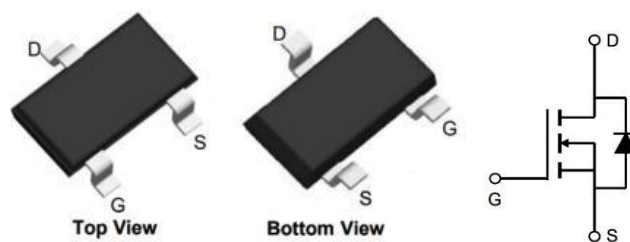


N-Channel Enhancement Mode MOSFET

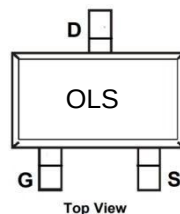
Features

- $V_{DS} = 30V$
- $I_D = 4A$
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) $= 40m\Omega$ (Typ)
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) $= 45m\Omega$ (Typ)



Application

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



SOT-323

Absolute Maximum Ratings (at $T_a = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ¹⁾	I_D	4	A
Peak Drain Current, Pulsed ²⁾	I_{DM}	16.4	A
Power Dissipation ¹⁾	P_{tot}	1.25	W
Operating Junction	T_J	-55~150	$^\circ C$
Storage Temperature Range	T_{stg}	-55~150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Lead	$R_{\theta JL}$	19.7	$^\circ C/W$
Thermal Resistance from Junction to Ambient ¹⁾	$R_{\theta JA}$	336	$^\circ C/W$

Note:

¹⁾ For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

²⁾ Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.02$, pulse width 300 μs - pulse width limited by maximum junction temperature.

Characteristics at Ta = 25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $V_{GS}=0V$, $I_D=250\mu A$	BV_{DSS}	30			V
Drain-Source Leakage Current at $V_{DS}=30V$, $V_{GS}=0V$	I_{DSS}			1	μA
Gate Leakage Current at $V_{DS}=0V$, $V_{GS}=\pm 12V$	I_{GSS}			± 100	nA
Gate-Source Threshold Voltage at $V_{DS}=V_{GS}$, $I_D=250\mu A$	$V_{GS(th)}$	0.6		1.3	V
Drain-Source On-State Resistance at $V_{GS}=10V$, $I_D=4A$ at $V_{GS}=4.5V$, $I_D=3A$	$R_{DS(on)}$		40 45	48 54	m Ω
DYNAMIC PARAMETERS					
Forward Transconductance at $V_{DS}=5V$, $I_D=4A$	g_{fs}		6		S
Input Capacitance at $V_{DS}=30V$, $V_{GS}=5V$, $f=1MHz$	C_{iss}		389		pF
Output Capacitance at $V_{DS}=30V$, $V_{GS}=5V$, $f=1MHz$	C_{oss}		54		pF
Reverse Transfer Capacitance at $V_{DS}=30V$, $V_{GS}=5V$, $f=1MHz$	C_{rss}		40		pF
Gate charge total at $V_{DS}=30V$, $I_D=4A$, $V_{GS}=10V$	Q_g		4.4		nC
Gate to Source Charge at $V_{DS}=30V$, $I_D=4A$, $V_{GS}=10V$	Q_{gs}		0.7		nC
Gate to Drain Charge at at $V_{DS}=30V$, $I_D=4A$, $V_{GS}=10V$	Q_{gd}		1.3		nC
Turn-On Delay Time at $V_{DD}=30V$, $I_D=1.2A$, $R_G=6\Omega$, $V_{GS}=10V$	$t_{d(on)}$		10		nS
Turn-On Rise Time at $V_{DD}=30V$, $I_D=1.2A$, $R_G=6\Omega$, $V_{GS}=10V$	t_r		23		ns
Turn-Off Delay Time at $V_{DD}=30V$, $I_D=1.2A$, $R_G=6\Omega$, $V_{GS}=10V$	$t_{d(off)}$		34		nS
Turn-Off Fall Time at $V_{DD}=30V$, $I_D=1.2A$, $R_G=6\Omega$, $V_{GS}=10V$	t_f		4.6		ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S=1A$, $V_{GS}=0V$	V_{SD}			1	V
Body Diode Reverse Recovery Time at $I_S=3A$, $di/dt=100A/\mu s$	t_{rr}		1.3		nS
Body Diode Reverse Recovery Charge at $I_S=3A$, $di/dt=100A/\mu s$	Q_{rr}		6.2		nC

