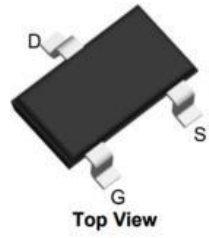
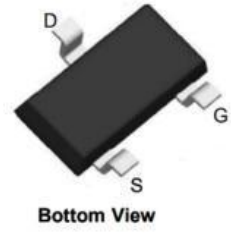
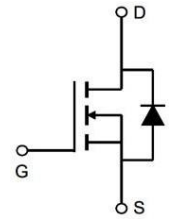
N-Channel Enhancement Mode

Features

- VDS= 30V,
- ID= 4A
- RDS(ON) (at VGS= 10V) =40mΩ（Typ)
- RDS(ON) (at VGS= 4.5V) =45mΩ（Typ)

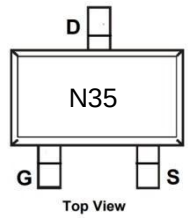






Application

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



SOT-323

Absolute Maximum Ratings (at Ta = 25°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	℃
Storage Temperature Range	T_{stg}	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Lead	$R_{\theta JL}$	19.7	℃/W
Thermal Resistance from Junction to Ambient [1)]	$R_{\theta JA}$	100	℃/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 μ s - pulse width limited by maximum junction temperature.

Characteristics at Ta = 25℃ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at V_{GS}=0V, I_D=250μA	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} = ±12V	I_{GSS}			±100	nA
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(th)}$	0.6		1.3	V
Drain-Source On-State Resistance at V_{GS} = 10 V, I_D = 4A at V_{GS} = 4.5V, I_D =3A	$R_{DS(on)}$		40 45	48 54	mΩ
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} =30 V, I_D =4A, V_{GS} = 10V	Qg		4.4		nC
Gate to Source Charge at V_{DS} =30 V, I_D =4A, V_{GS} =10 V	Q_{gs}		0.7		nC
Gate to Drain Chargeat at V_{DS} =30 V, I_D =4A, V_{GS} =10 V	Q_{gd}		1.3		nC
Turn-On Delay Time at V_{DD}=30V,I_D =1.2A,R_G=6 Ω,V_{GS}=10V	$t_{d(on)}$		10		nS
Turn-On Rise Time at V_{DD}=30V,I_D =1.2A,R_G=6 Ω,V_{GS}=10V	t_r		23		ns
Turn-Off Delay Time at V_{DD}=30V,I_D =1.2A,R_G=6 Ω,V_{GS}=10V	$t_{d(off)}$		34		nS
Turn-Off Fall Time at V_{DD}=30V,I_D =1.2A,R_G=6 Ω,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 = 100 A / μs	trr		1.3		nS
Body Diode Reverse Recovery Charge at I_S =3A, di/dt = 100 A / μs	Qrr		6.2		nC

