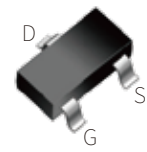
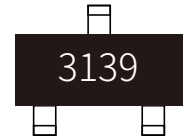


FEATURES

- | High Density Cell Design For Low $R_{DS(On)}$
- | Voltage Controlled Small Signal Switch
- | Rugged and Reliable
- | High Saturation Current Capability
- | Lead free product is acquired
- | ESD protected



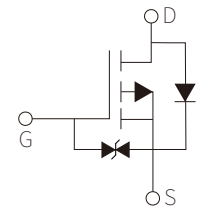
SOT-323



Marking

APPLICATION

- | Direct logic-level interface: TTL/CMOS
- | Drivers: relays, solenoids, lamps
- | hammers, display, memories, etc.
- | Battery operated systems
- | Solid-state relays



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	-1.5	A
Pulsed Drain Current ($t_p=10\mu\text{s}$)	I_{DM}	-3.0	A
Power Dissipation	P_D	0.38	W
Junction Temperature	T_J	-50- +150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-50- +150	$^{\circ}\text{C}$
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	431	$^{\circ}\text{C}/\text{W}$

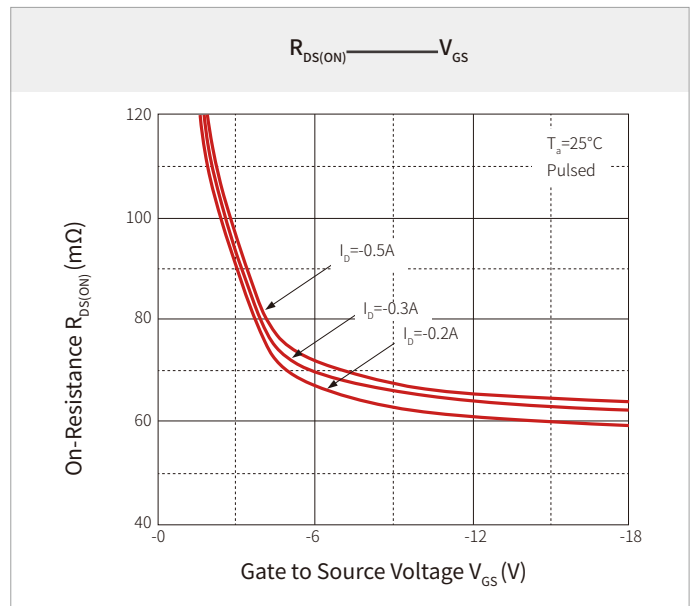
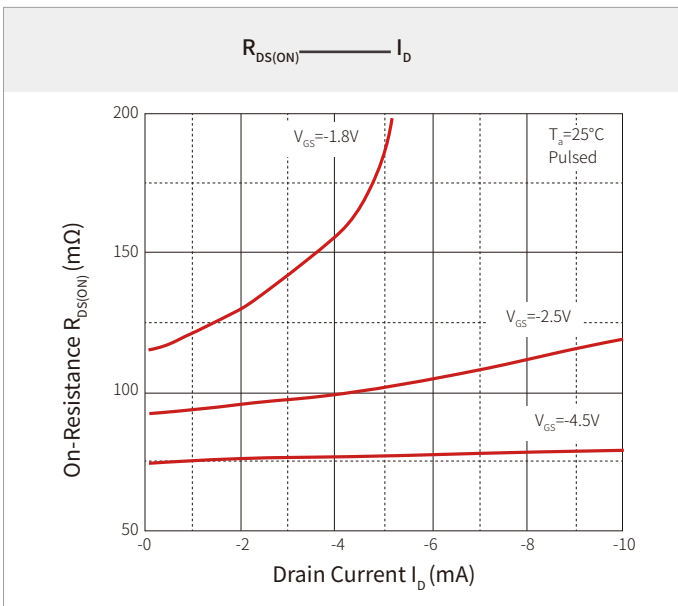
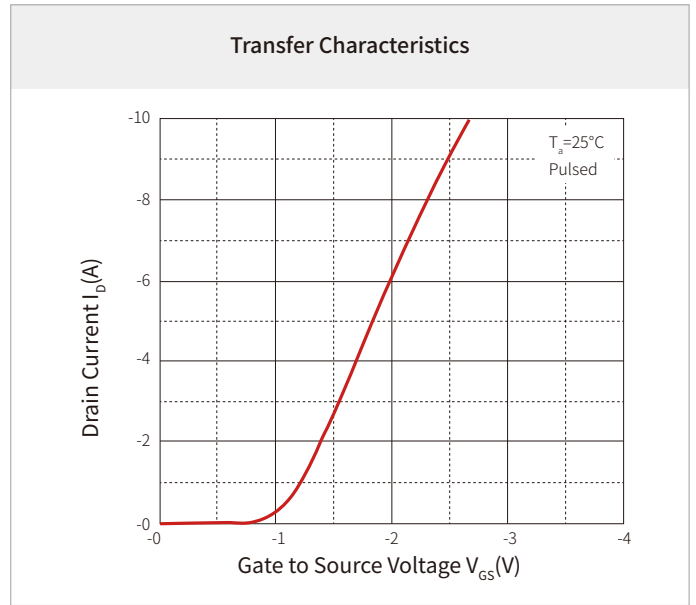
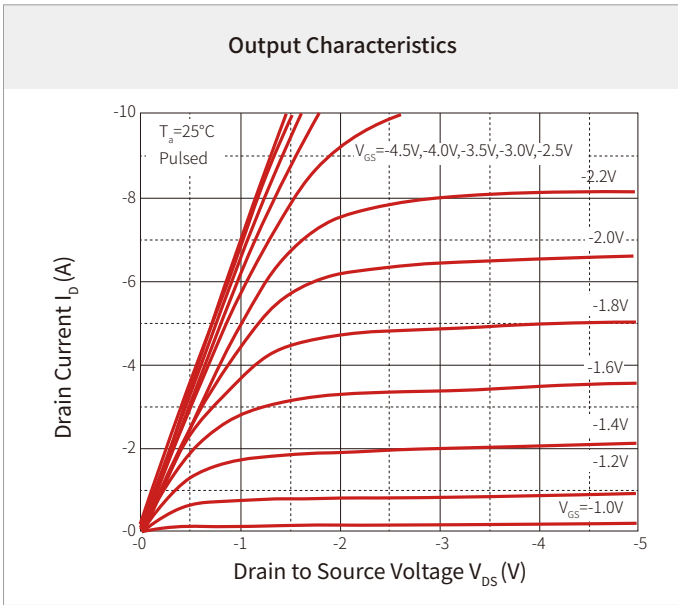
ELECTRICAL CHARACTERISTICS (T_A=25°C)

