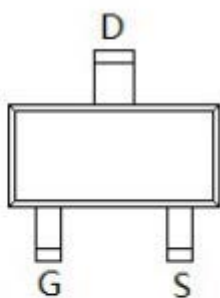
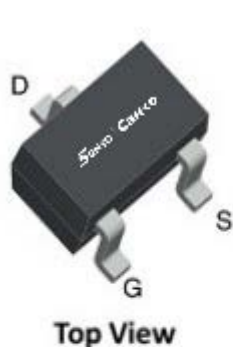
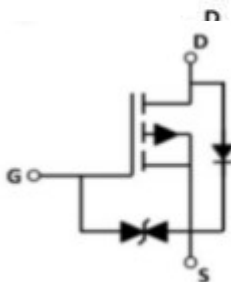


P-Channel Enhancement Mode Field Effect Transistor



SOT-523



Product Summary

- V_{DS} -20V
- I_D -0.5A
- $R_{DS(ON)}$ (at $V_{GS}=-4.5V$) <850 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-2.5V$) <1200 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-1.8V$) <2000 mohm
- ESD Protected Up to 2.0KV (HBM)

General Description

- Trench Power LV MOSFET technology
- High Density Cell Design for Low $R_{DS(ON)}$
- High Speed switching

Applications

- Interfacing, Logic switch
- Load switch
- Power management

■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		V_{DS}	-20	V
Gate-source Voltage		V_{GS}	± 12	V
Drain Current	$T_A=25^\circ\text{C}$ Steady State	I_D	-0.5	A
	$T_A=70^\circ\text{C}$ Steady State		-0.4	
Pulsed Drain Current ^A		I_{DM}	-2.6	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$ Steady State		P_D	0.18	W
Thermal Resistance Junction-to-Ambient @ Steady State ^B		$R_{\theta JA}$	694	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SCL3139KAE	F2	39A	3000	30000	120000	7" reel

■ Electrical Characteristics (T_J=25℃ 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℃			-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V		±1.5	±10	μA
		V _{GS} = ±8V, V _{DS} =0V		±500	±2000	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250μA	-0.35	-0.62	-1.2	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = -4.5V, I _D =-0.5A		580	850	mΩ
		V _{GS} = -2.5V, I _D =-0.3A		855	1200	
		V _{GS} = -1.8V, I _D =-0.2A		1350	2000	
Diode Forward Voltage	V _{SD}	I _S =-0.5A, V _{GS} =0V		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I _S				-0.5	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1MHZ		71		pF
Output Capacitance	C _{oss}			20		
Reverse Transfer Capacitance	C _{rss}			15		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-4.5V, V _{DD} =-10V, I _D =-0.5A		1.24		nC
Gate Source Charge	Q _{gs}			0.37		
Gate Drain Charge	Q _{gd}			0.27		
Reverse Recovery Chrage	Q _{rr}	I _F =-0.5A, di/dt=-20A/us		0.97		ns
Reverse Recovery Time	t _{rr}			26		
Turn-on Delay Time	t _{D(on)}	V _{GS} =-4.5V, V _{DD} =-10V, R _L =2.5Ω, 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		

- A. Pulse Test: Pulse Width≤300us, Duty cycle ≤2%.
 B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

