

Descriptions

This 30V 5.8A N-channel enhancement mode field effect transistor in a SOT-23 plastic package.

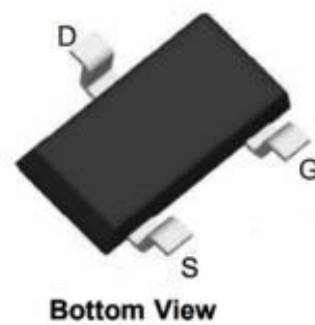
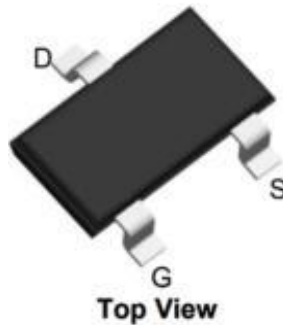
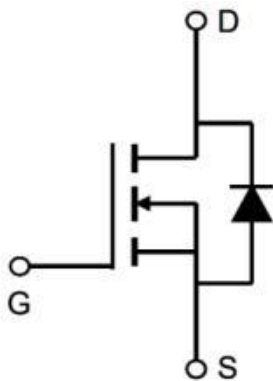
Features

- Advanced Trench Process Technology
- Low Threshold Voltage
- Fast Switching Speed
- Halogen-Free & Lead-Free

Application

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

Equivalent Circuit & Pinning



Marking

See Marking Instructions

Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current	I _D	5.8	A
Peak Drain Current, Pulsed ¹⁾	I _{DM}	30	A
Power Dissipation	P _{tot}	1.25	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}	100	°C/W

Note:

1) Pulse width ≤100us, duty cycle ≤1%, limited by T_{Jmax}.

2) Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Characteristics at Ta = 25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at ID = 250 μ A	BVDSS	30			V
Drain-Source Leakage Current at VDS = 30 V	IDSS			1	μ A
Gate Leakage Current at VGS = $\pm$ 12 V	IGSS			$\pm$ 100	nA
Gate-Source Threshold Voltage at VDS = VGS, ID = 250 μ A	VGS(th)	0.7		1.4	V
Drain-Source On-State Resistance at VGS = 10 V, ID = 5.8 A at VGS = 4.5 V, ID = 5 A	RDS(on)		27 29	35 40	m Ω
DYNAMIC PARAMETERS					
Gate resistance at VDS = 0 V, VGS = 0 V, f = 1 MHz	Rg			3.6	Ω
Forward Transconductance at VDS = 5 V, ID = 5 A	gfs	8			S
Input Capacitance at VGS = 0 V, VDS = 15 V, f = 1 MHz	Ciss			1050	pF
Output Capacitance at VGS = 0 V, VDS = 15 V, f = 1 MHz	Coss		99		pF
Reverse Transfer Capacitance at VGS = 0 V, VDS = 15 V, f = 1 MHz	Crss		77		pF
Gate charge total at VDS = 15 V, ID = 5.8 A, VGS = 4.5V	Qg		11		nC
Gate to Source Charge at VDS = 15 V, ID = 5.8 A, VGS = 4.5V	Qgs		1.6		nC
Gate to Drain Charge at VDS = 15 V, ID = 5.8 A, VGS = 4.5V	Qgd		2.8		nC
Turn-On Delay Time at VGS = 10 V, VDS = 15 V, RL = 2.7 Ω , Rgen = 3 Ω	td(on)			5	nS
Turn-On Rise Time at VGS = 10 V, VDS = 15 V, RL = 2.7 Ω , Rgen = 3 Ω	tr			7	nS
Turn-Off Delay Time at VGS = 10 V, VDS = 15 V, RL = 2.7 Ω , Rgen = 3 Ω	td(off)			40	nS
Turn-Off Fall Time at VGS = 10 V, VDS = 15 V, RL = 2.7 Ω , Rgen = 3 Ω	tf			6	nS
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at IS = 1 A, VGS = 0 V	VDS			1	V