Electrical Characteristics Curves

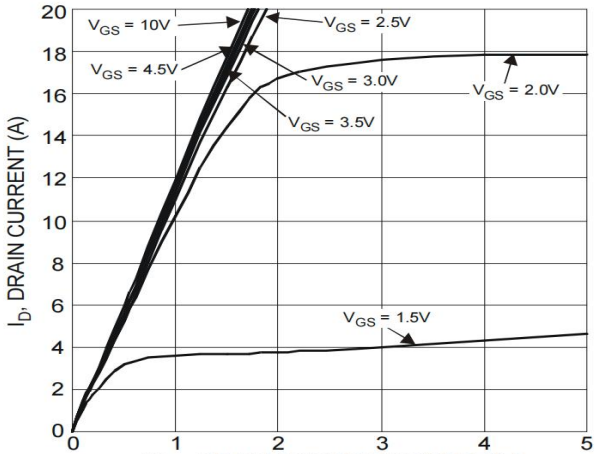


Figure 1 Typical Output Characteristics

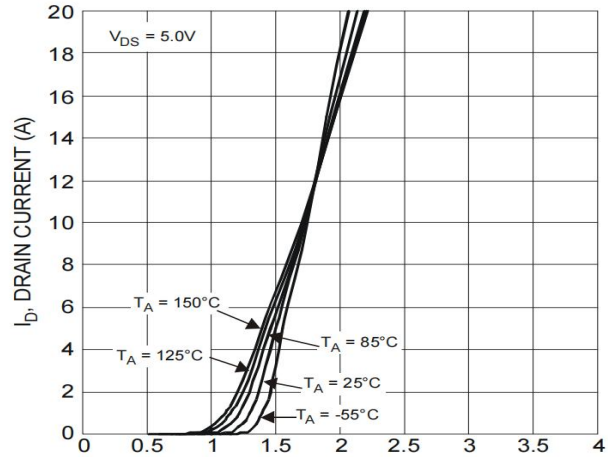


Figure 2 Typical Transfer Characteristics

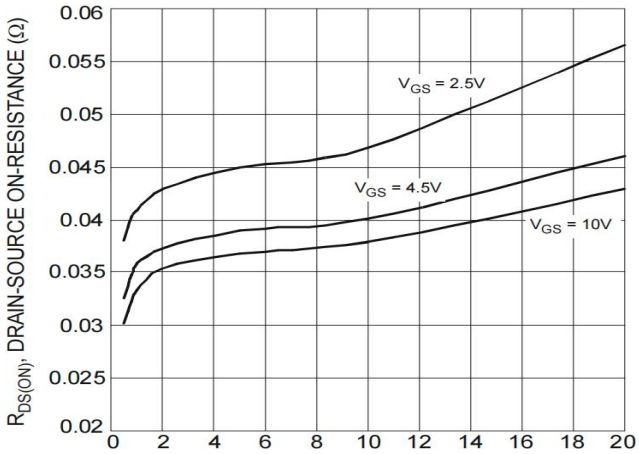


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

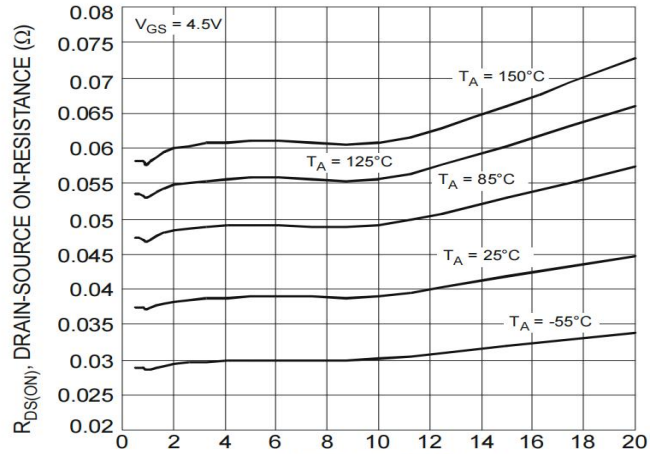


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

