

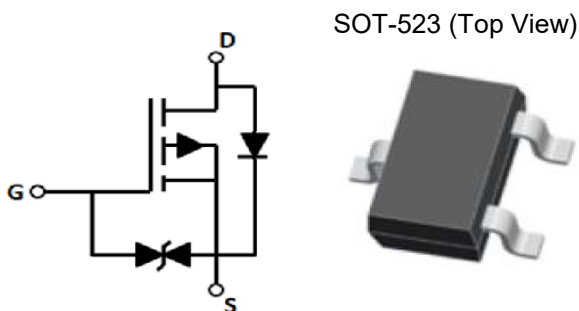
Description

CM3139T 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

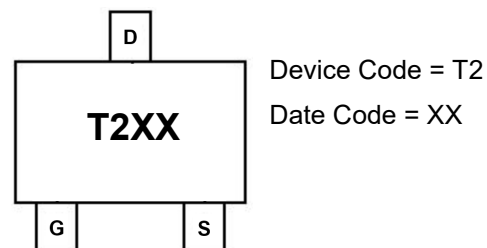
Equivalent Circuit and Pin Configuration



Applications

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

Marking Information



Ordering Information

Part Number	Packaging	Reel Size
CM3139T	3000/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		320	520	mΩ
		V _{GS} =-2.5V, I _D =-0.5A		430	750	
Diode Forward Voltage	V _{SD}	I _S =-0.59A, V _{GS} =0V			-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		68		pF
Output Capacitance	C _{oss}			14		
Reverse Transfer Capacitance	C _{rss}			8		
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) Surface mounted on FR4 board using the minimum recommended pad size.