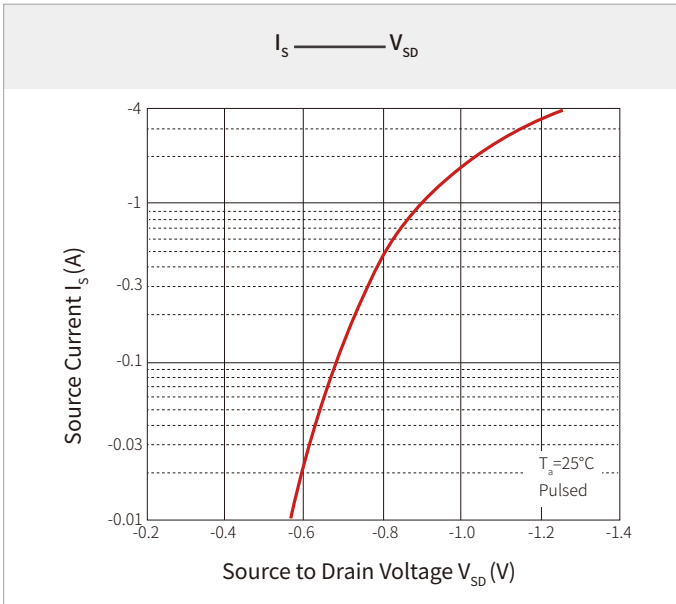
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250μA	-20			V
Gate-source leakage ^a	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±10	μA
Zero gate voltage drain current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Off Characteristics (Note 1)						
Gate-source threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.7	-1.0	V
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} =-4.5V, I _D =-0.5A		130	170	mΩ
		V _{GS} =-2.5V, I _D =-0.3A		180	235	mΩ
		V _{GS} =-1.8V, I _D =-0.2A		300	460	mΩ
Charges And Capacitances (Note 3)						
Input capacitance	C _{iss}	V _{DS} =-8.0V, V _{GS} =0V, f=1MHz		640		pF
Output capacitance	C _{oss}			120		pF
Reverse transfer capacitance	C _{rss}			82		pF
Switching Characteristics (Note 2,3)						
Total gate charge	Q _g	V _{DS} =-10V, V _{GS} =-2.5V, I _D =-3.0A		3.3	6	nC
Gate-source charge	Q _{gS}			0.7		nC
Gate-drain charge	Q _{gD}			1.3		nC
Turn-on delay time	t _{d(on)}	V _{GS} =-4.5V, V _{DD} =-4.0V, I _D =-1.0A, R _G =6.2Ω		6.2		ns
Rise Time	t _r			15		ns
Turn-Off Delay Time	t _{d(off)}			26		ns
Fall yime	t _f			18		ns
Drain-source Body Diode Characteristics						
Forward Diode Voltage	V _{SD}	V _{GS} =0V, I _S =-0.3A		-0.62	-1.2	V

Notes:

1. Pulse Test : pulse width ≤300μs, duty cycle ≤2%.
2. Switching characteristics are independent of operating junction temperatures.
3. These parameters have no way to verify.

