

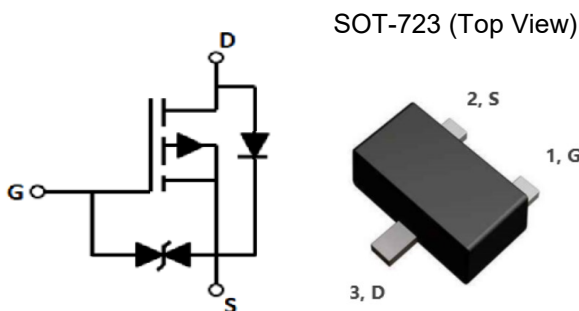
Description

CM3139K is the P-Channel enhancement mode power field effect transistors with high cell density, trench technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance.

Features

- V_{DS} : -20V
- I_D : -0.59A
- $R_{DS(on)}$ (@ $V_{GS}=-4.5V$): < 520m Ω
- $R_{DS(on)}$ (@ $V_{GS}=-2.5V$): < 750m Ω
- High density cell design for extremely low $R_{DS(on)}$
- Excellent on-resistance and DC current capability

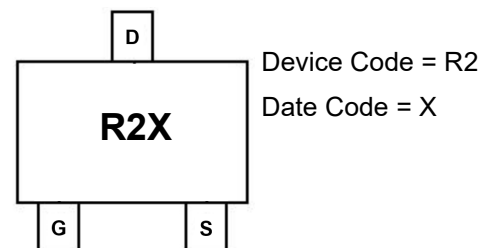
Equivalent Circuit and Pin Configuration



Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Portable Instrumentation
- Load switch

Marking Information



Ordering Information

Part Number	Packaging	Reel Size
CM3139K	8000/Tape & Reel	7 inch

Absolute Maximum Ratings (TA=25 °C unless otherwise noted)

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		V_{DS}	-20	V
Gate-source Voltage		V_{GS}	± 10	V
Continuous Drain Current	$T_A=25^\circ\text{C}$, Steady State	I_D	-0.59	A
	$T_A=75^\circ\text{C}$, Steady State		-0.46	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	-2.4	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$ ⁽²⁾ @Steady State		P_D	310	mW
Thermal Resistance Junction-to-Ambient ⁽²⁾ @Steady State		$R_{\theta JA}$	400	$^\circ\text{C/W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (T_J=25 °C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
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, T _C =25°C			-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±10	uA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.35		-1.2	V
Static Drain-Source on-Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-0.6A		360	520	mΩ
		V _{GS} =-2.5V, I _D =-0.5A		570	750	
Diode Forward Voltage	V _{SD}	I _S =-0.59A, V _{GS} =0V		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I _S				-0.59	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1MHz		128		pF
Output Capacitance	C _{oss}			97		
Reverse Transfer Capacitance	C _{rss}			62		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-2.0A		3.9		nC
Gate Source Charge	Q _{gs}			0.7		
Gate Drain Charge	Q _{gd}			0.9		
Turn-on Delay Time	t _{D(on)}	V _{GS} =-4.5V, V _{DD} =-10V, I _D =-1.0A, R _{GEN} =2.5Ω		12		ns
Turn-on Rise Time	t _r			54		
Turn-off Delay Time	t _{D(off)}			15		
Turn-off Fall Time	t _f			9		

Noted: (1) Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

(2) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. With 2oz Copper, t ≤ 10s

