

Descriptions

This is -20V -0.7A P-Channel Enhancement Mode MOSFET in a SOT-523 plastic package.

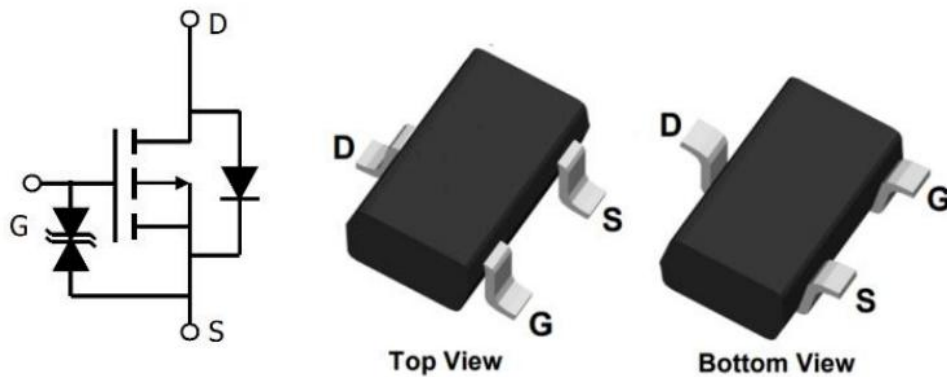
Features

- Advanced Trench Process Technology
- Low Threshold Voltage
- Fast Switching Speed
- Halogen-Free & Lead-Free
- Operated at Low Logic Level Gate Drive
- P-Channel Switch with Low $R_{DS(on)}$

Applications

- Load Switch for Portable Devices
- Voltage controlled small signal switch

Equivalent Circuit & Pinning



Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current	I _D	-0.7	A
Peak Drain Current, Pulsed ¹⁾	I _{DM}	-1.2	A
Power Dissipation	P _{tot}	0.19	W
Operating Junction	T _J	-55~ 150	°C
Storage Temperature Range	T _{stg}	-55~ 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient ²⁾	R _{θJA}	650	°C/W

Note:

- (1) Pulse width ≤100us, duty cycle ≤1%, limited by T_{jmax}.
- (2) Device mounted on FR-4 substrate PC board, 2ozcopper, with 1-inch square copper plate in still air.

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = -250 \mu A$	BV_{DSS}	-20			V
Drain-Source Leakage Current at $V_{DS} = -20 V, V_{GS} = 0 V$	I_{DSS}			-1	μA
Gate Leakage Current at $V_{GS} = \pm 10 V$	I_{GSS}			± 10	μA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}, I_D = -250 \mu A$	$V_{GS(th)}$	-0.35	-0.7	-1.1	V
Drain-Source On-State Resistance at $V_{GS} = -4.5 V, I_D = -500 m A$ at $V_{GS} = -2.5 V, I_D = -300 m A$	$R_{DS(on)}$		350 480	510 775	m Ω
DYNAMIC PARAMETERS					
Forward Transconductance at $V_{DS} = -10 V, I_D = -0.54 A$	g_{fs}		1.2		S
Input Capacitance at $V_{GS} = 0 V, V_{DS} = -16 V, f = 1 MHz$	C_{iss}		113		pF
Output Capacitance at $V_{GS} = 0 V, V_{DS} = -16 V, f = 1 MHz$	C_{oss}		15		pF
Reverse Transfer Capacitance at $V_{GS} = 0 V, V_{DS} = -16 V, f = 1 MHz$	C_{rss}		9		pF
Gate charge total at $V_{DS} = -10 V, I_D = -0.65 A, V_{GS} = -4.5 V$	Q_g		1.24		nC
Gate to Source Charge at $V_{DS} = -10 V, I_D = -0.65 A, V_{GS} = -4.5 V$	Q_{gs}		0.37		nC
Gate to Drain Charge at $V_{DS} = -10 V, I_D = -0.65 A, V_{GS} = -4.5 V$	Q_{gd}		0.27		nC
Turn-On Delay Time at $V_{GS} = -4.5 V, V_{DS} = -10 V, I_D = -0.2 A, R_{gen} = 10 \Omega$	$t_{d(on)}$		9		nS
Turn-On Rise Time at $V_{GS} = -4.5 V, V_{DS} = -10 V, I_D = -0.2 A, R_{gen} = 10 \Omega$	t_r		5.8		nS
Turn-Off Delay Time at $V_{GS} = -4.5 V, V_{DS} = -10 V, I_D = -0.2 A, R_{gen} = 10 \Omega$	$t_{d(off)}$		32.6		nS
Turn-Off Fall Time at $V_{GS} = -4.5 V, V_{DS} = -10 V, I_D = -0.2 A, R_{gen} = 10 \Omega$	t_f		20.3		nS
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = -0.5 A, V_{GS} = 0 V$	V_{SD}			-1.2	V
Body Diode Reverse Recovery Time at $I_F = -1.25 A, di/dt = 100 A / \mu s$	t_{rr}			10.2	nS
Body Diode Reverse Recovery Charge at $I_F = -1.25 A, di/dt = 100 A / \mu s$	Q_{rr}			3.5	nC

