

## CMSN3134K-HF

N-Channel  
RoHS Device  
Halogen Free



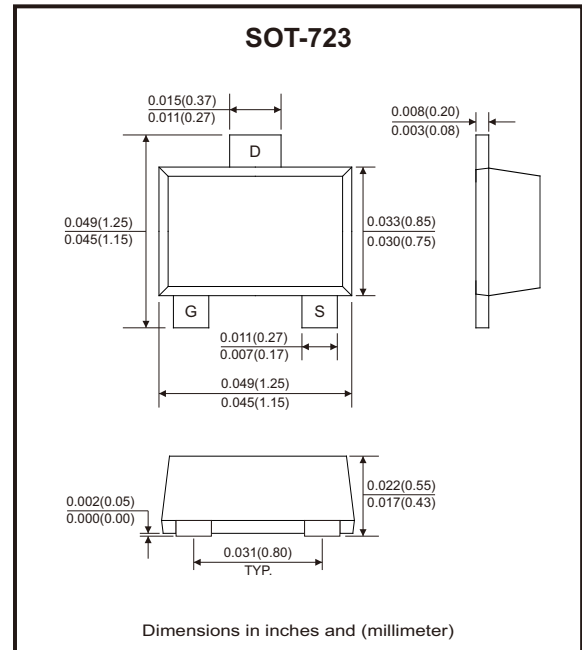
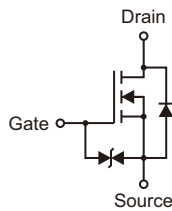
### Features

- ESD protected up to 2kV (HBM).
- High power and current handling capability.

### Mechanical data

- Case: SOT-723, molded plastic.
- Mounting position: Any.

### Circuit Diagram



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

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	20	V
Gate-source voltage	$V_{GS}$	±12	V
Drain current	$I_D$	$T_A=25^\circ\text{C}$	0.5
		$T_A=100^\circ\text{C}$	0.3
Pulsed drain current (Note 1)	$I_{DM}$	4	A
Total power dissipation (Note 2)	$P_D$	$T_A=25^\circ\text{C}$	0.25
		$T_A=100^\circ\text{C}$	0.1
Junction and storage temperature range	$T_J, T_{STG}$	-55 to +150	°C

### Thermal resistance

Parameter	Symbol	Typ	Max	Unit
Thermal resistance junction to ambient (Note 3)	$R_{\theta JA}$	420	500	°C/W

- Notes: 1. Repetitive rating, pulse width limited by max. junction temperature.  
 2.  $P_D$  is based on max. junction temperature, using junction case thermal resistance.  
 3. The value of  $R_{\theta JA}$  is measured with the device mounted on the minimum recommend pad size, in the still air environment with  $T_A=25^\circ\text{C}$ . The maximum allowed junction temperature of  $150^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

## Electrical Characteristics (at T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Static Parameters</b>						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	20			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V			1	μA
		V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 150°C			100	
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V		2	±10	μA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	0.35	0.75	1.1	V
Static drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.5A		200	300	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 0.4A		290	400	
		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 0.2A		480	700	
Diode forward voltage	V <sub>SD</sub>	I <sub>S</sub> = 0.5A, V <sub>GS</sub> = 0V		0.9	1.2	V
Gate resistance	R <sub>G</sub>	f = 1MHZ, Open drain		50		Ω
Max. body-diode continuous current	I <sub>S</sub>				0.5	A
<b>Dynamic Parameters</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1MHz		56		pF
Output capacitance	C <sub>oss</sub>			20		
Reverse transfer capacitance	C <sub>rss</sub>			2.5		
<b>Switching Parameters</b>						
Total gate charge	Q <sub>g</sub>	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.5A		1		nC
Gate-source charge	Q <sub>gs</sub>			0.28		
Gate-drain charge	Q <sub>gd</sub>			0.22		
Reverse recovery charge	Q <sub>rr</sub>	I <sub>F</sub> = 0.5A, di / dt = 20A/μs		0.4		ns
Reverse recovery time	t <sub>rr</sub>			14.4		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>GS</sub> = 4.5V, V <sub>DD</sub> = 10V, I <sub>D</sub> = 0.5A, R <sub>GEN</sub> = 10Ω		2		ns
Turn-on rise time	t <sub>r</sub>			18.8		
Turn-off delay time	t <sub>d(off)</sub>			10		
Turn-off fall time	t <sub>f</sub>			23		