Electrical Characteristics Curves

Fig. 1 - Output Characteristics

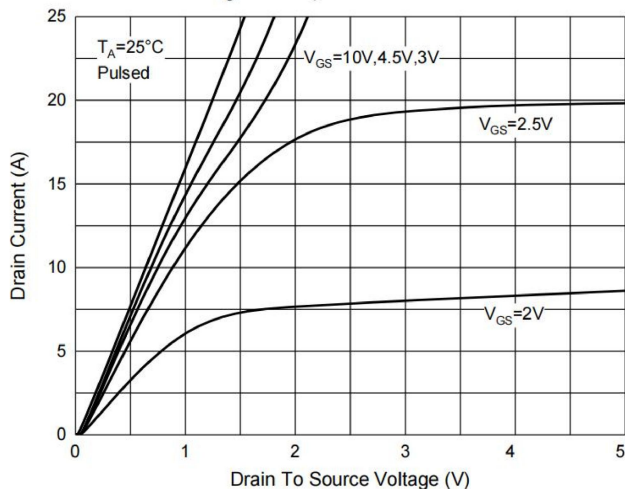


Fig. 2 - Transfer Characteristics

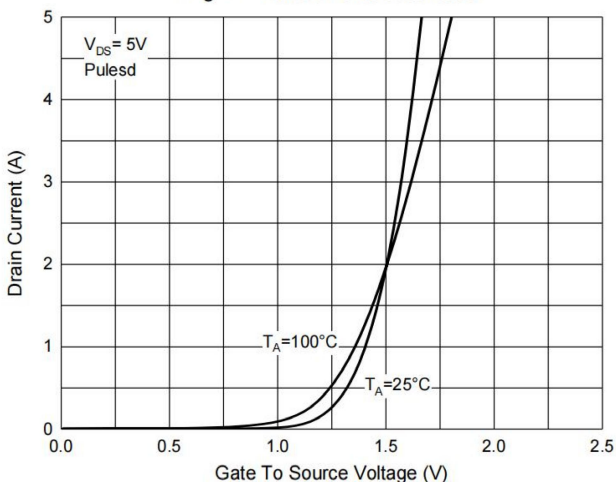


Fig. 3 - $R_{DS(ON)} - I_D$