Electrical Characteristics Curves

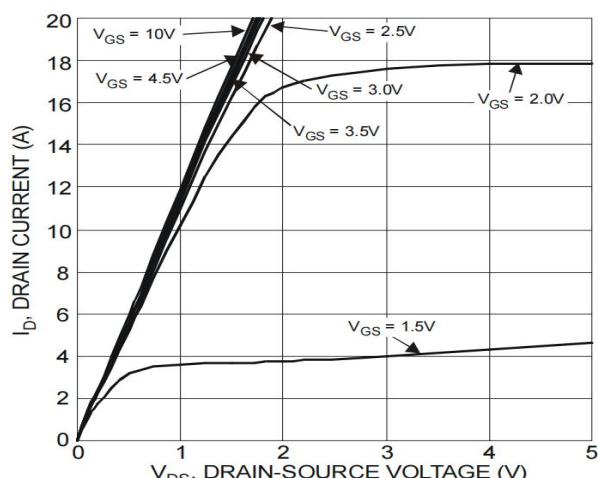


Figure 1 Typical Output Characteristics

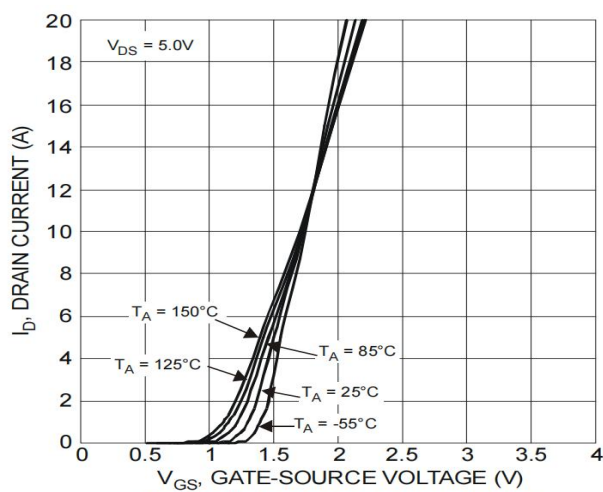


Figure 2 Typical Transfer Characteristics

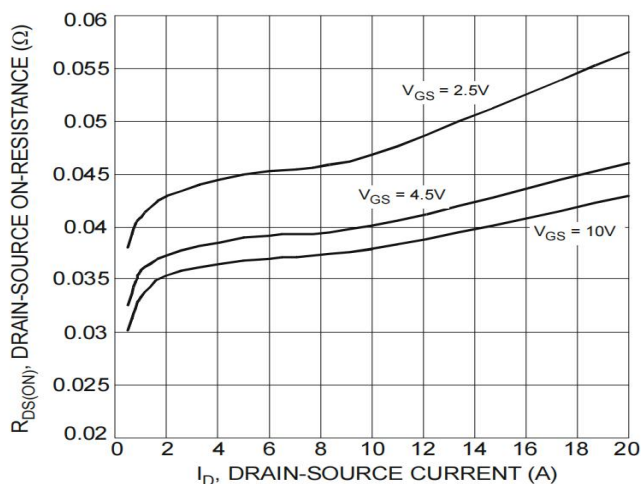


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

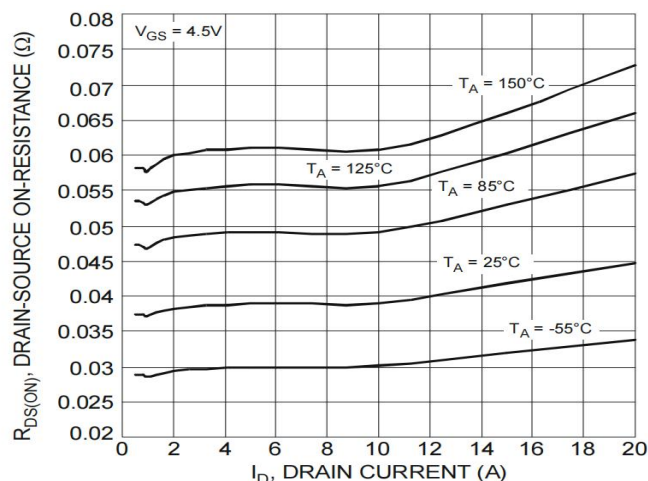