Typical Performance Characteristics

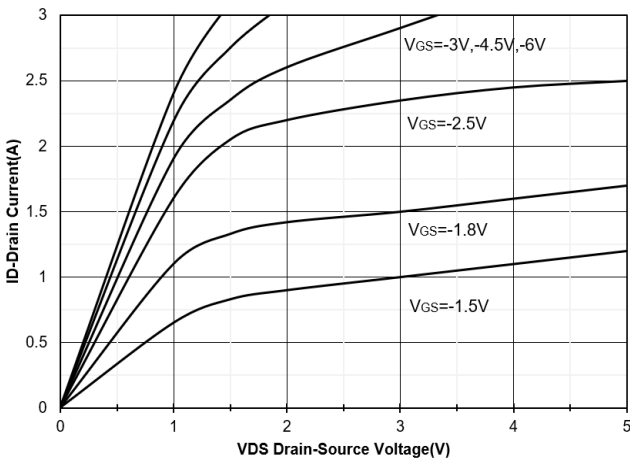


Figure 1. Output Characteristics

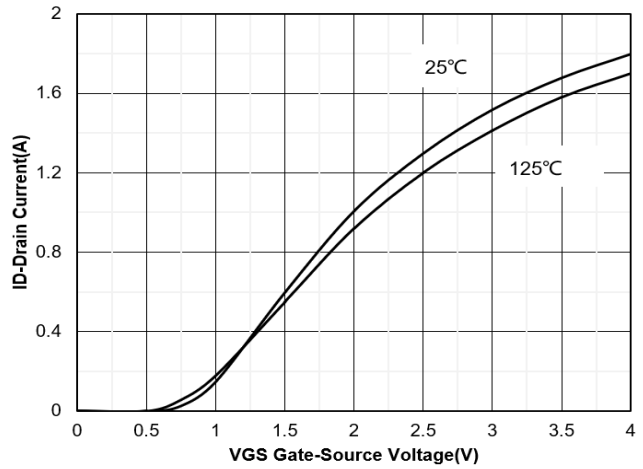


Figure 2. Transfer Characteristics

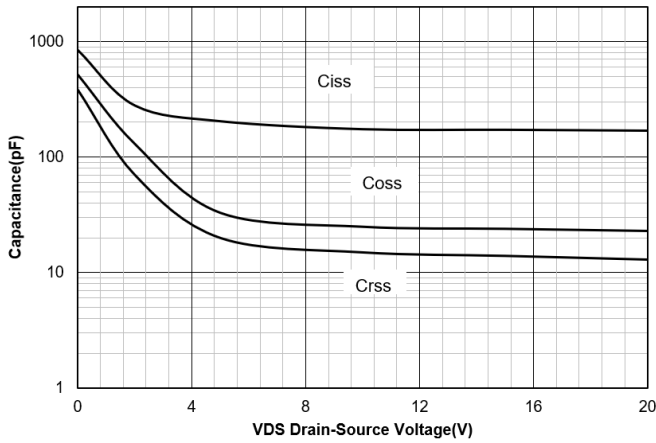


Figure 3. Capacitance Characteristics

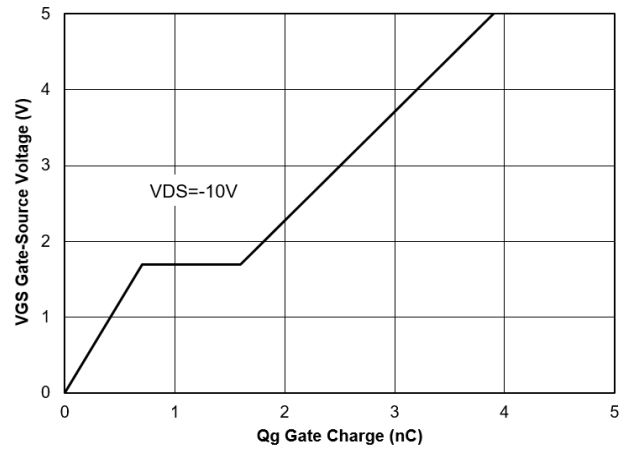


Figure 4. Gate Charge

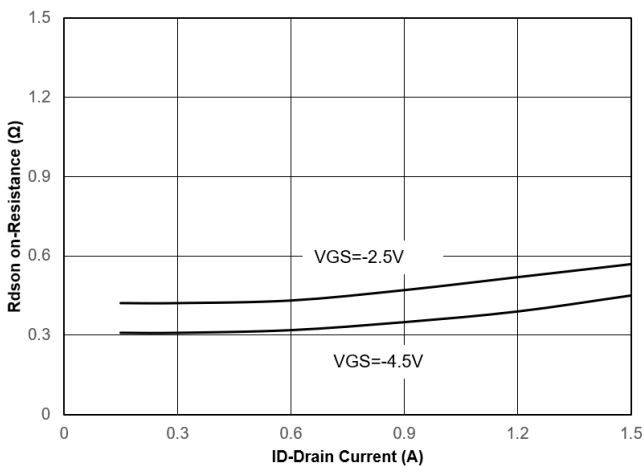


Figure 5. Drain-Source on Resistance

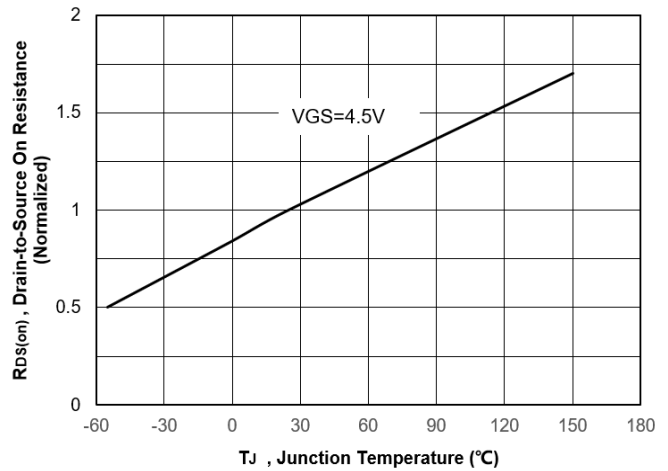


Figure 6. Normalized On-Resistance Vs. Temperature

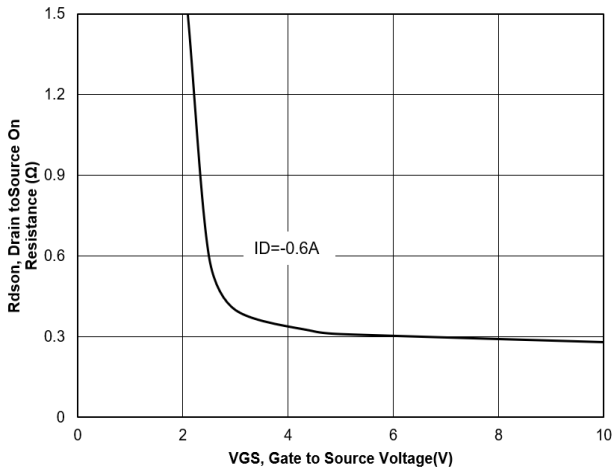


Figure 7. Typical Drain to Source ON Resistance VS Gate Voltage and Drain Current

