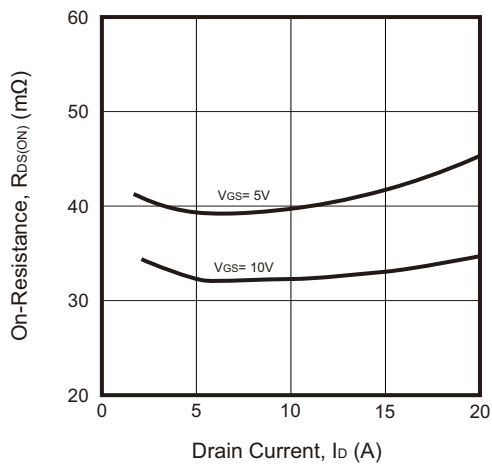


Fig.4 - On-Resistance vs. Junction Temperature

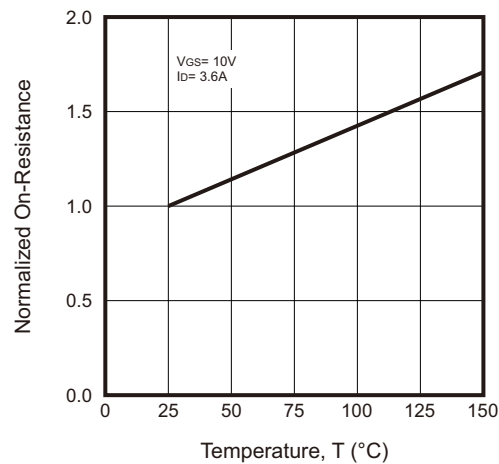


Fig.5 - Capacitance Characteristics

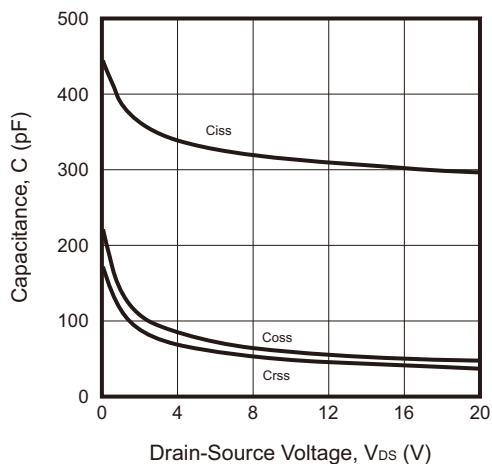
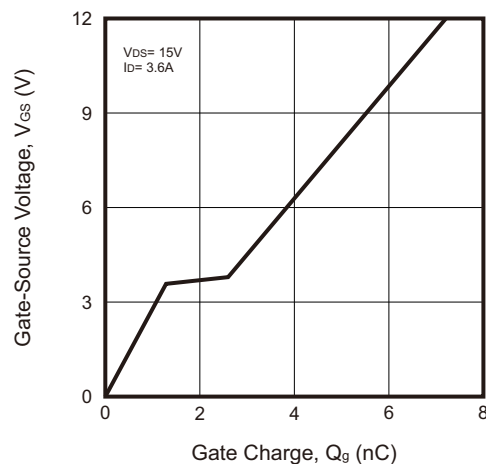


Fig.6 - Gate Charge



Typical Rating and Characteristic Curves (CMSN2304A-HF)

