

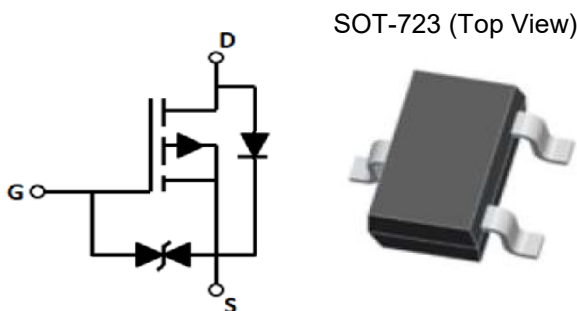
### Description

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 $\Omega$
- $R_{DS(on)}$  (@ $V_{GS}=-2.5V$ ) : < 750m $\Omega$
- High density cell design for extremely low  $R_{DS(on)}$
- Excellent on-resistance and DC current capability

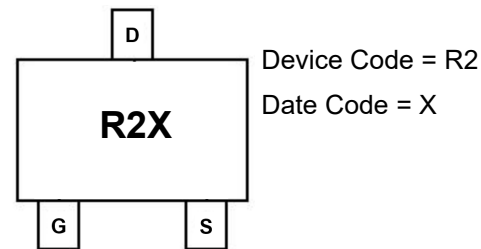
### Equivalent Circuit and Pin Configuration



### 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		$V_{GS}$	$\pm 10$	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 <sup>(1)</sup>		$I_{DM}$	-2.4	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$ <sup>(2)</sup> @Steady State		PD	310	mW
Thermal Resistance Junction-to-Ambient <sup>(2)</sup> @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<sub>J</sub>=25 °C unless otherwise noted)**

