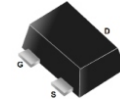


CMSP3139K-HF

P-Channel
RoHS Device
Halogen Free



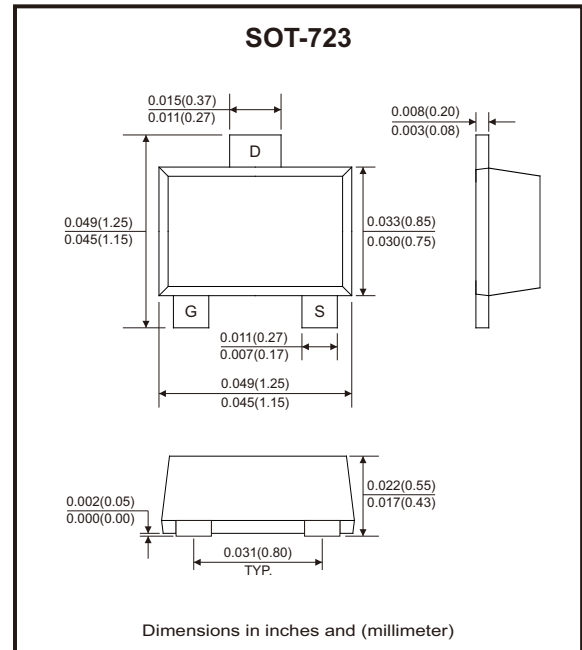
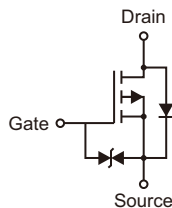
Features

- Extremely low switching loss.
- Excellent stability and uniformity.

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}	± 10	V
Drain current	$T_A=25^\circ\text{C}$	I_D	-0.5	A
	$T_A=100^\circ\text{C}$		-0.3	
Pulsed drain current (Note 1)		I_{DM}	-2.5	A
Total power dissipation (Note 2)	$T_A=25^\circ\text{C}$	P_D	0.28	W
	$T_A=100^\circ\text{C}$		0.1	
Junction and storage temperature range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Thermal resistance

Parameter		Symbol	Typ	Max	Unit
Thermal resistance junction to ambient (Note 3)	Steady-state	$R_{\theta JA}$	350	450	$^\circ\text{C/W}$

Notes: 1. Pulse width limited by max. junction temperature.

2. P_D is based on max. junction temperature, using junction case and junction ambient 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°C . The value in any given application depends on the user's specific board design.

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	-20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V			-1	μA
		V _{DS} = -20V, V _{GS} = 0V, T _J = 150°C			-100	
Gate-body leakage current	I _{GSS}	V _{GS} = ±10V, V _{DS} = 0V			±10	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.35	-0.7	-1.1	V
Static drain-source on-resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -0.5A		650	850	mΩ
		V _{GS} = -2.5V, I _D = -0.3A		900	1200	
		V _{GS} = -1.8V, I _D = -0.2A		1400	2000	
Diode forward voltage	V _{SD}	I _S = -0.5A, V _{GS} = 0V		-0.95	-1.2	V
Max. body-diode continuous current	I _S				-0.5	A
Dynamic Parameters						
Input capacitance	C _{iss}	V _{DS} = -10V, V _{GS} = 0V, f = 1MHz		40		pF
Output capacitance	C _{oss}			15		
Reverse transfer capacitance	C _{rss}			10		
Switching Parameters						
Total gate charge	Q _g	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -0.5A		1.24		nC
Gate-source charge	Q _{gs}			0.37		
Gate-drain charge	Q _{gd}			0.27		
Reverse recovery charge	Q _{rr}	I _F = -0.5A, di / dt = 100A/μs		0.97		ns
Reverse recovery time	t _{rr}			26		
Turn-on delay time	t _{d(on)}	V _{GS} = -4.5V, V _{DD} = -10V, I _D = -0.5A, R _{GEN} = 3Ω		4		
Turn-on rise time	t _r			19		
Turn-off delay time	t _{d(off)}			16		
Turn-off fall time	t _f			25		