Typical Performance Characteristics

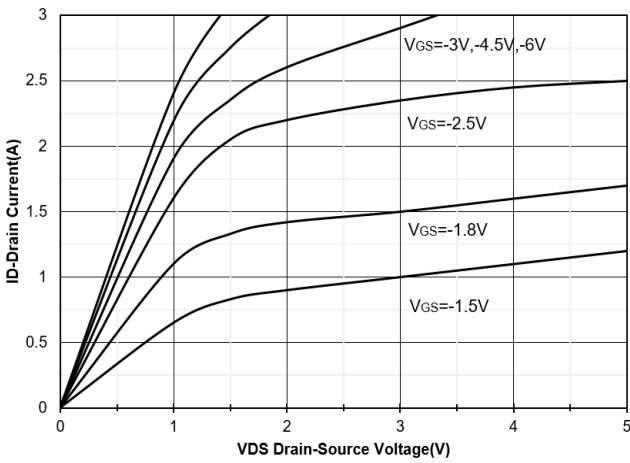


Figure 1. Output Characteristics

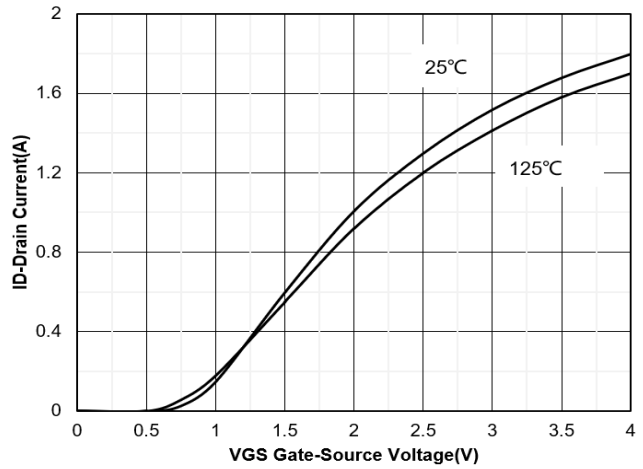


Figure 2. Transfer Characteristics

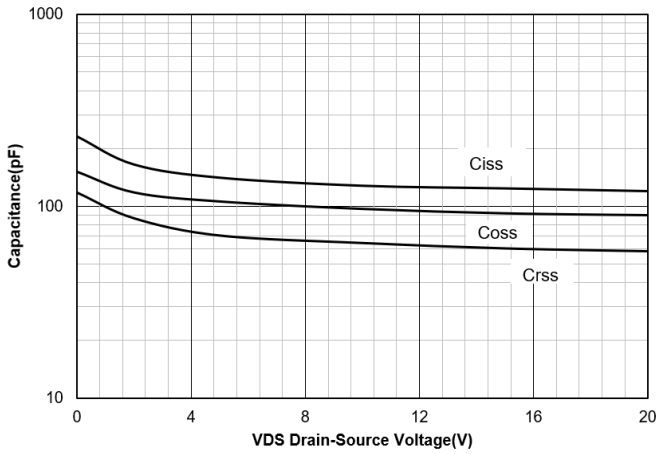


Figure 3. Capacitance Characteristics

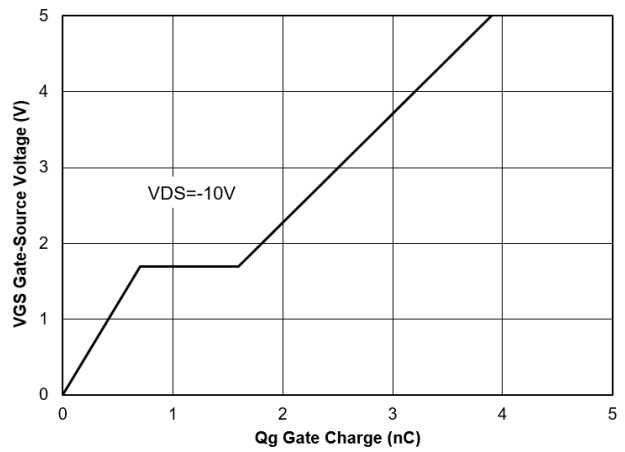


Figure 4. Gate Charge

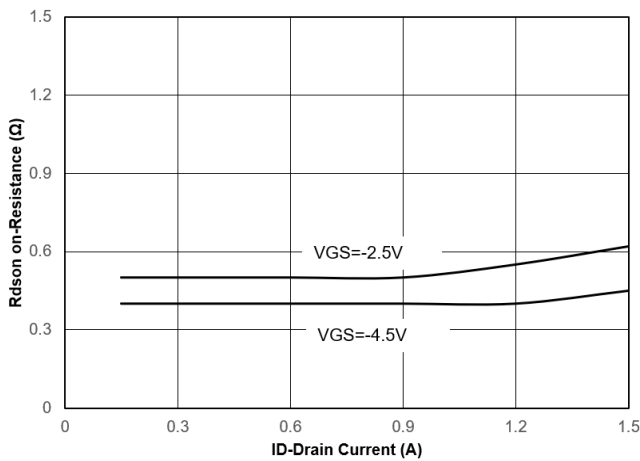


Figure 5. Drain-Source on Resistance

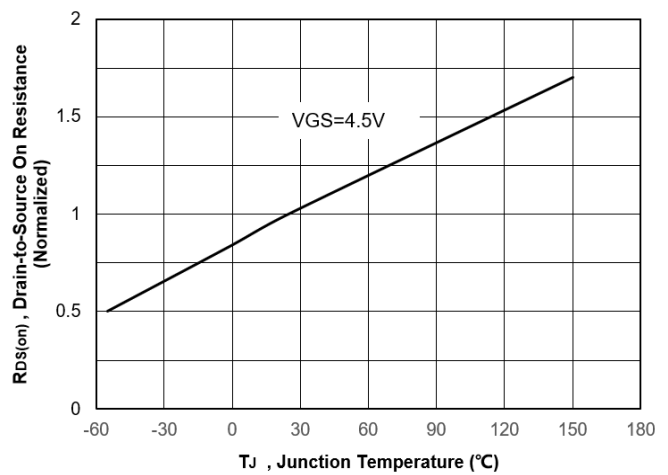