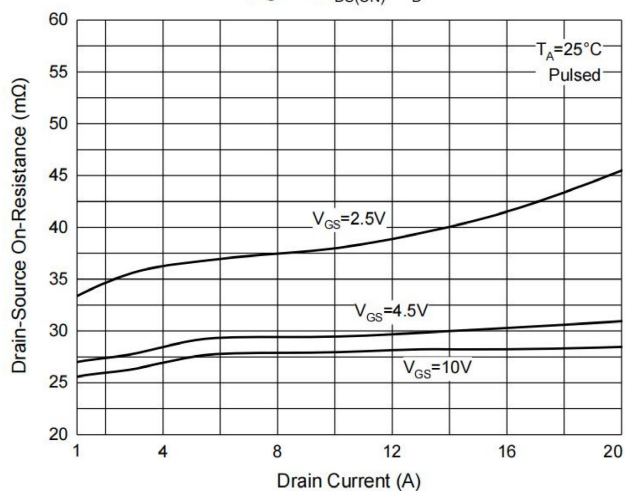


Fig. 4 - $R_{DS(ON)} - V_{GS}$

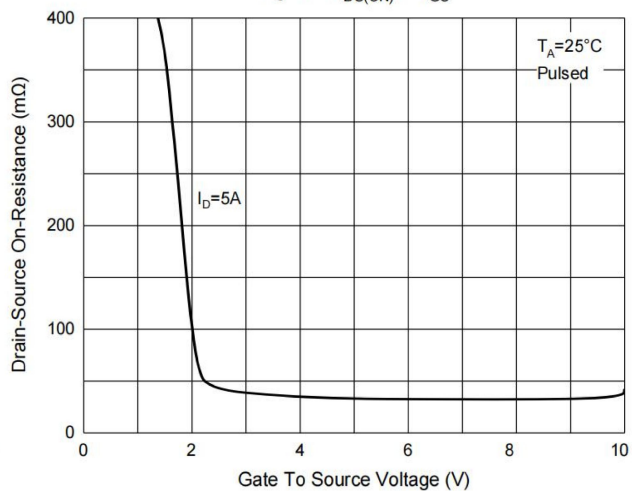


Fig. 5 - $I_S - V_{SD}$

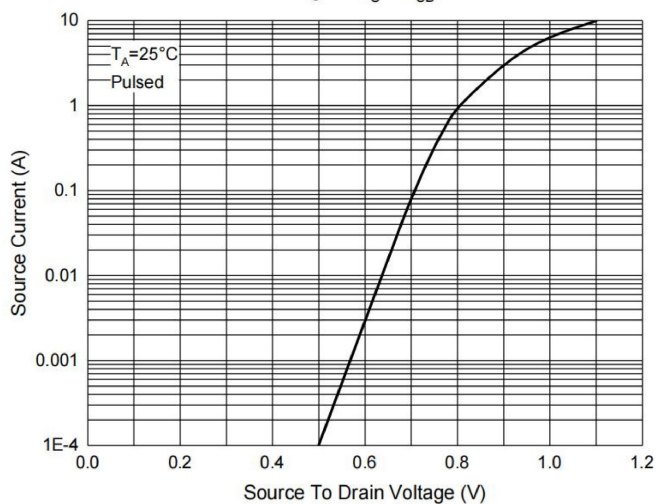
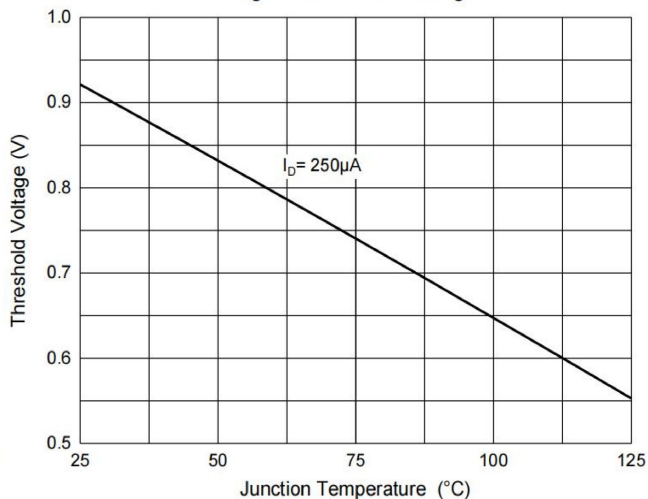