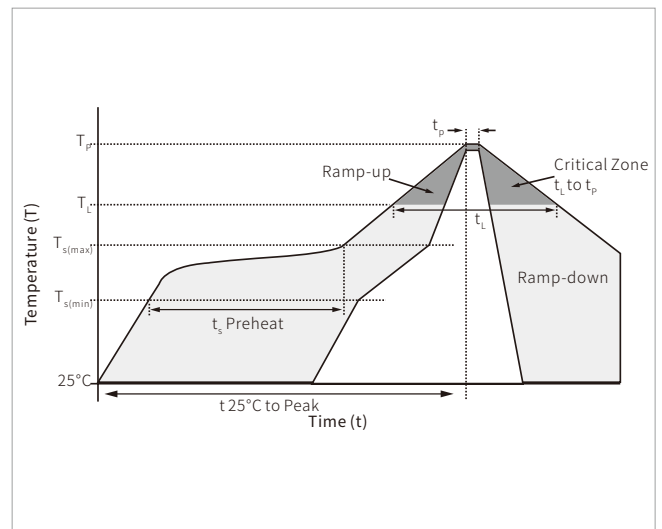
CHARACTERISTIC CURVES



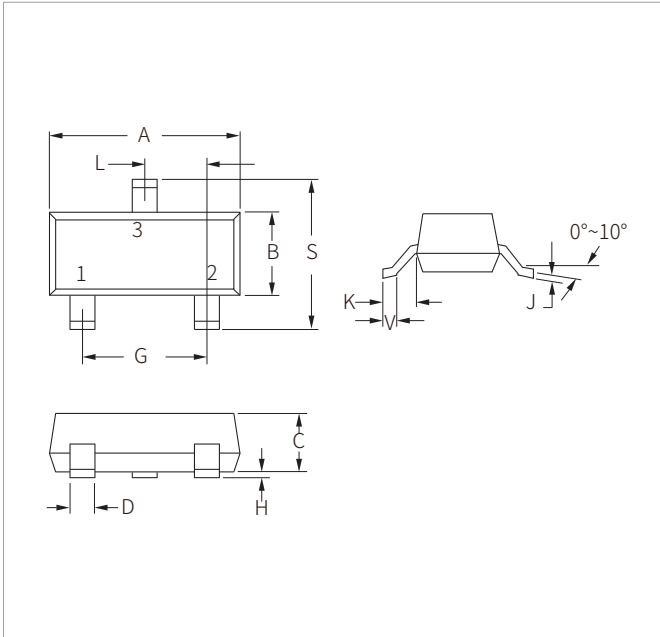


SOLDERING PARAMETERS

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ($T_{s(\min)}$)	150°C
	Temperature Max ($T_{s(\max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(\max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

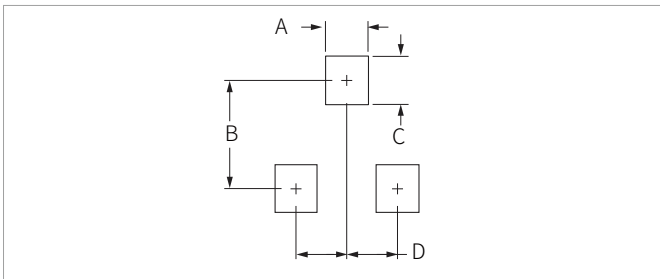


SOT-323 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.00	2.20	0.079	0.087
B	1.15	1.35	0.045	0.053
C	0.80	1.10	0.031	0.043
D	0.20	0.40	0.008	0.016
G	1.20	1.40	0.047	0.055
H	0.00	0.10	0.000	0.004
J	0.08	0.15	0.003	0.006
K	0.525REF		0.021REF	
L	0.650TYP		0.026TYP	
S	2.15	2.45	0.085	0.096
V	0.26	0.46	0.010	0.018

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters	Inches
	NOR	NOR
A	0.50	0.020
B	2.20	0.087
C	0.80	0.031
D	1.30	0.051

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPM3139W	SOT-323	3000PCS	7"

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By QR Code

Website



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