Figure 6. Normalized On-Resistance Vs. Temperature

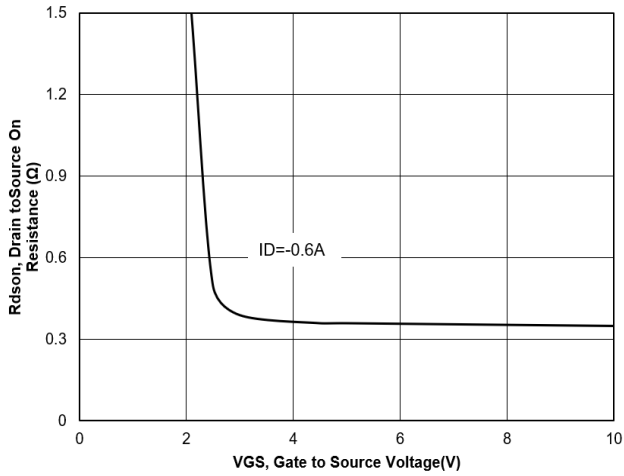


Figure 7. Typical Drain to Source ON Resistance

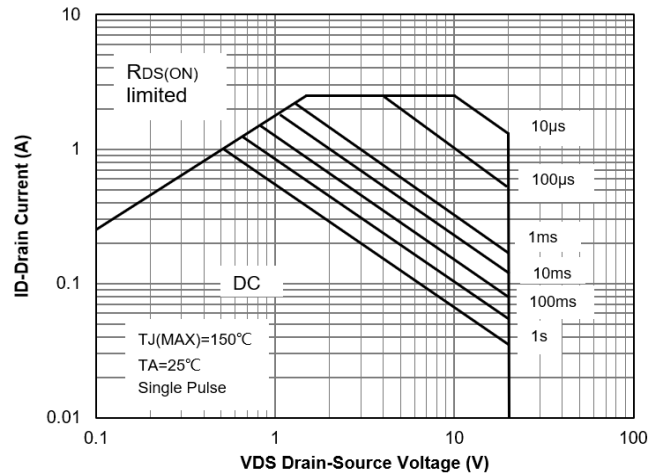


Figure 8. Safe Operation Area

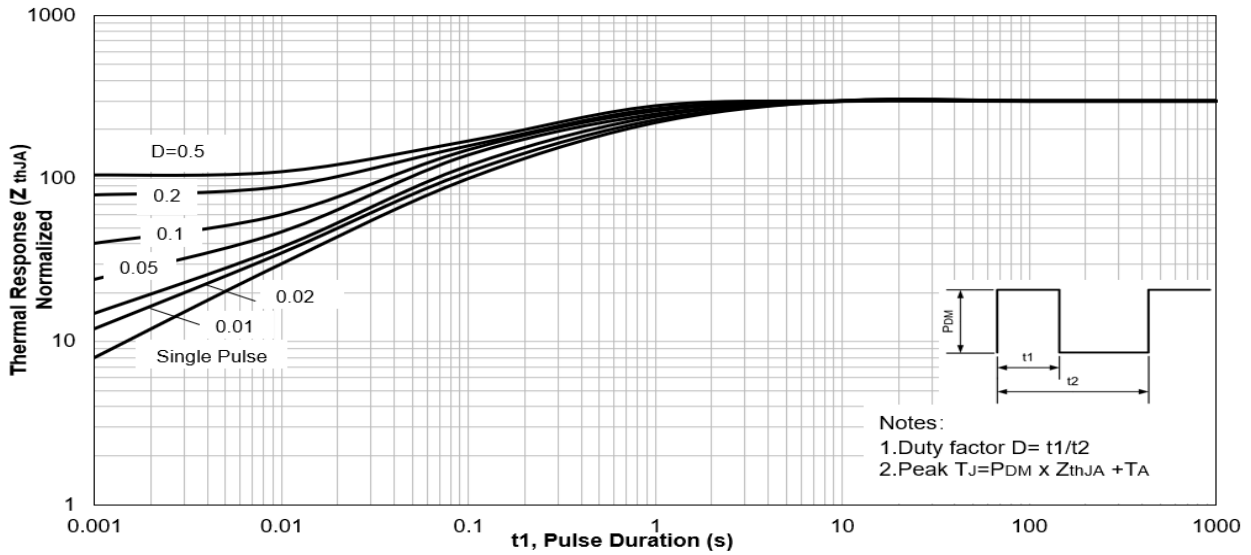


Figure 9. Maximum Effective Transient Thermal Impedance ,Junction-to-Ambient

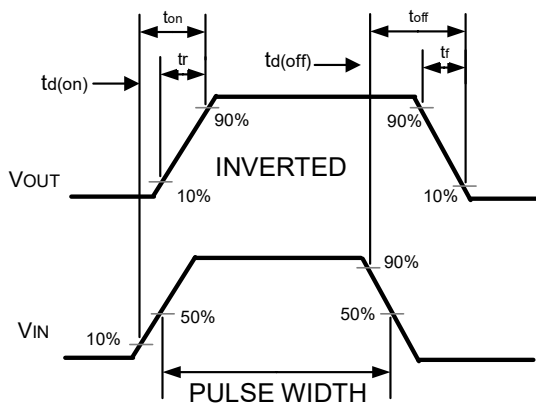
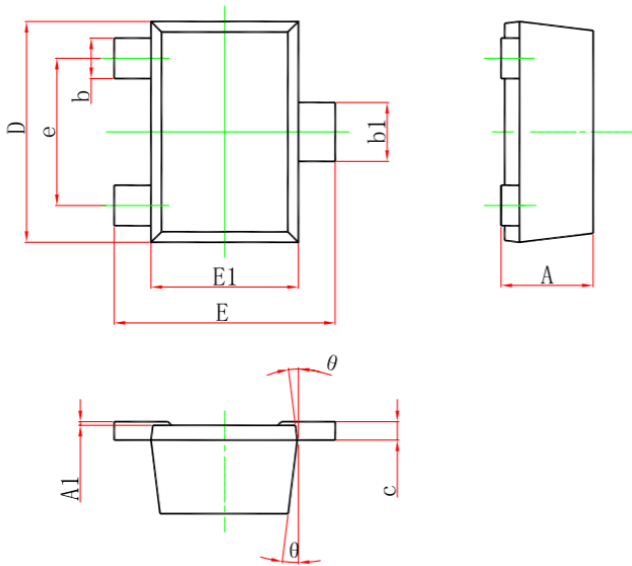


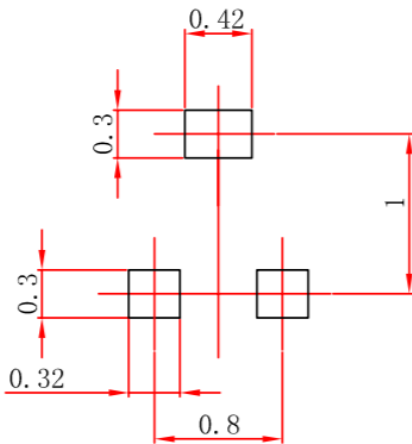
Figure 10. Switching wave

SOT-723 Package Outline Drawing



SYM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.430	0.500	0.017	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800 TYP.		0.800 TYP.	
θ	7° REF.		7° REF.	

Suggested Land Pattern



Contact Information

Applied Power Microelectronics Inc.

Website: <http://www.appliedpowermicro.com>

Email: sales@appliedpowermicro.com

Phone: +86 (0519) 8399 3606