Electrical Characteristic Curve

Fig. 1 - Output Characteristics

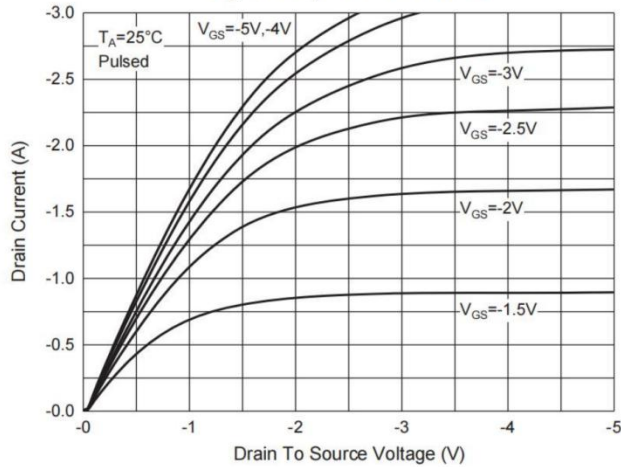


Fig. 2 - Transfer Characteristics

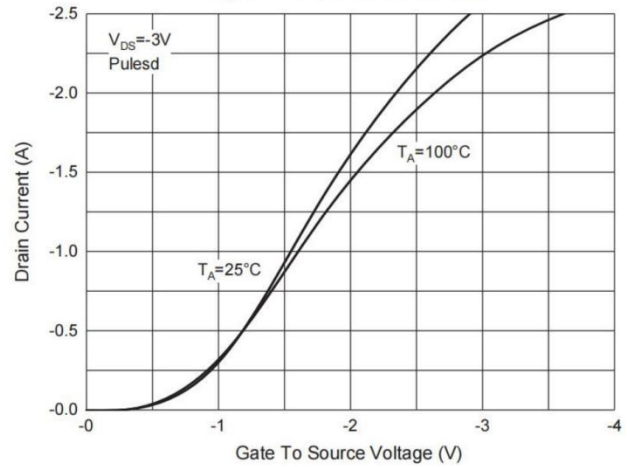
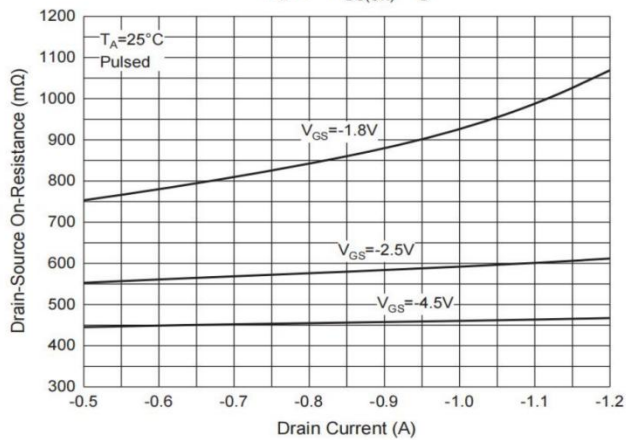
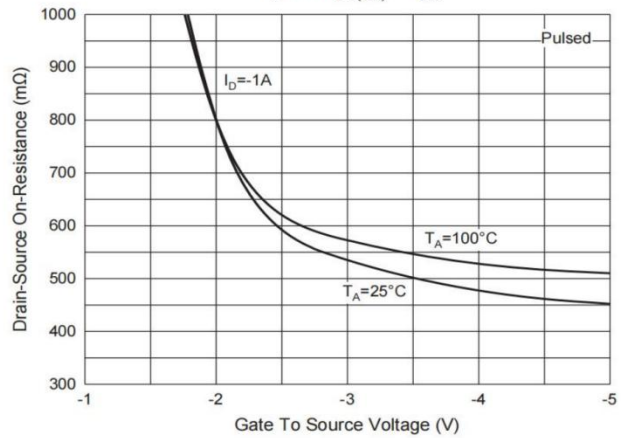
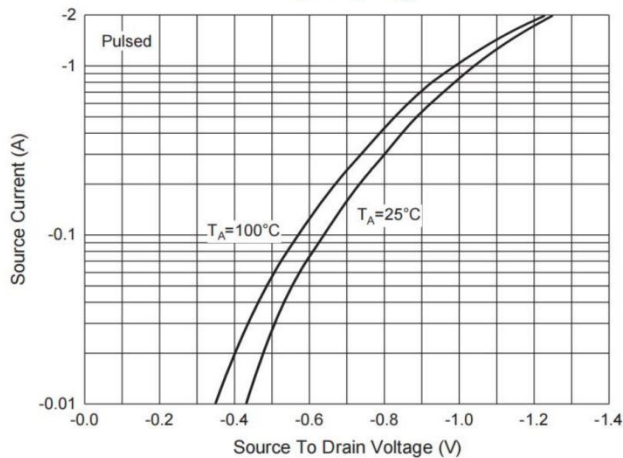
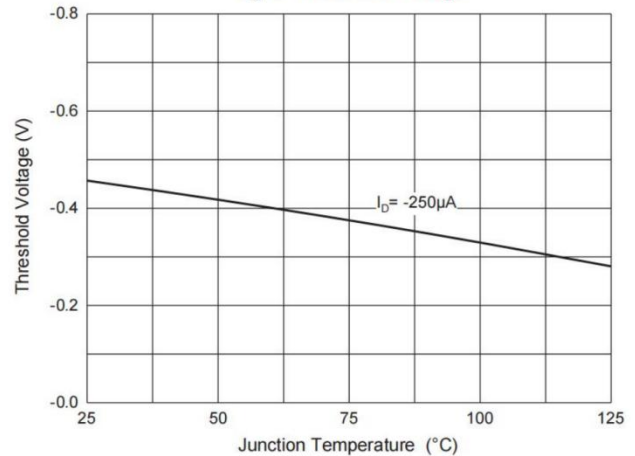
Fig. 3 - $R_{DS(ON)} - I_D$ Fig. 4 - $R_{DS(ON)} - V_{GS}$ Fig. 5 - $I_S - V_{SD}$ 