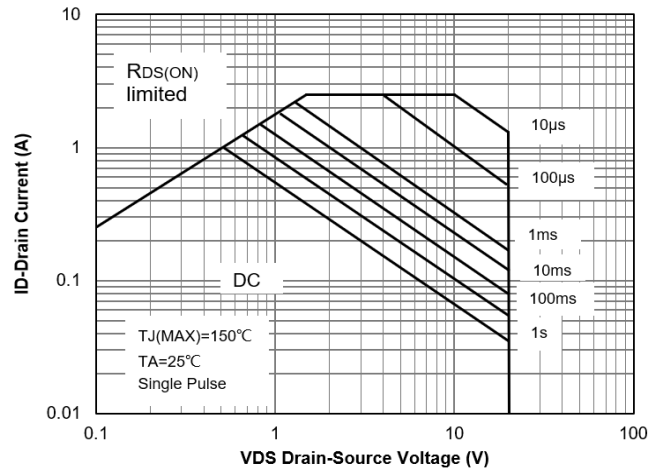


Figure 8. Safe Operation Area

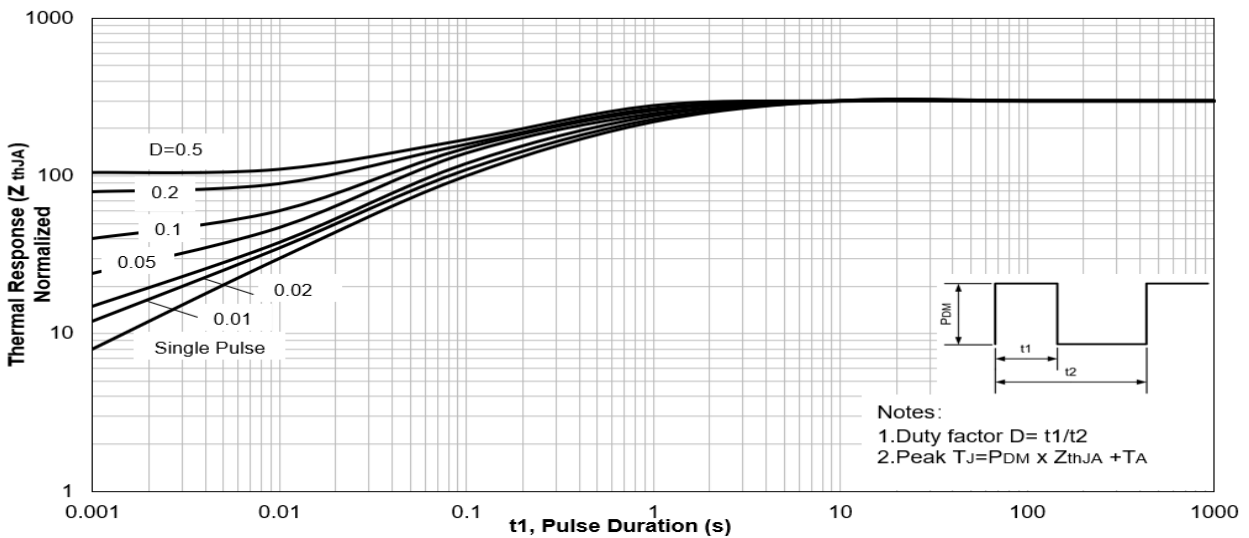


Figure 9. Maximum Effective Transient Thermal Impedance ,Junction-to-Ambient

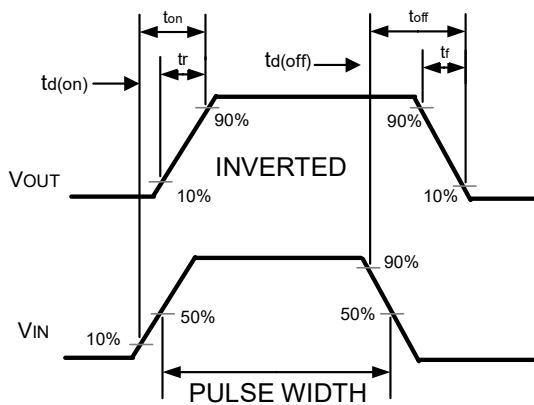
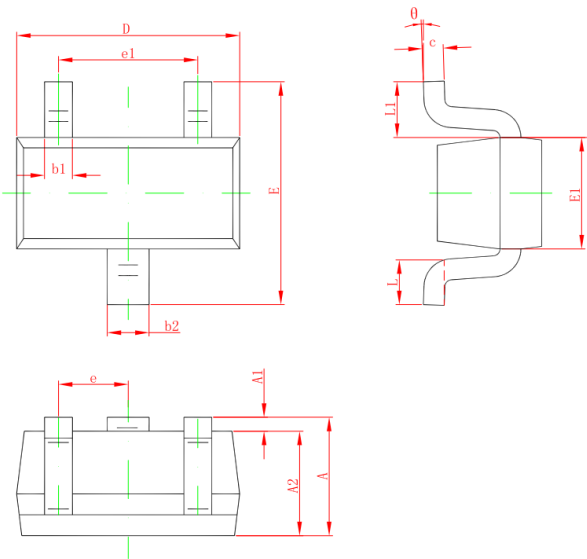


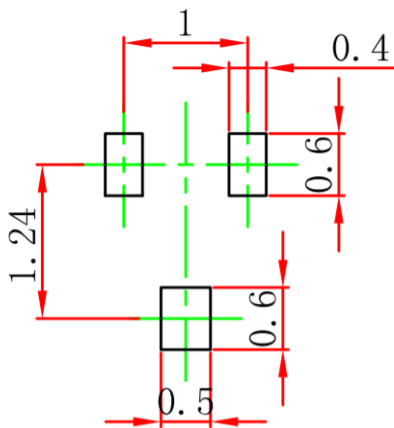
Figure 10. Switching wave

SOT-523 Package Outline Drawing



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	1.450	1.750	0.057	0.069
E1	0.700	0.900	0.028	0.035
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

Suggested Land Pattern



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