## Typical Rating and Characteristic Curves (CMSN3134K-HF)

Fig.1 - Output Characteristics

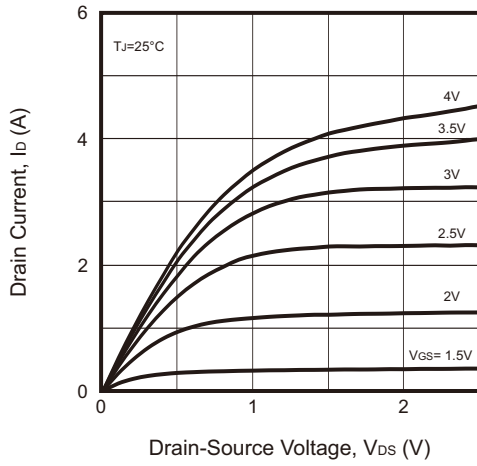


Fig.2 - Transfer Characteristics

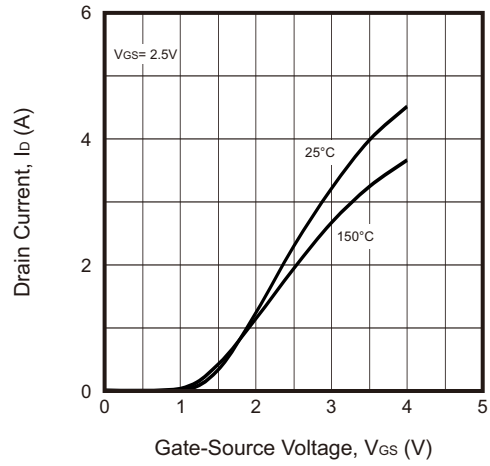


Fig.3 - Capacitance Characteristics

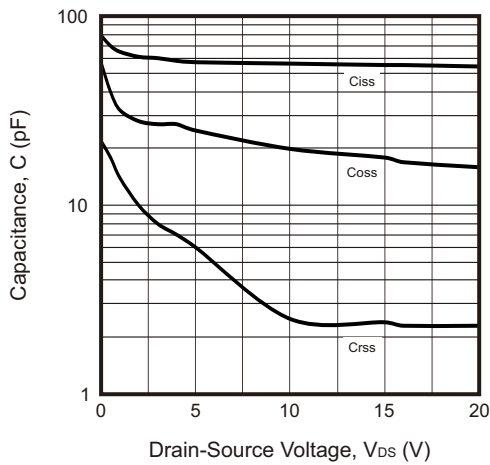


Fig.4 - Gate Charge

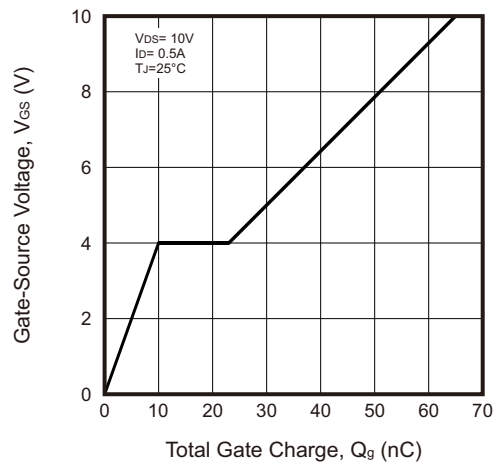


Fig.5 - On Resistance vs Gate to Source Voltage

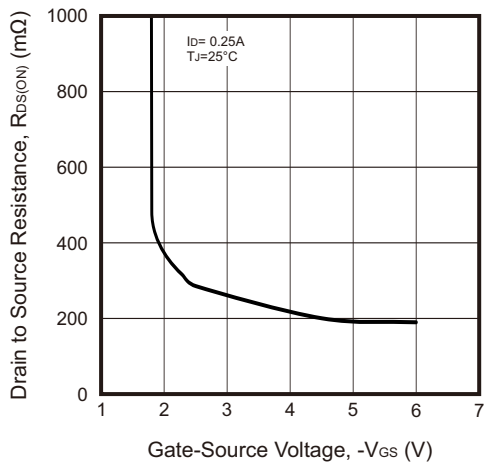
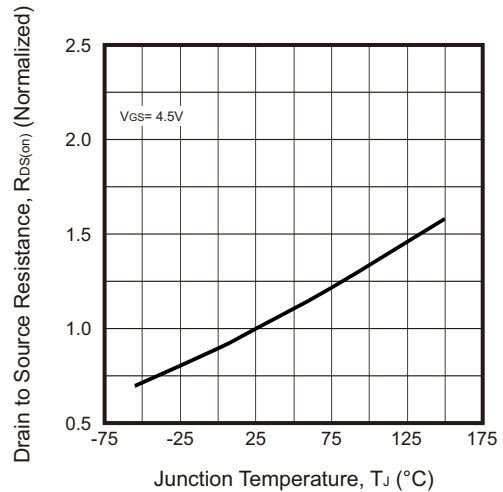


Fig.6 - Normalized on Resistance



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Fig.7 -  $R_{DS(on)}$  vs Drain Current