Typical Rating and Characteristic Curves (CMSP3139K-HF)

Fig.1 - Output Characteristics

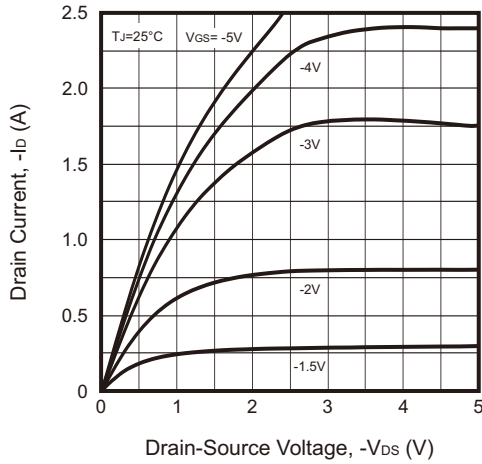


Fig.2 - Transfer Characteristics

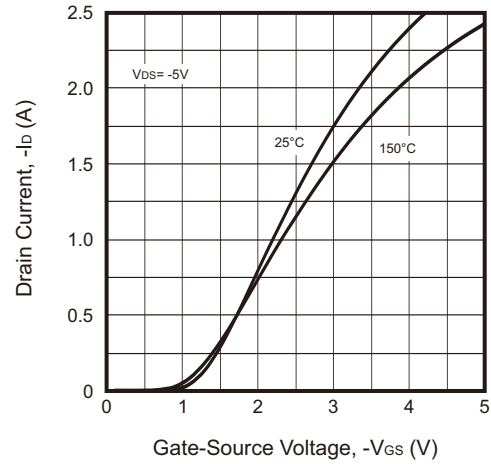


Fig.3 - Capacitance Characteristics

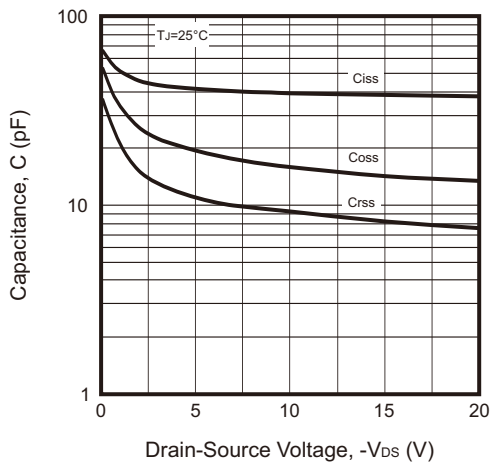


Fig.4 - Gate Charge

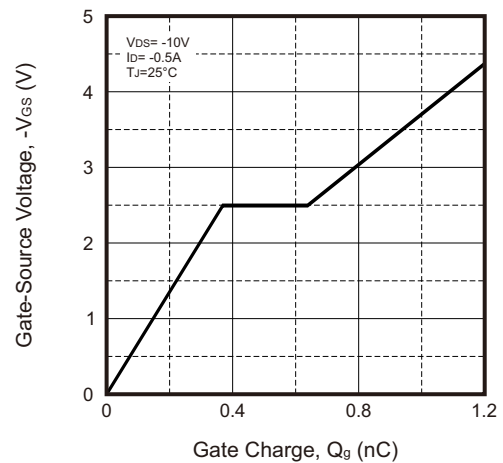


Fig.5 - On Resistance vs Gate to Source Voltage

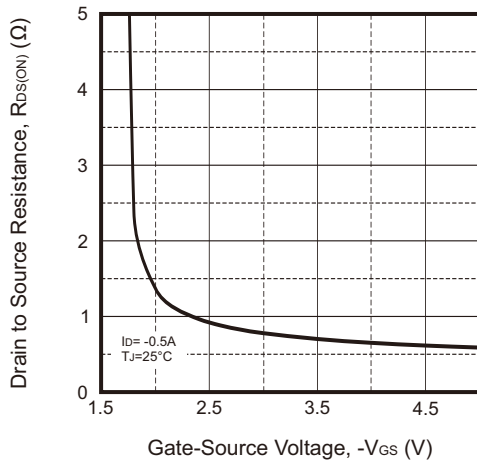
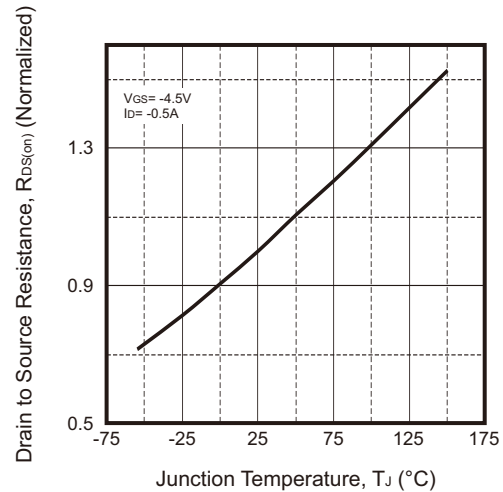


Fig.6 - Normalized on Resistance



Typical Rating and Characteristic Curves (CMSP3139K-HF)