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

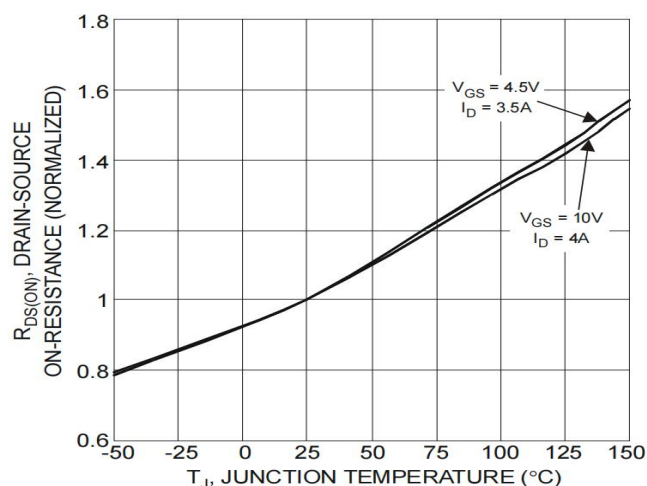


Figure 5 On-Resistance Variation with Temperature

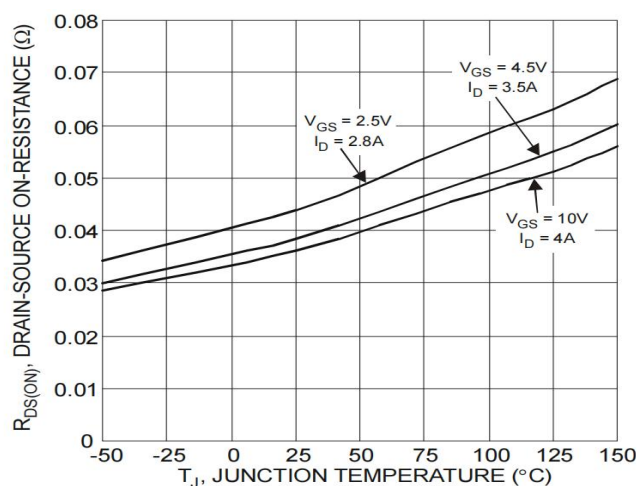


Figure 6 On-Resistance Variation with Temperature

Electrical Characteristics Curves

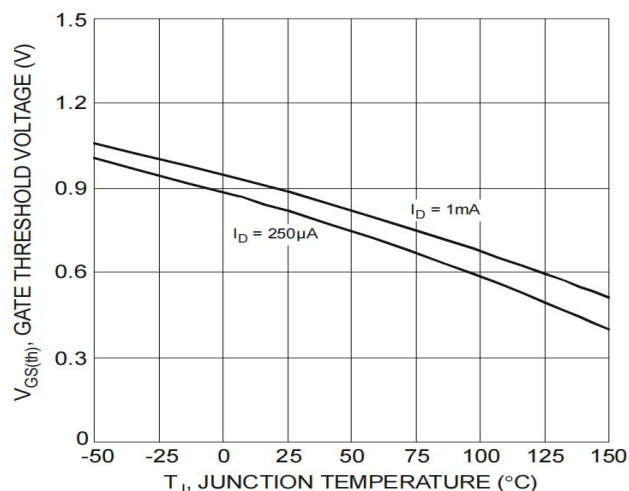


Figure 7 Gate Threshold Variation vs. Ambient Temperature