Fig.7 - Safe Operation Area

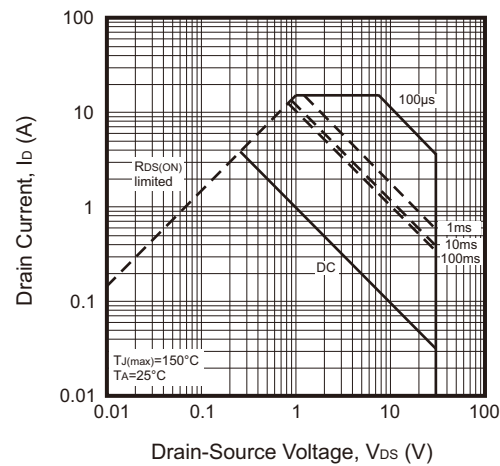
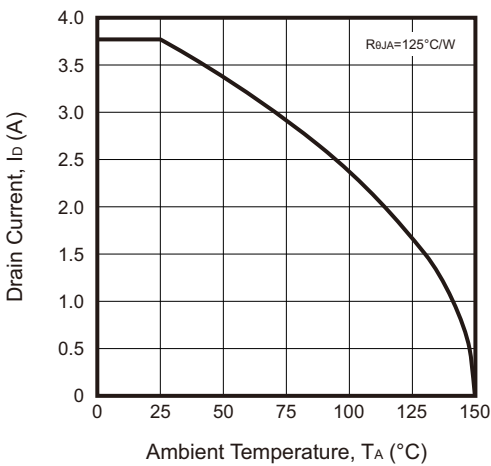
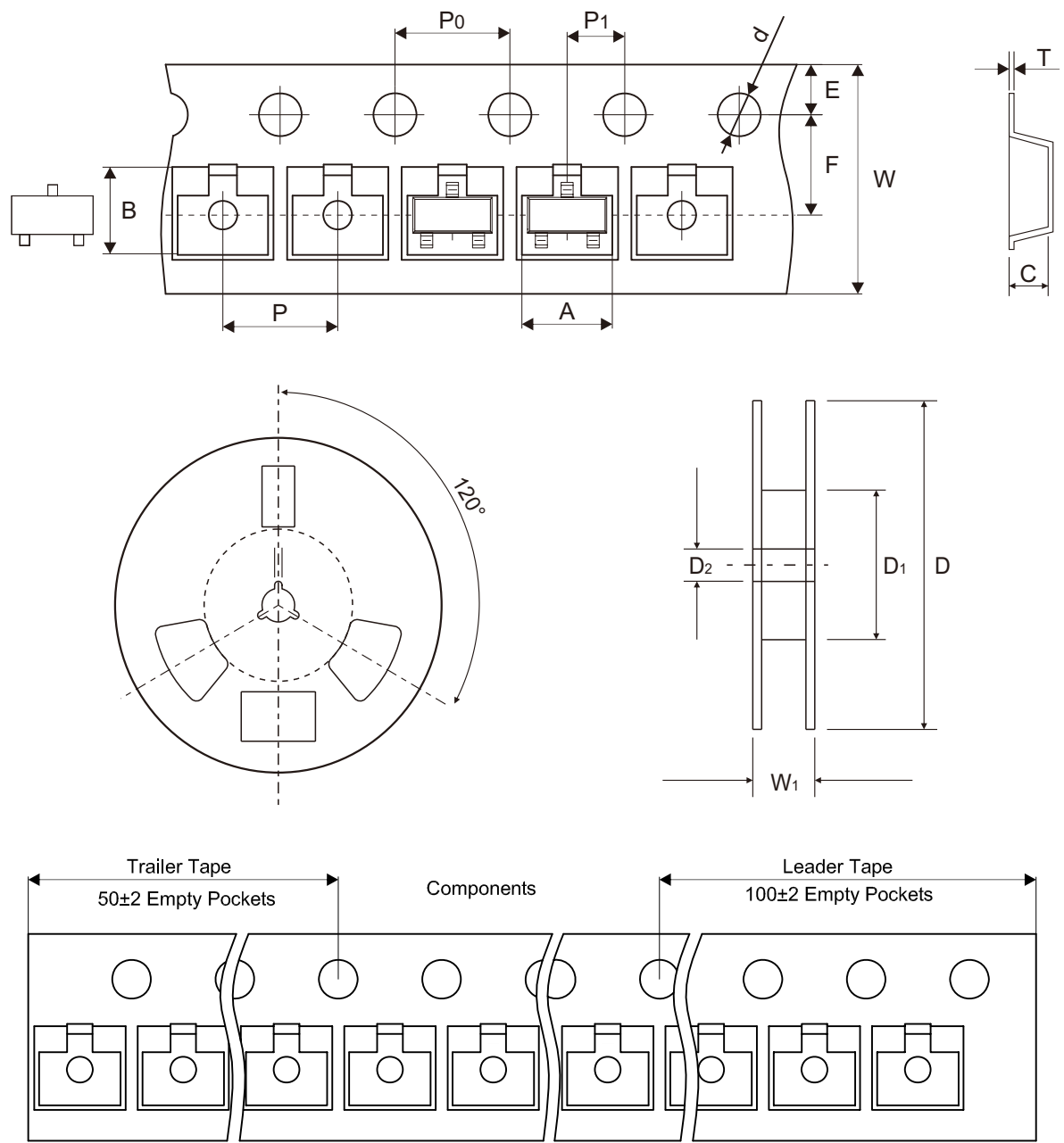


Fig.8 - Maximum Continuous Drain Current vs Ambient Temperature



Reel Taping Specification

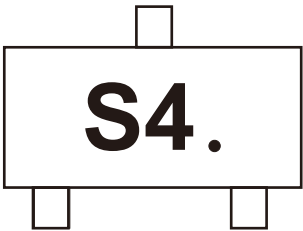


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 + 0.10 - 0.00	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 + 0.004 - 0.000	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	T	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.20 ± 0.02	8.00 + 0.30 - 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.008 ± 0.001	0.315 + 0.012 - 0.004	0.484 ± 0.039

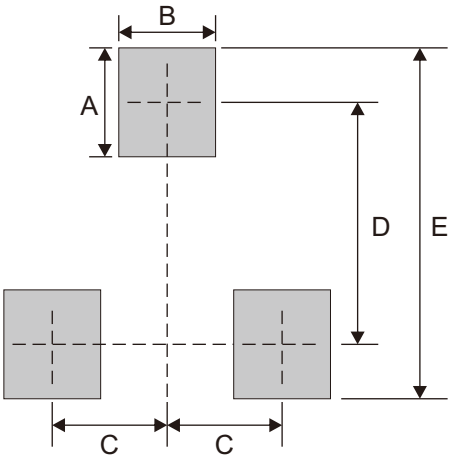
Marking Code

Part Number	Marking Code
CMSN2304A-HF	S4.



Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	0.95	0.037
D	2.00	0.079
E	2.90	0.114



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7

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