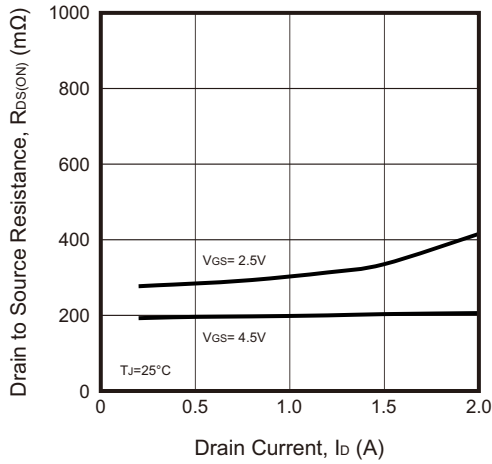


Fig.8 - Forward Characteristics of Reverse Diode

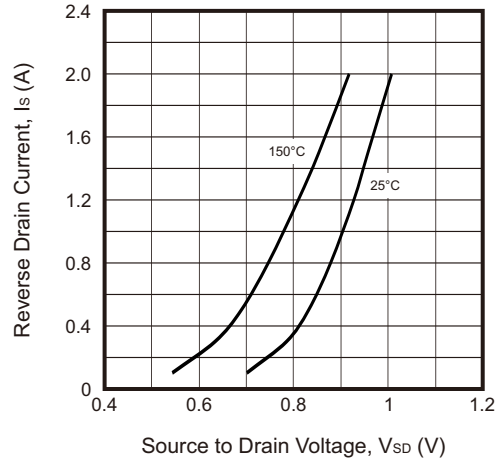


Fig.9 - Normalized Breakdown Voltage

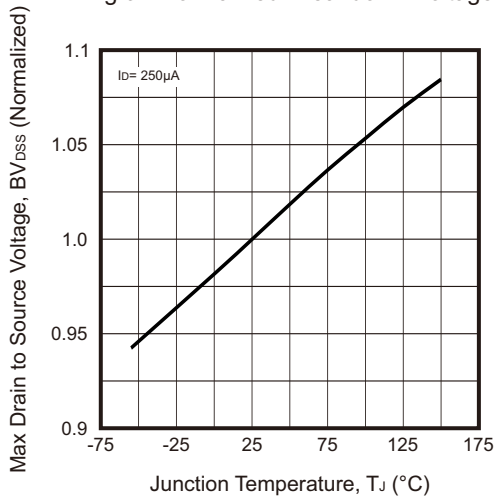