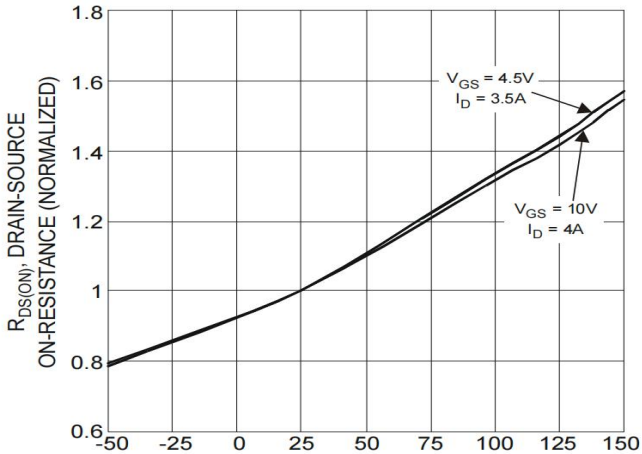


Figure 5 On-Resistance Variation with Temperature

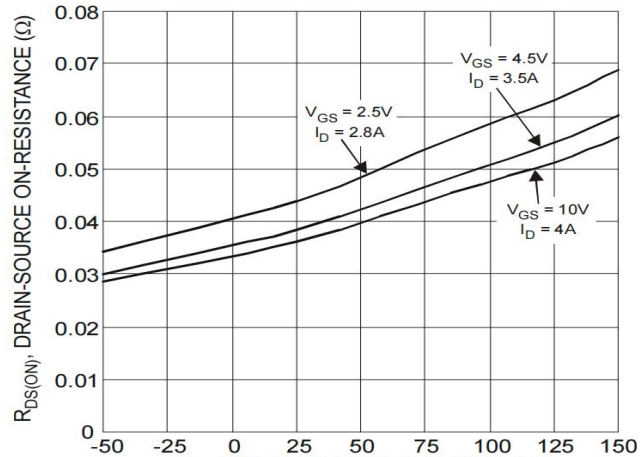


Figure 6 On-Resistance Variation with Temperature

Electrical Characteristics Curves

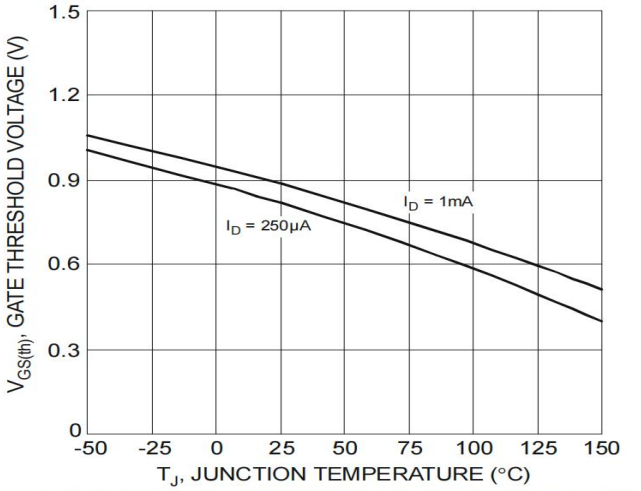


Figure 7 Gate Threshold Variation vs. Ambient Temperature

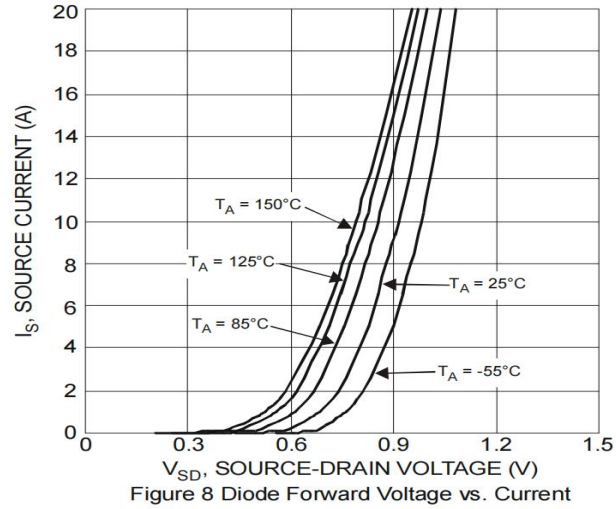


Figure 8 Diode Forward Voltage vs. Current