Fig. 6 - Threshold Voltage



Test Circuits

Fig.1-1 Switching times test circuit

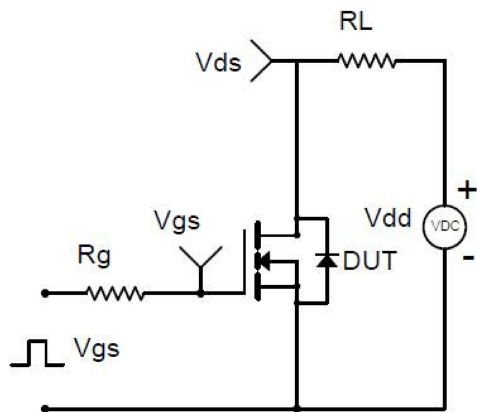


Fig.1-2 Switching Waveform

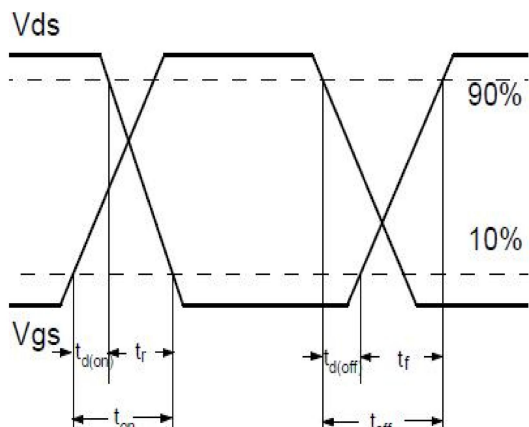


Fig.2-1 Gate charge test circuit

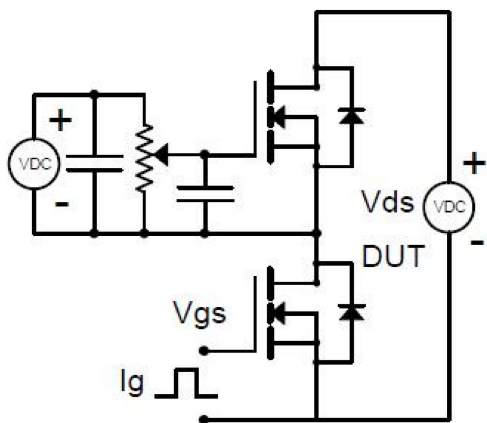


Fig.2-2 Gate charge waveform

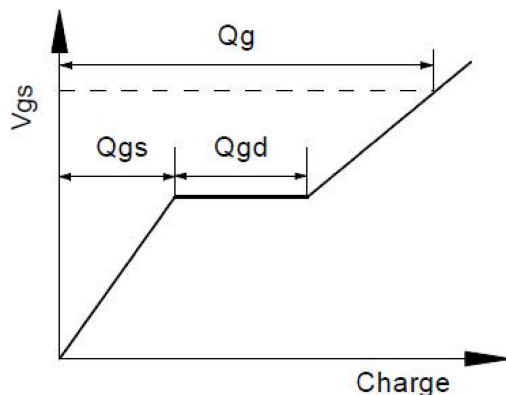


Fig.3-1 Avalanche test circuit

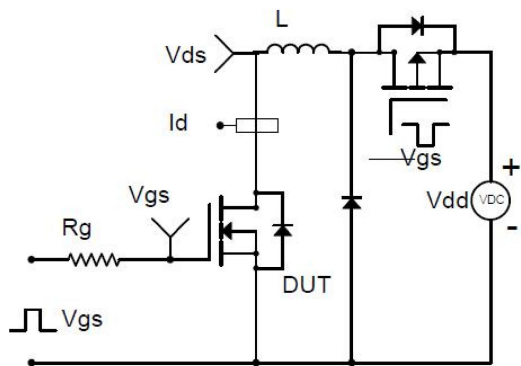
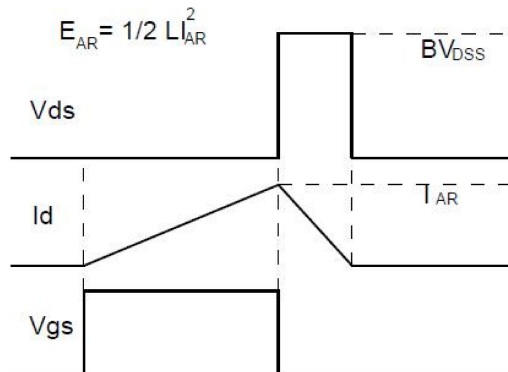
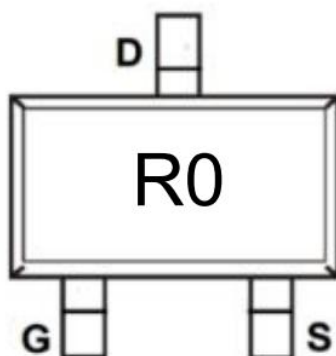