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

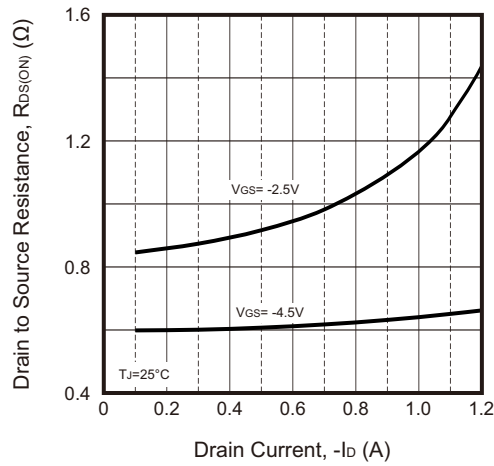


Fig.8 - Forward Characteristics of Reverse Diode

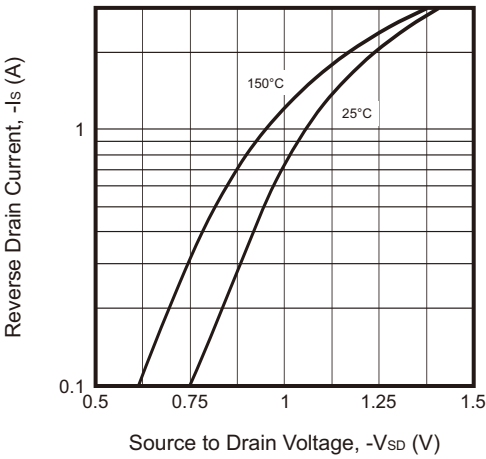


Fig.9 - Normalized Breakdown Voltage

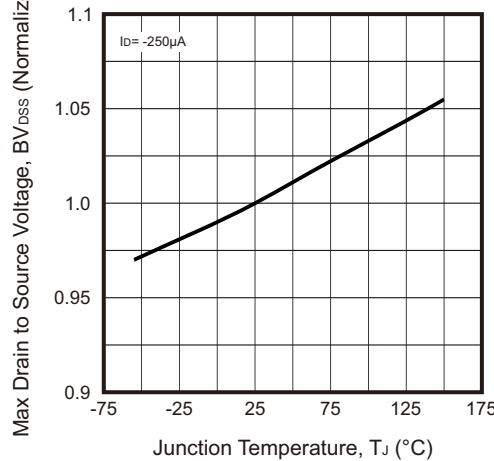