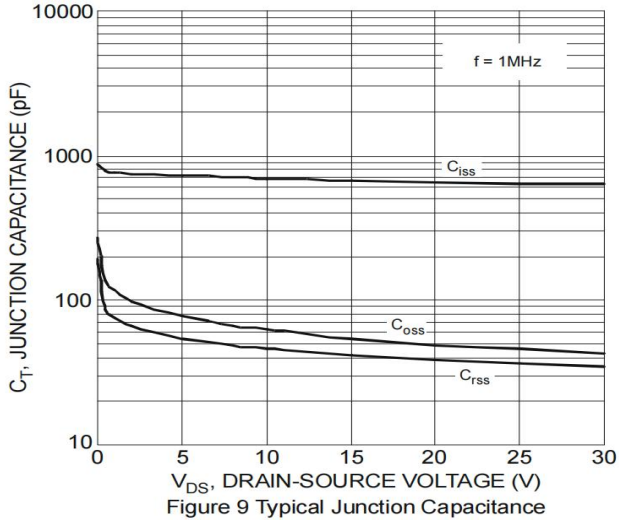


Figure 9 Typical Junction Capacitance

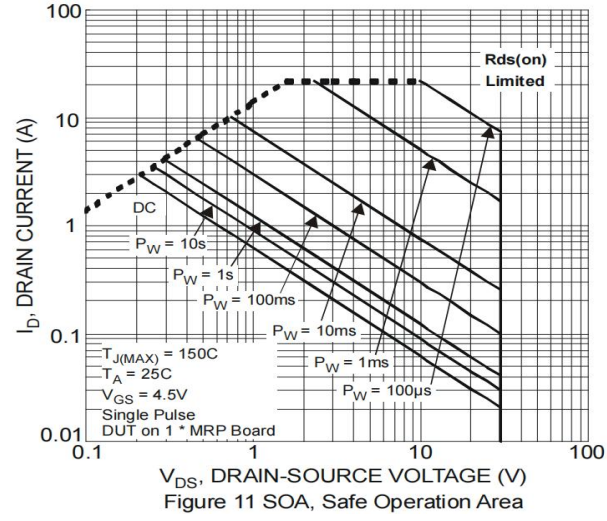


Figure 11 SOA, Safe Operation Area

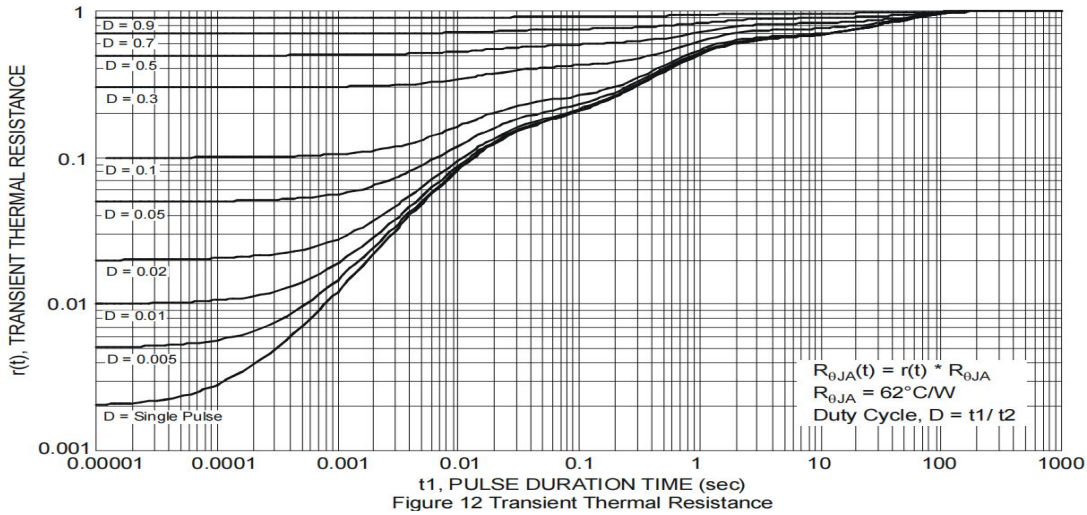


Figure 12 Transient Thermal Resistance

Test Circuits

Fig.1-1 Switching times test circuit

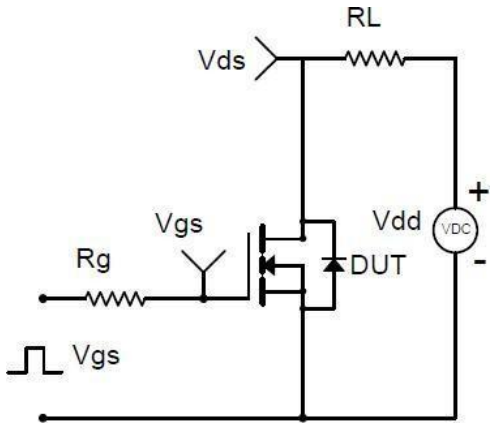


Fig.1-2 Switching Waveform

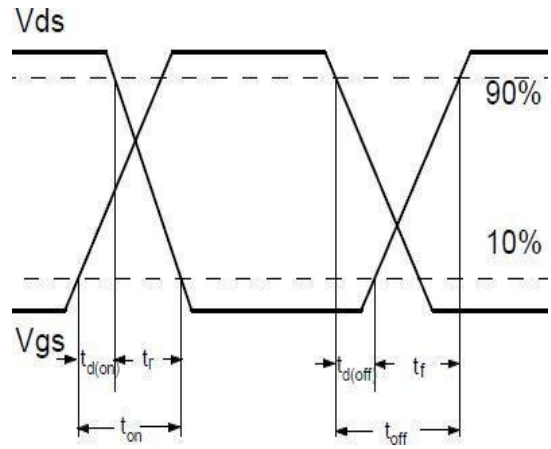


Fig.2-1 Gate charge test circuit