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

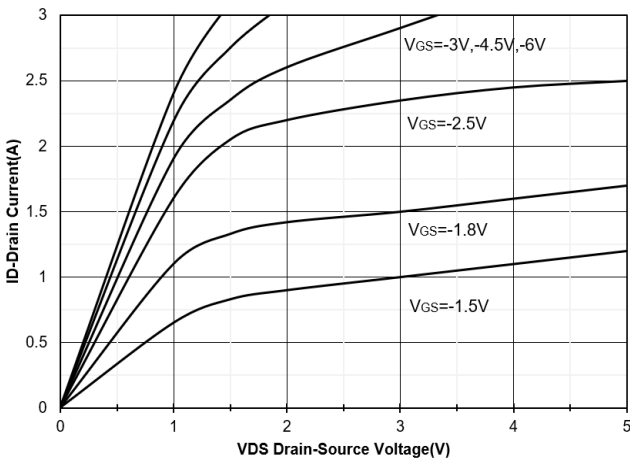


Figure 1. Output Characteristics

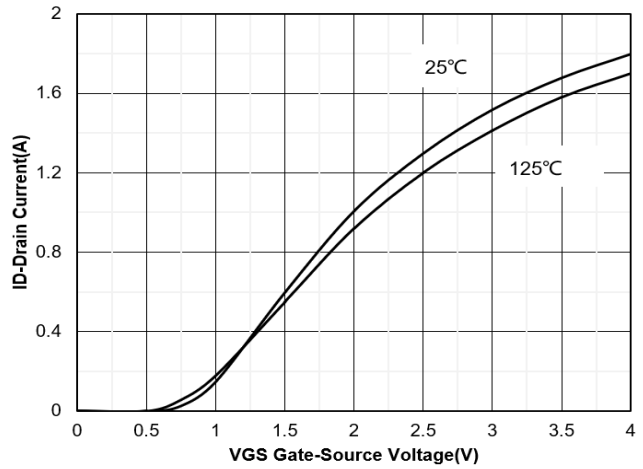


Figure 2. Transfer Characteristics

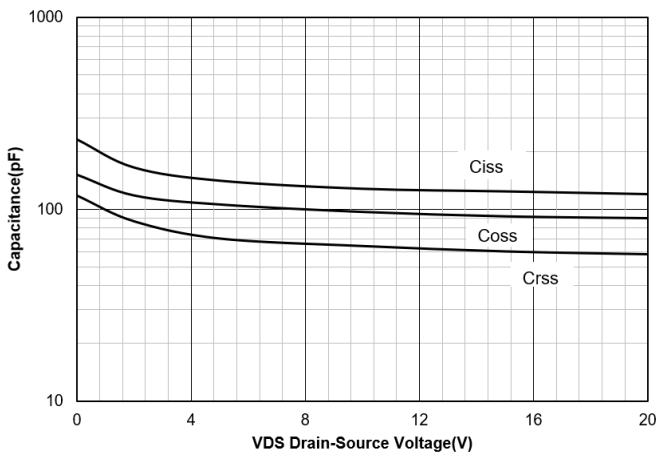


Figure 3. Capacitance Characteristics

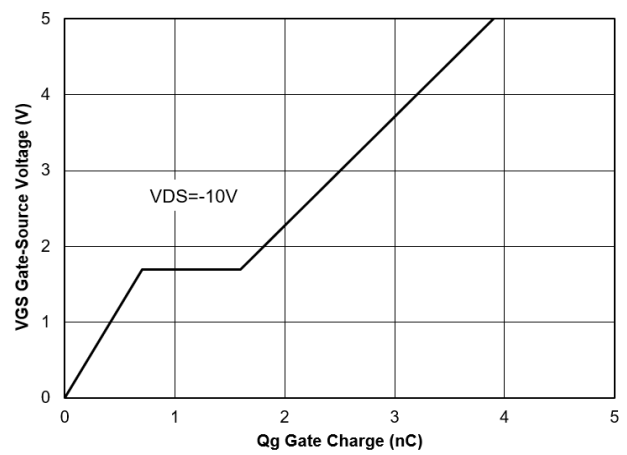


Figure 4. Gate Charge

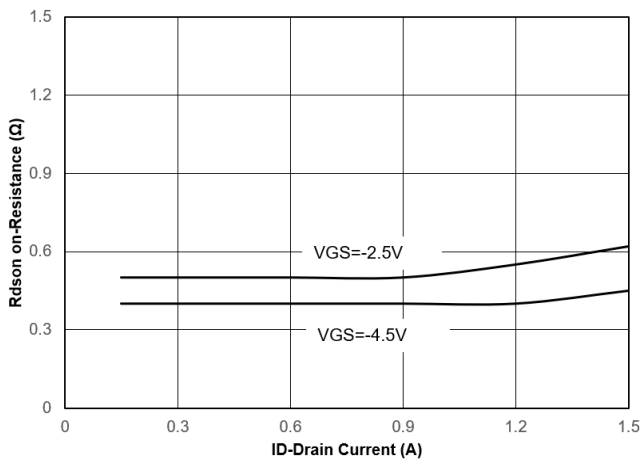


Figure 5. Drain-Source on Resistance

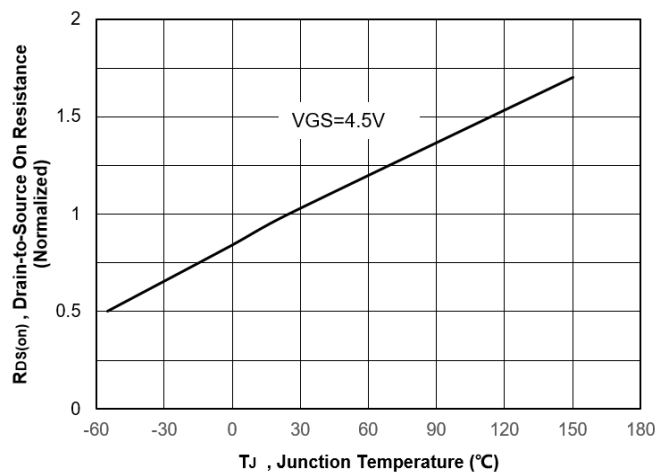


Figure 6. Normalized On-Resistance Vs. Temperature