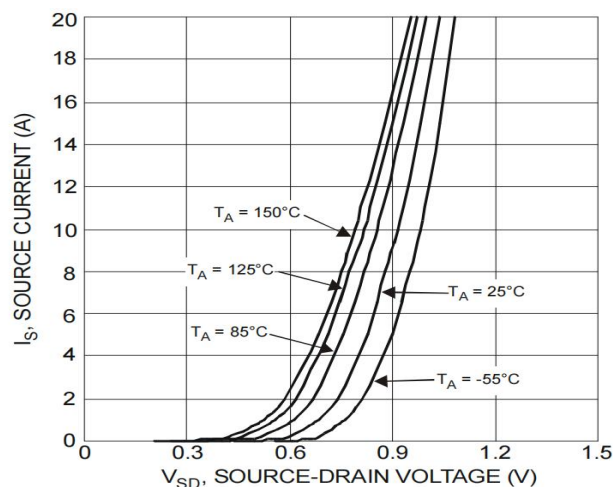


Figure 8 Diode Forward Voltage vs. Current

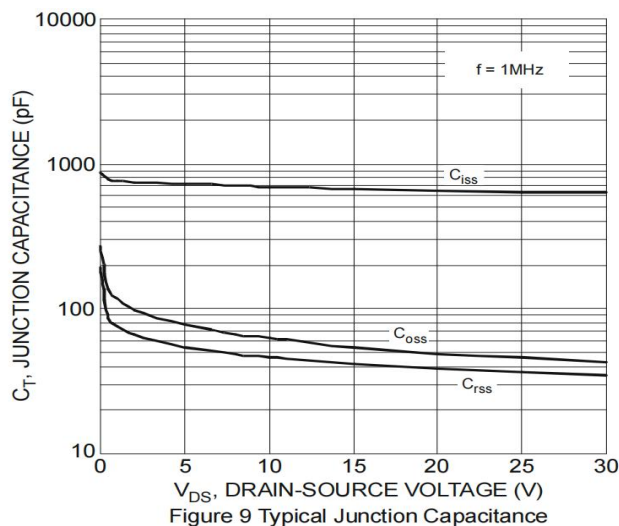


Figure 9 Typical Junction Capacitance

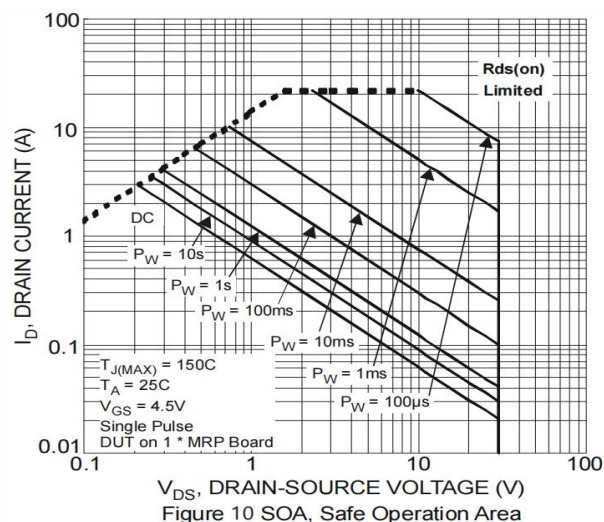


Figure 10 SOA, Safe Operation Area

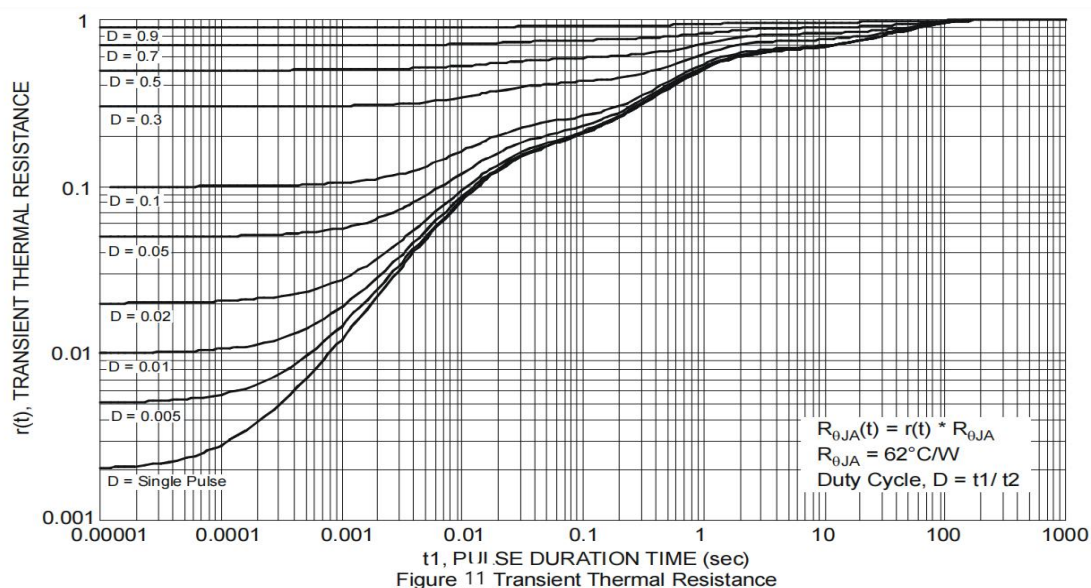


Figure 11 Transient Thermal Resistance