Fig.10 - Normalized Threshold Voltage

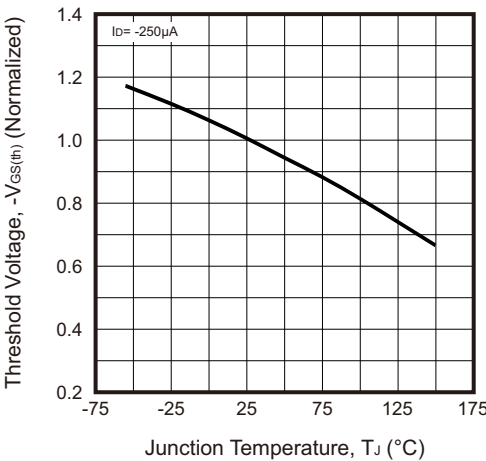


Fig.11 - Current Dissipation

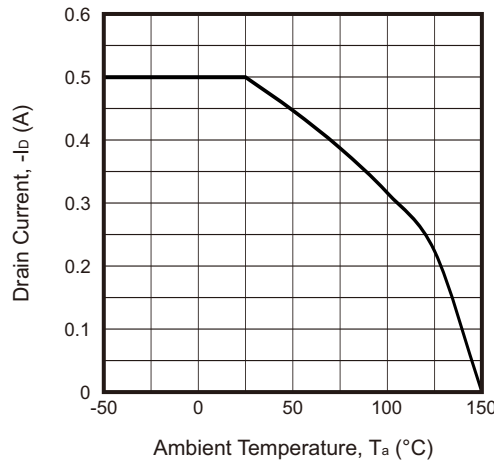
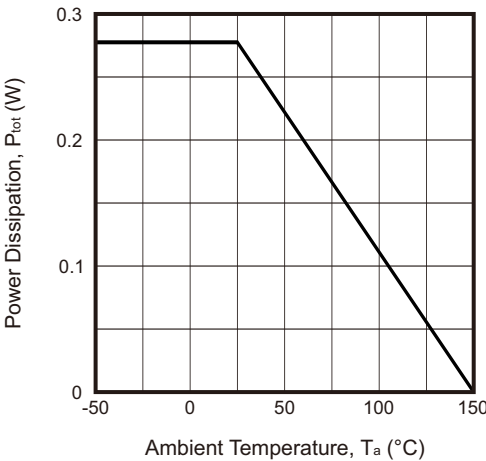
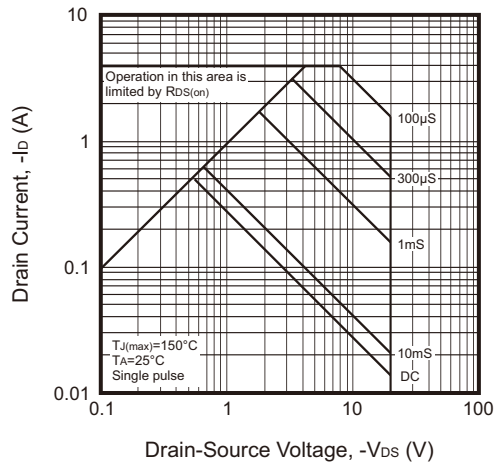