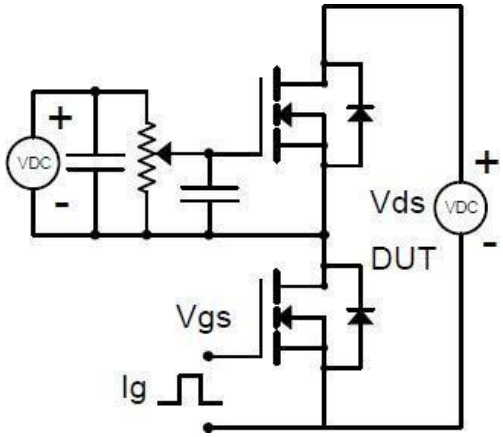


Fig.2-2 Gate charge waveform

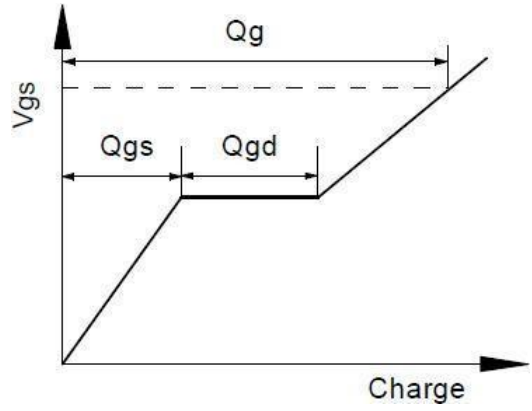


Fig.3-1 Avalanche test circuit

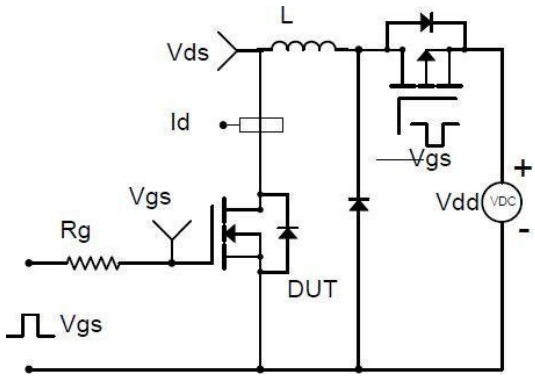
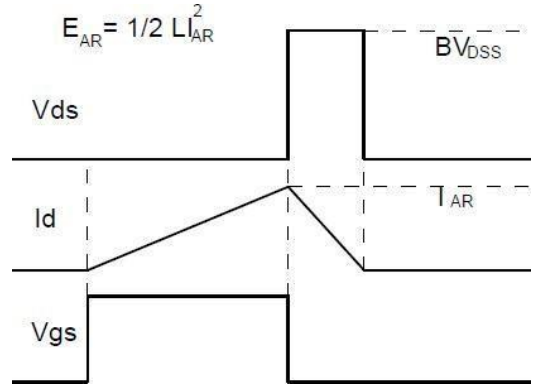
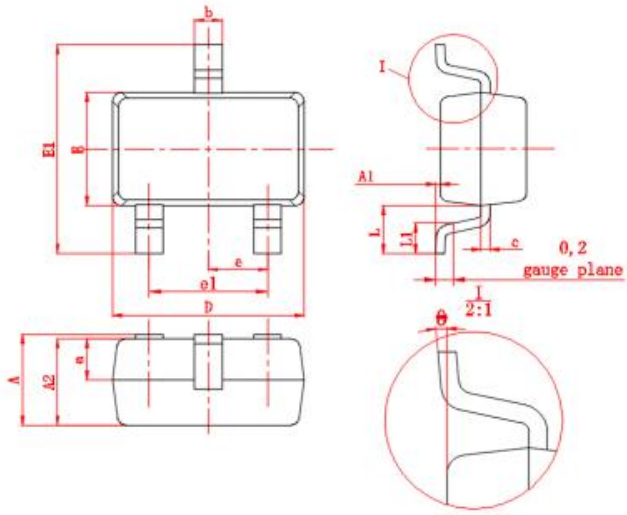


Fig.3-2 Avalanche waveform



Package Outline Dimensions (Units: mm) SOT-323



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)				