Test Circuits

Fig.1-1 Switching times test circuit

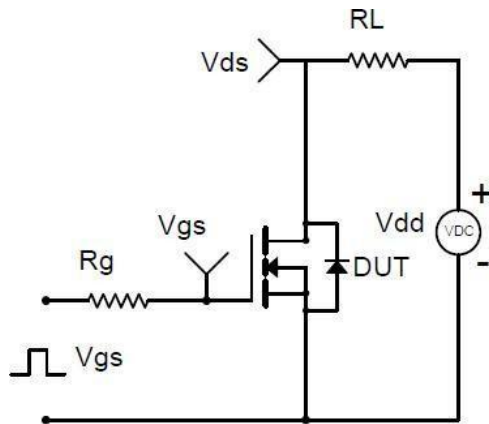


Fig.1-2 Switching Waveform

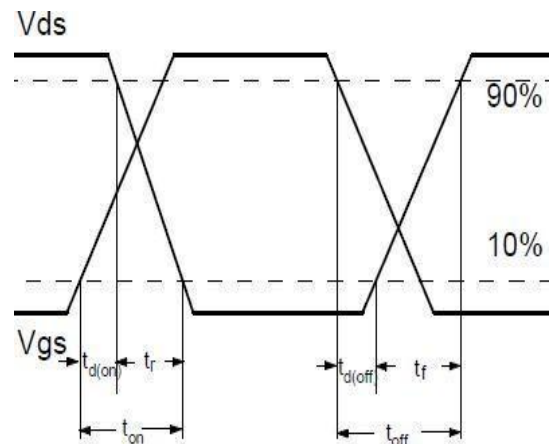


Fig.2-1 Gate charge test circuit

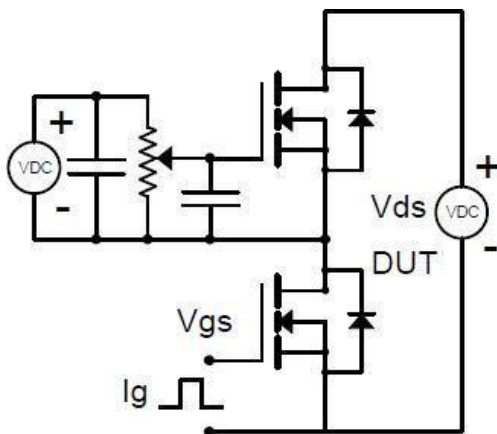


Fig.2-2 Gate charge waveform

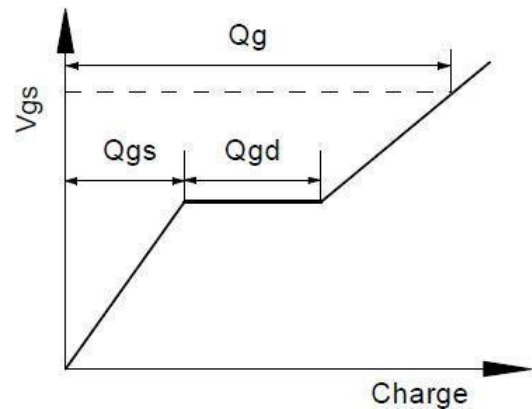


Fig.3-1 Avalanche test circuit