Fig. 6 - Threshold Voltage



Electrical Characteristic Curve

Fig.1-1 Switching times test circuit

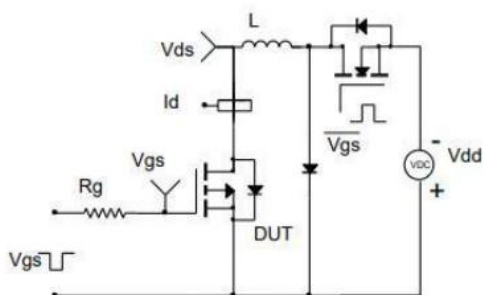


Fig.1-2 Switching Waveform

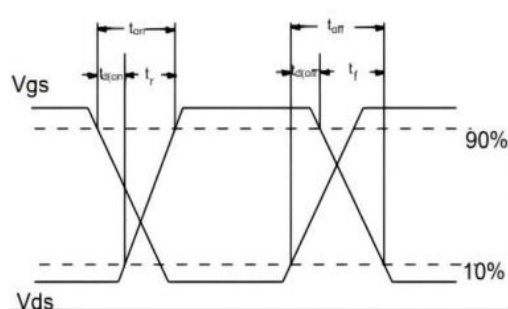


Fig.2-1 Gate charge test circuit

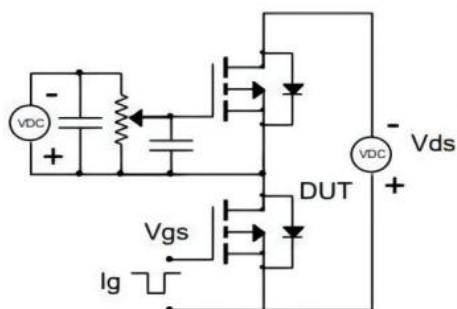


Fig.2-2 Gate charge waveform

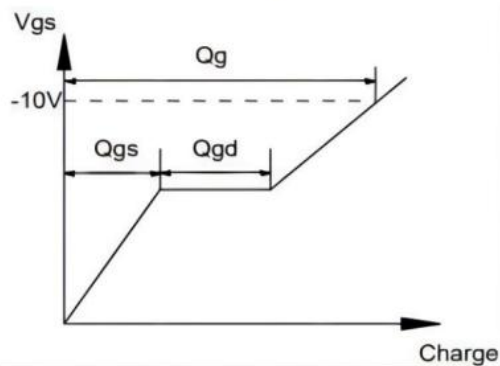


Fig.3-1 Avalanche test circuit

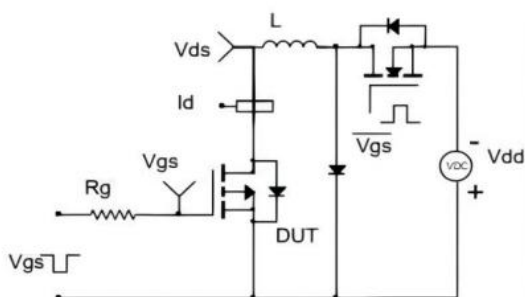