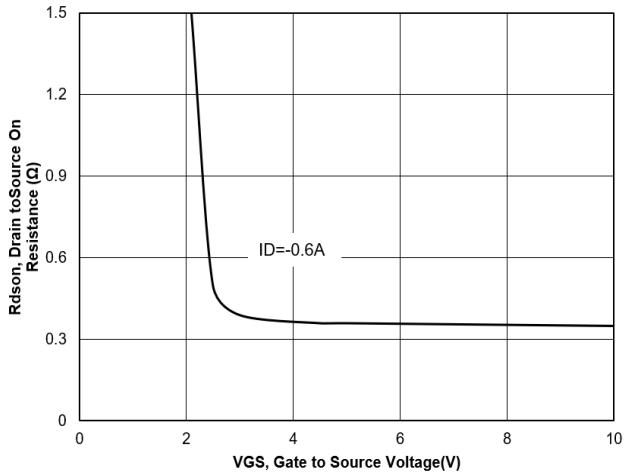


Figure 7. Typical Drain to Source ON Resistance

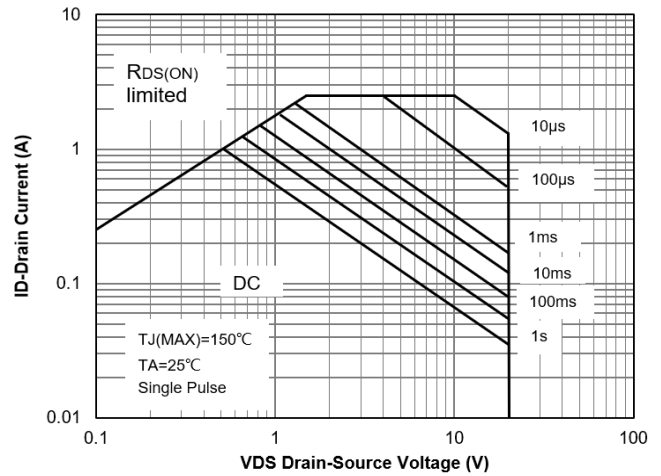


Figure 8. Safe Operation Area

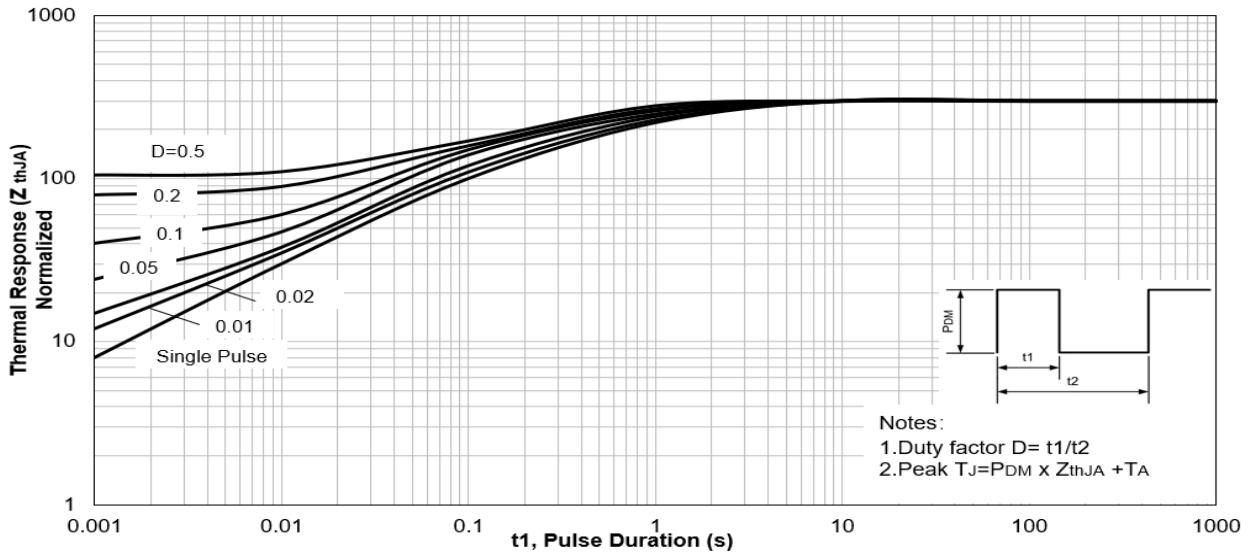


Figure 9. Maximum Effective Transient Thermal Impedance ,Junction-to-Ambient

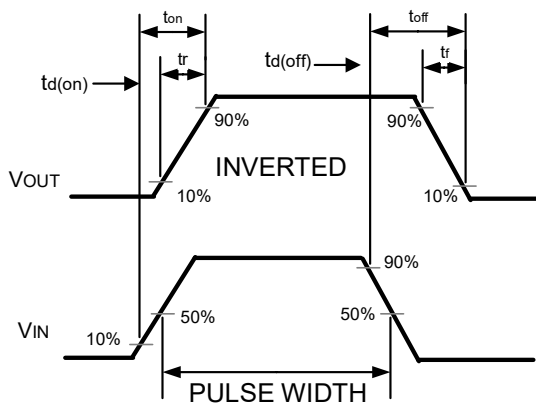
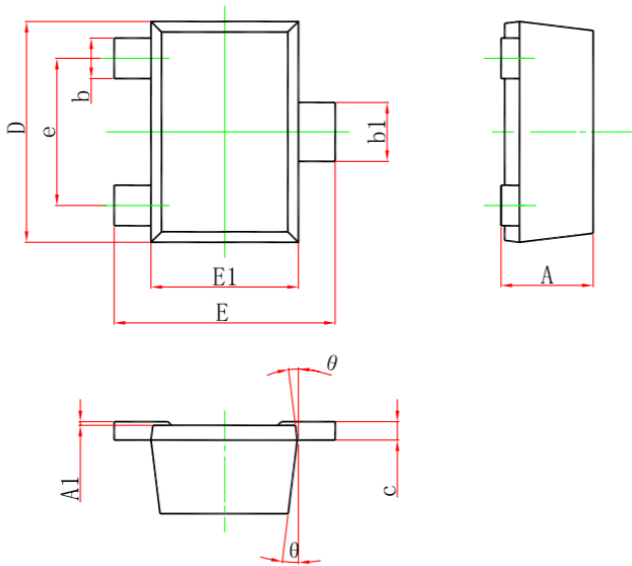


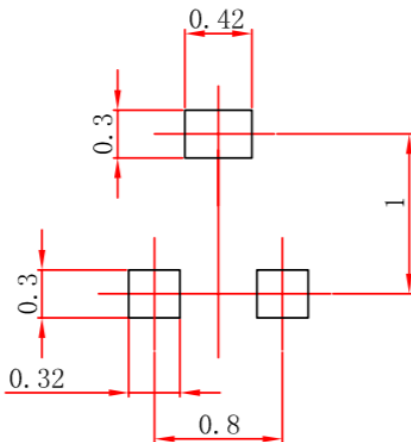
Figure 10. Switching wave

### 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

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