Fig.10 - Normalized Threshold Voltage

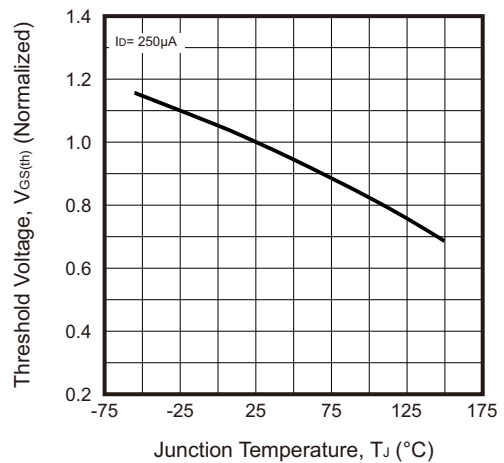


Fig.11 - Current Dissipation

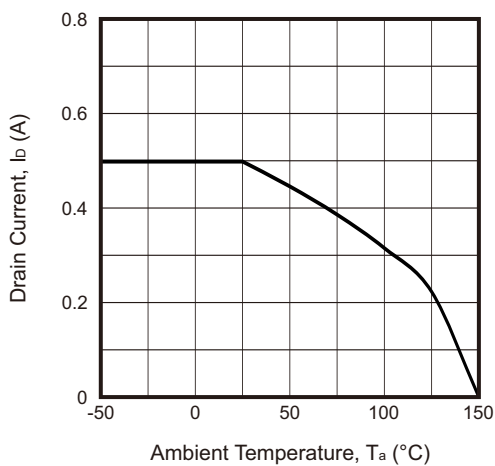
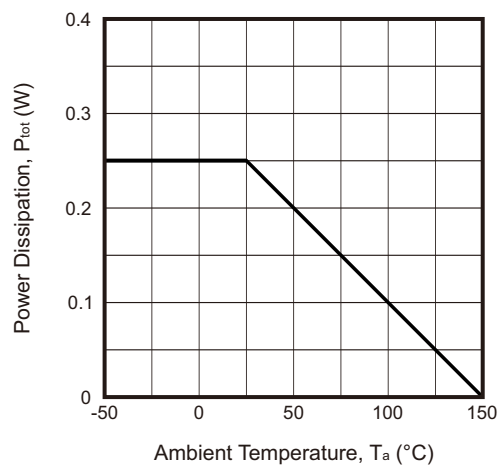
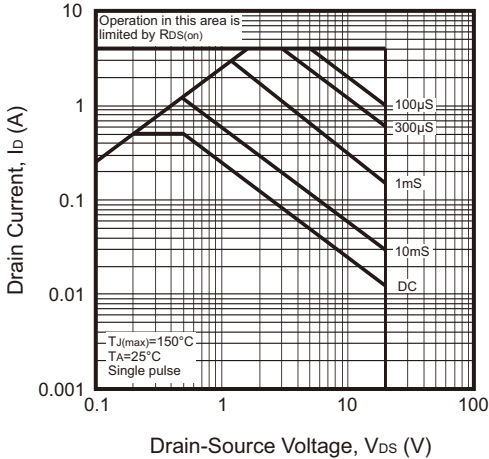