■ Typical Performance Characteristics

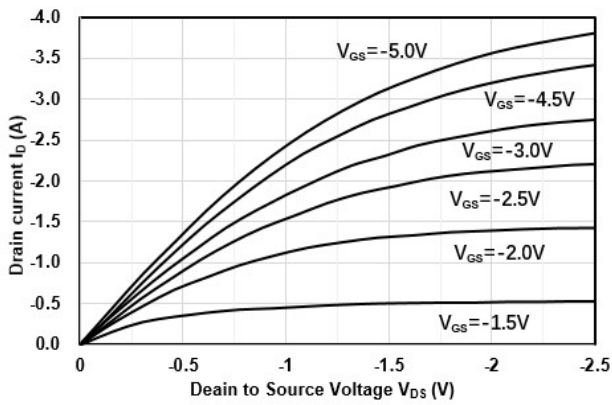


Figure1. Output Characteristics

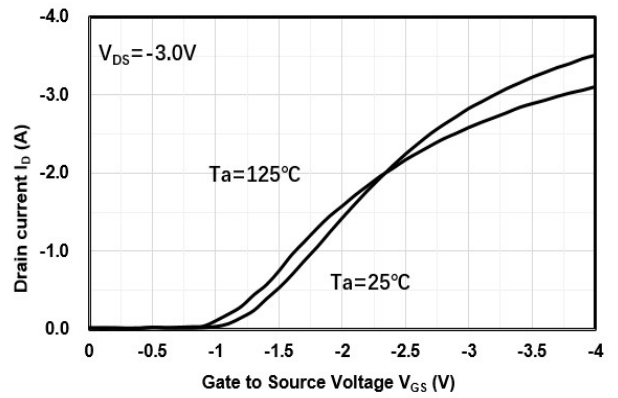


Figure2. Transfer Characteristics

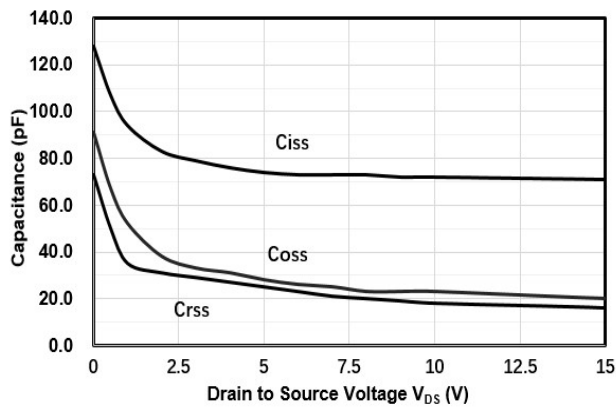


Figure3. Capacitance Characteristics

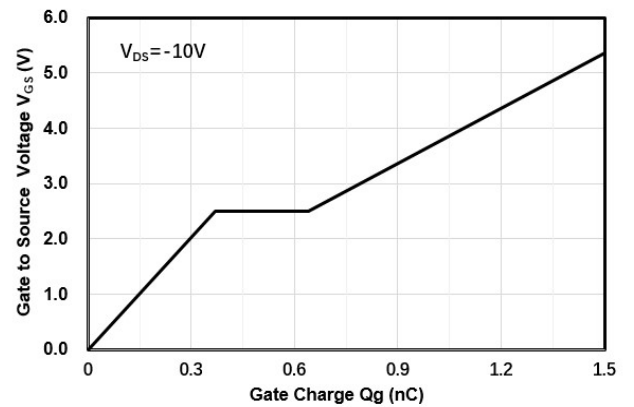


Figure4. Gate Charge

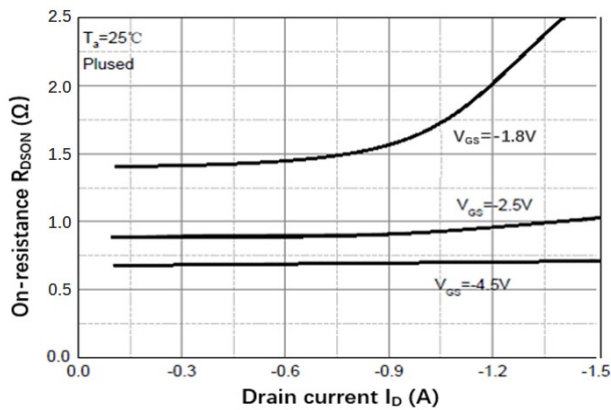


Figure5. Drain-Source on Resistance

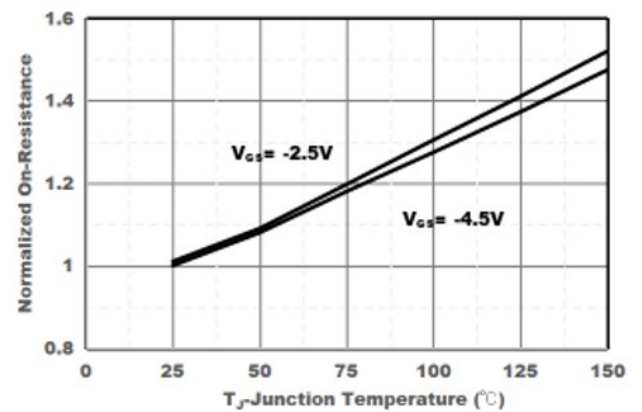


Figure6. Drain-Source on Resistance

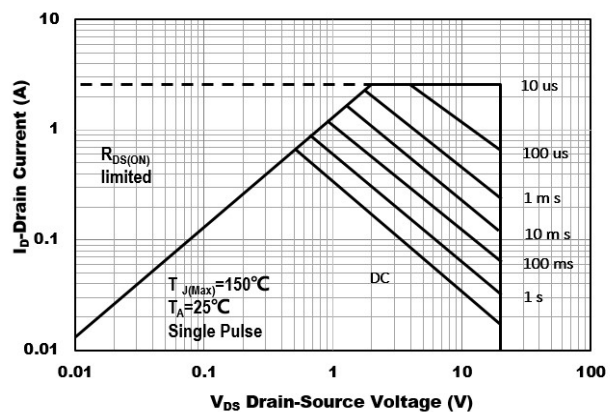


Figure7. Safe Operation Area

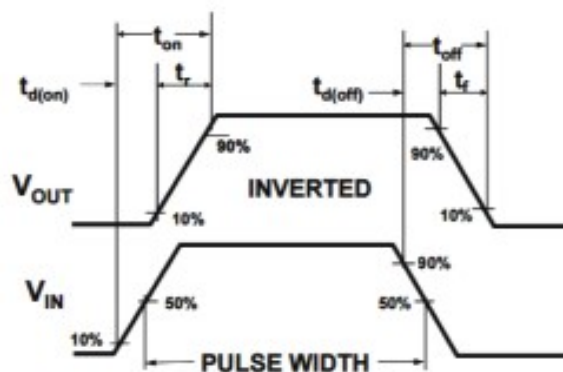
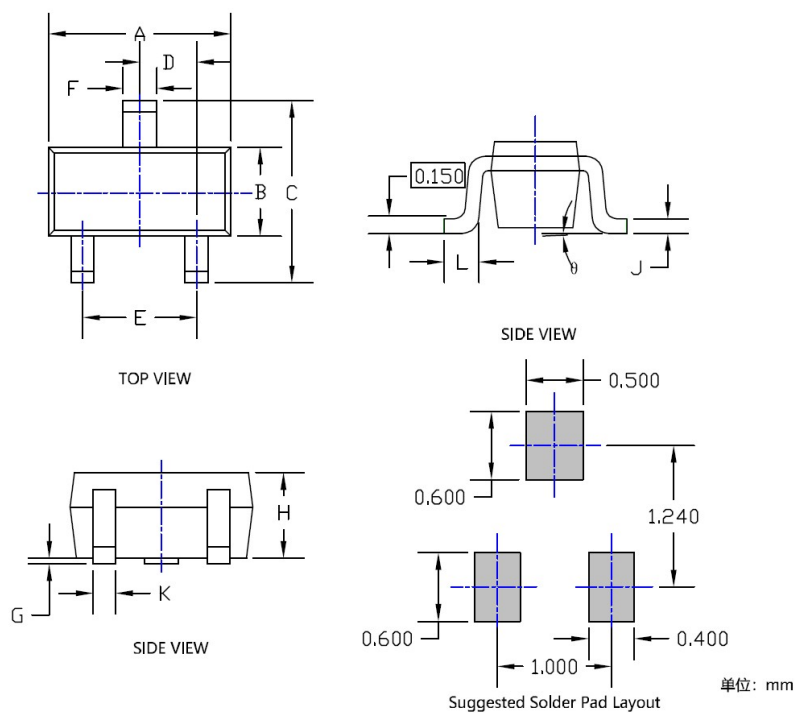


Figure8. Switching wave

■ SOT-523 Package information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.059	0.063	0.067	1.500	1.600	1.700
B	0.030	0.031	0.033	0.750	0.800	0.850
C	0.057	0.063	0.069	1.450	1.600	1.750
D	0.020TYP			0.500TYP		
E	0.035	0.039	0.043	0.900	1.000	1.100
F	0.010	0.014	0.018	0.250	0.350	0.450
G	0.000	---	0.004	0.000	---	0.100
H	0.024	0.028	0.031	0.600	0.700	0.800
J	0.004	---	0.008	0.100	---	0.200
K	0.006	0.010	0.014	0.150	0.250	0.350
L	0.010	---	0.018	0.260	---	0.460
θ	0°	---	8°	0°	---	8°

NOTE:
 1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
 2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
 3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

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