Fig.3-2 Avalanche waveform

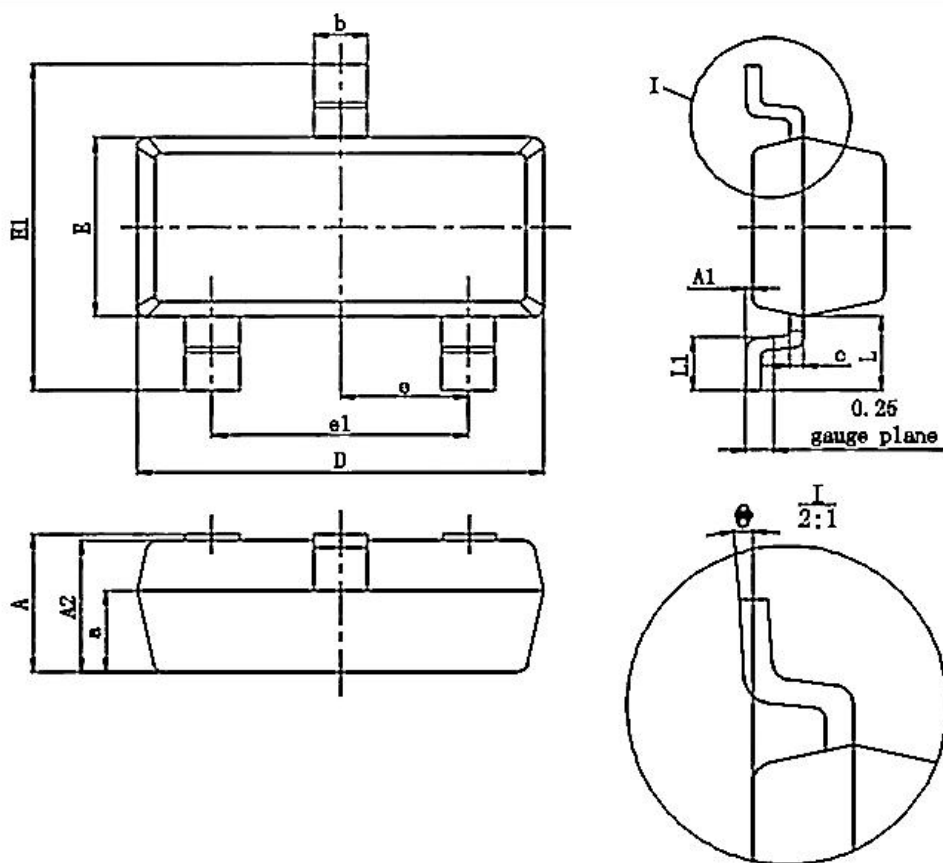


Marking information

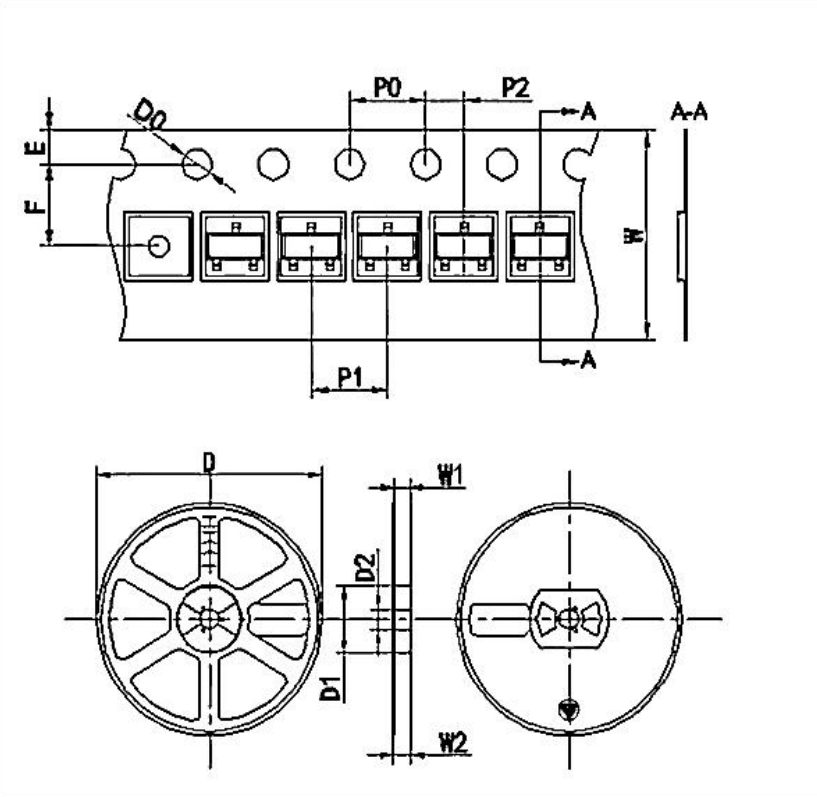


Marking: R0

Package Outline Dimensions (Units: mm)



Package Outline Dimensions (Units: mm)



Symbol	Dimension in Millimeters
Tape	
D0	1.50+0.10/-0.00
E	1.75±0.10
F	3.50±0.10
P0	4.00±0.10
P1	2.00±0.10
P2	2.00±0.10
W	8.00+0.3/-0.1
Reel	
D	178.0±2.00
D1	54.40±1.00
D2	13.00±1.00
W1	9.50±1.00
W2	12.30±1.00

Emboss Carrier Tape&Reel

符号	尺寸		符号	尺寸		符号	尺寸	
	Min	Max		Min	Max		Min	Max
A	0.9	1.15	E	1.2	1.4	c	0.08	0.15
A1	0	0.1	E1	2.25	2.55	L	(0.55)	
A2	0.9	1.05	e	(0.95)		L1	0.3	0.5
a	(0.6)		e1	1.8	2.0	θ	0°	8°
D	2.8	3.0	b	0.3	0.5			