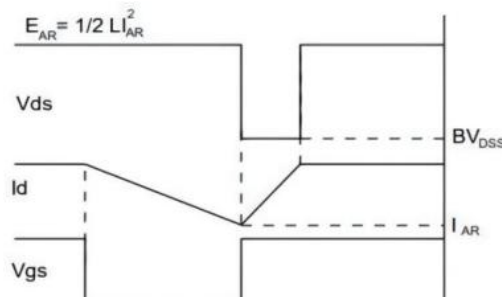
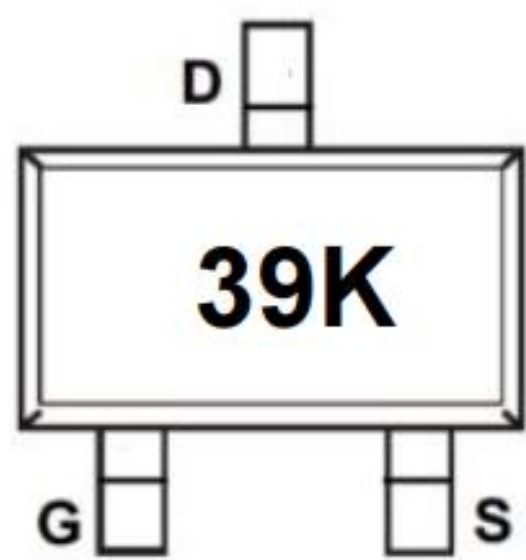


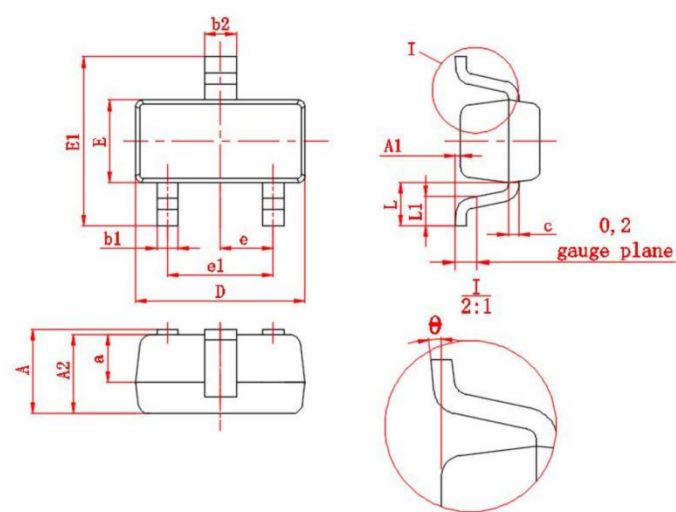
Fig.3-2 Avalanche waveform



Marking Instructions



Package Outline Dimensions



符号	尺寸		符号	尺寸		符号	尺寸	
	Min	Max		Min	Max		Min	Max
A	0.7	0.9	E	0.7	0.9	b2	0.25	0.35
A1	0	0.1	E1	1.45	1.75	c	0.08	0.15
A2	0.7	0.8	e	(0.5)		L	(0.4)	
a	(0.45)		e1	0.9	1.1	L1	0.2	0.4
D	1.5	1.7	b1	0.15	0.25	θ	0°	8°