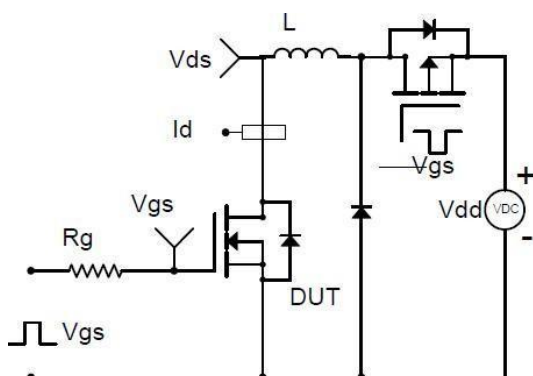
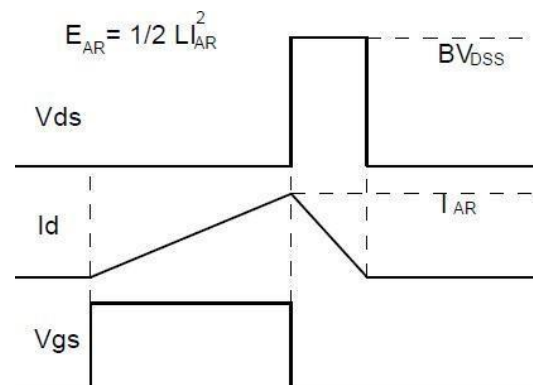
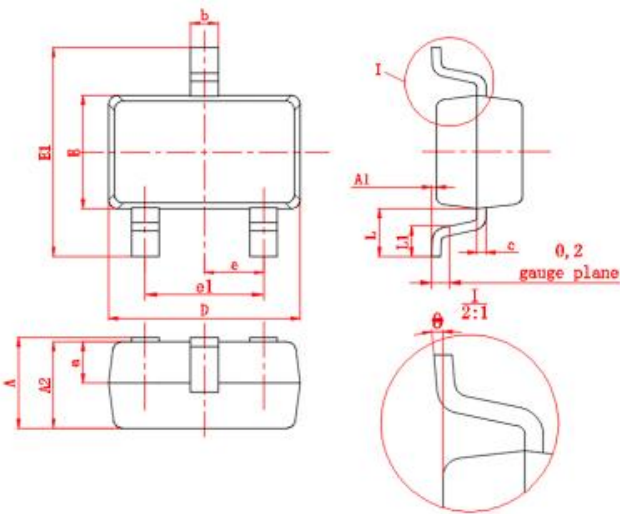


Fig.3-2 Avalanche waveform





符号	尺寸		符号	尺寸		符号	尺寸	
	Min	Max		Min	Max		Min	Max
A	0.9	1.1	E	1.15	1.35	L1	0.26	0.46
A1	0	0.1	E1	2.15	2.45	b	0.25	0.35
A2	0.9	1.0	e	(0.65)		c	0.08	0.15
D	2.0	2.2	e1	1.2	1.4	θ	0°	8°
a	(0.45)		L	(0.525)				