Fig.12 - Power Dissipation

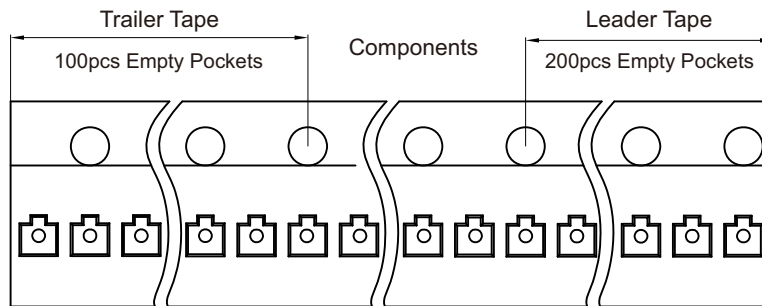
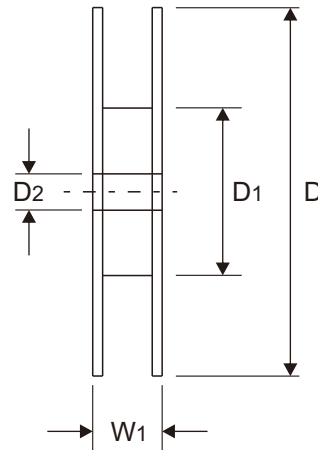
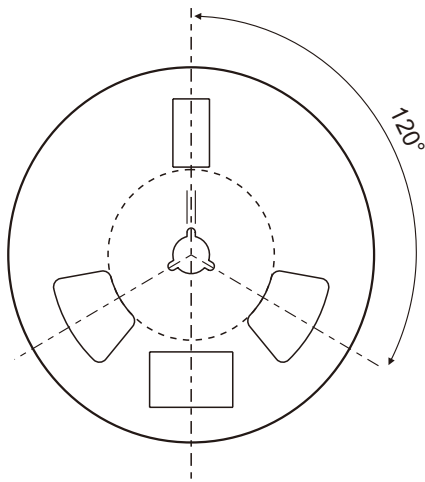
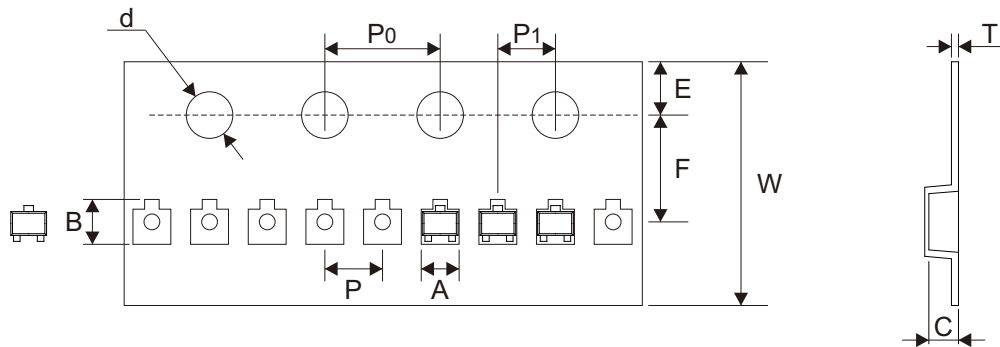


Typical Rating and Characteristic Curves (CMSN3134K-HF)

Fig.13 - Safe Operation Area



## Reel Taping Specification

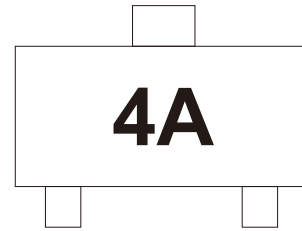


SOT-723	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	1.38 ± 0.05	1.40 ± 0.05	0.60 ± 0.05	1.50 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.054 ± 0.002	0.055 ± 0.002	0.024 ± 0.002	0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-723	SYMBOL	E	F	P	P0	P1	T	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.05	2.00 ± 0.05	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	0.079 ± 0.002	0.157 ± 0.004	0.079 ± 0.002	0.008 ± 0.001	0.315 + 0.012 - 0.004	0.484 ± 0.039

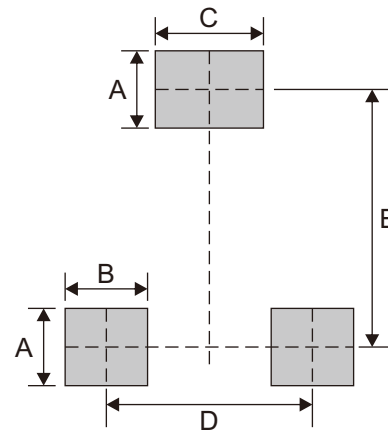
## Marking Code

Part Number	Marking Code
CMSN3134K-HF	4A



## Suggested P.C.B. PAD Layout

SIZE	SOT-723	
	(mm)	(inch)
A	0.30	0.012
B	0.32	0.013
C	0.42	0.017
D	0.80	0.031
E	1.00	0.039



## Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-723	8,000	7