Fig.12 - Power Dissipation

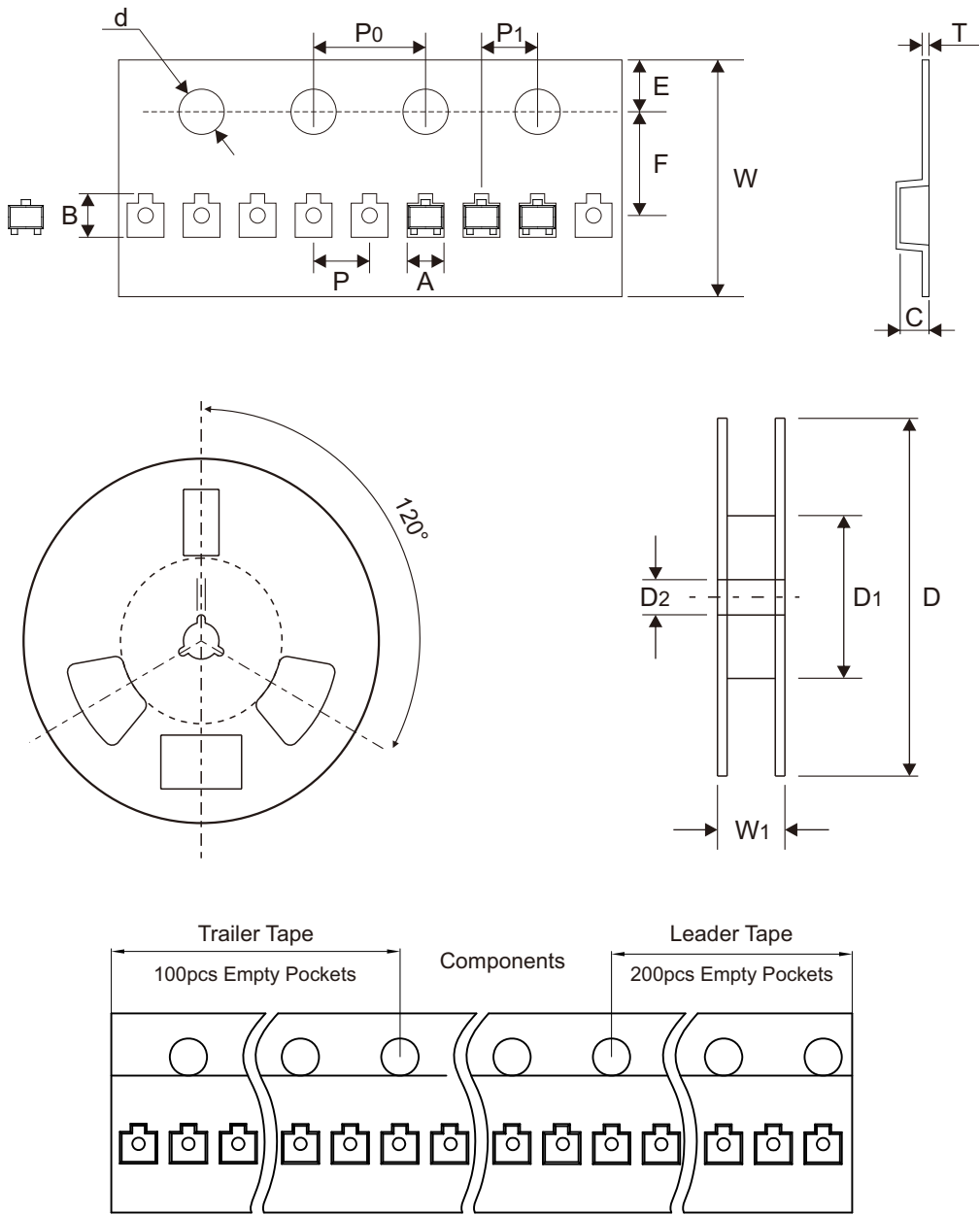


Typical Rating and Characteristic Curves (CMSP3139K-HF)

Fig.13 - Safe Operation Area



Reel Taping Specification

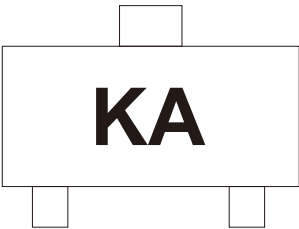


SOT-723	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	1.38 ± 0.05	1.40 ± 0.05	0.60 ± 0.05	1.50 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.054 ± 0.002	0.055 ± 0.002	0.024 ± 0.002	0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

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

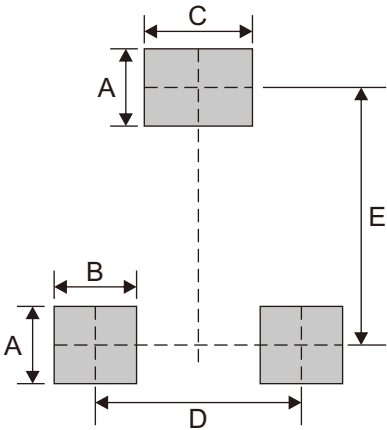
Marking Code

Part Number	Marking Code
CMSP3139K-HF	KA



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