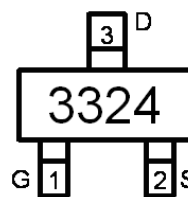


Main Product Characteristics:

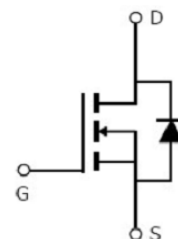
V_{DSS}	30V
$R_{DS(on)}$	26.5mohm(typ.)
I_D	5.8A ①



SOT23



Marking and pin
Assignment



Schematic diagram

Features and Benefits:

- Advanced trench MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature



Description:

It utilizes the latest trench processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications

Absolute max Rating:

Symbol	Parameter	Max.	Units
$I_D @ TC = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	5.8 ①	A
$I_D @ TC = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	4.2 ①	
I_{DM}	Pulsed Drain Current ②	23	
$P_D @ TC = 25^\circ C$	Power Dissipation	1.4	W
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 12	V
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150	$^\circ C$


Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ③	—	90	$^\circ C/W$

Electrical Characterizes @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

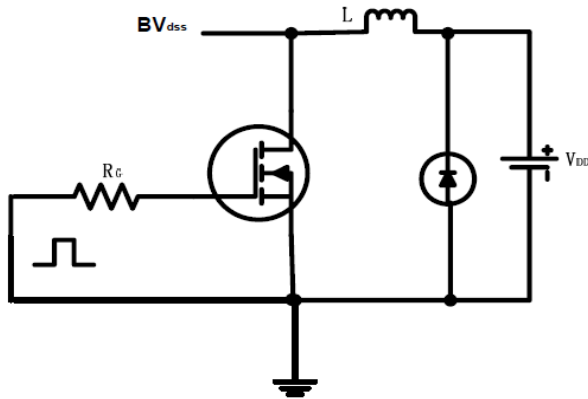
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	26.5	35	m Ω	$V_{GS}=4.5V, I_D = 2A$
		—	43.7	—		$T_J = 125^{\circ}\text{C}$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	31	52	m Ω	$V_{GS}=2.5V, I_D=1.5A$
		—	50.2	—		$T_J = 125^{\circ}\text{C}$
$V_{GS(th)}$	Gate threshold voltage	0.7	—	1.4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
		—	0.63	—		$T_J = 125^{\circ}\text{C}$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	50		$T_J = 125^{\circ}\text{C}$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 12V$
		—	—	-100		$V_{GS} = -12V$
Q_g	Total gate charge	—	10	—	nC	$I_D = 5.8A,$ $V_{DS}=15V,$ $V_{GS} = 4.5V$
Q_{gs}	Gate-to-Source charge	—	2	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	3	—		
$t_{d(on)}$	Turn-on delay time	—	3	—	ns	$V_{GS}=10V, V_{DS} = 15V,$ $R_{GEN}=3\Omega,$
t_r	Rise time	—	5	—		
$t_{d(off)}$	Turn-Off delay time	—	26	—		
t_f	Fall time	—	4	—		
C_{iss}	Input capacitance	—	1245	—	pF	$V_{GS} = 0V,$ $V_{DS} = 15V,$ $f = 1\text{MHz}$
C_{oss}	Output capacitance	—	85	—		
C_{rss}	Reverse transfer capacitance	—	70	—		

Source-Drain Ratings and Characteristics

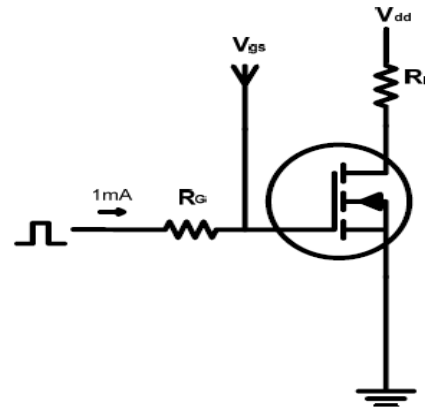
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	5.8 ①	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	23	A	
V_{SD}	Diode Forward Voltage	—	0.72	1.2	V	

Test circuits and Waveforms

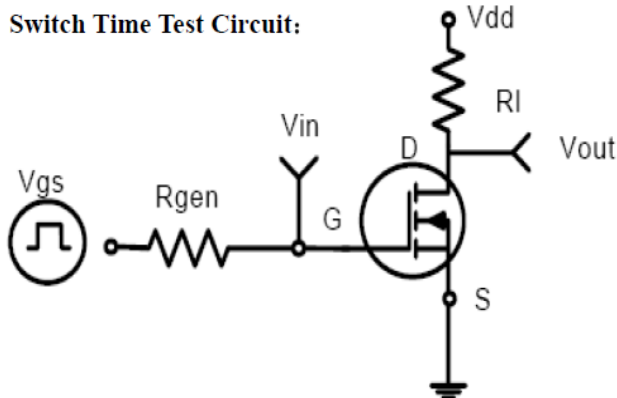
EAS test circuits:



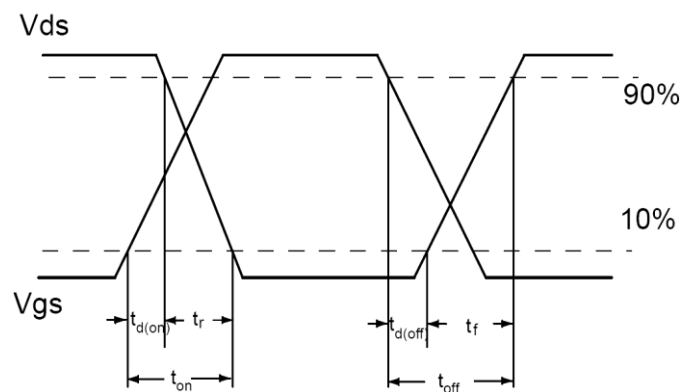
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max junction temperature.
- ③ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$
- ④ These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)} = 150^\circ\text{C}$.

Typical electrical and thermal characteristics

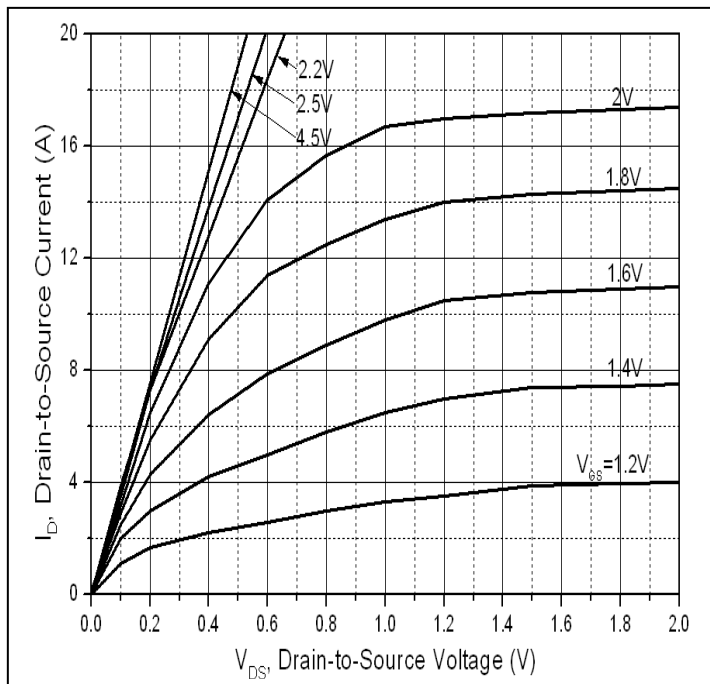


Figure 1: Typical Output Characteristics

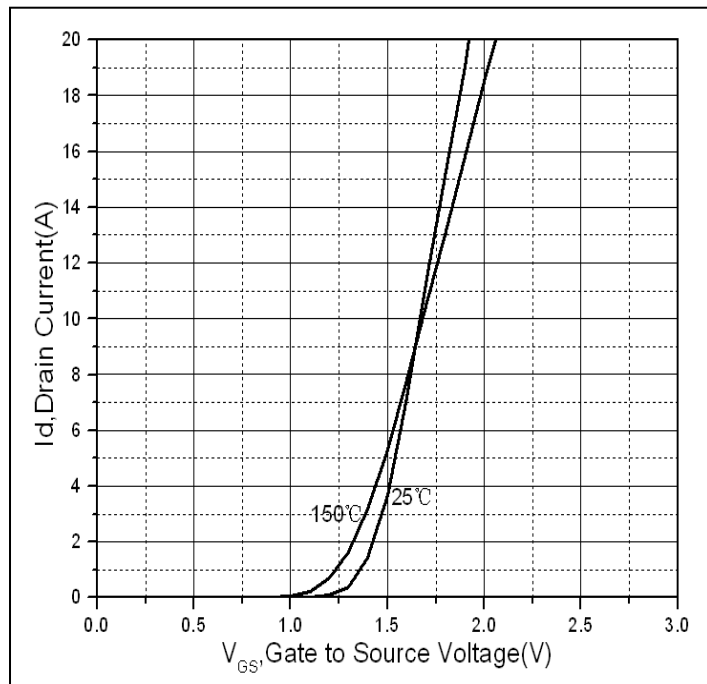


Figure 2: Typical Transfer Characteristics

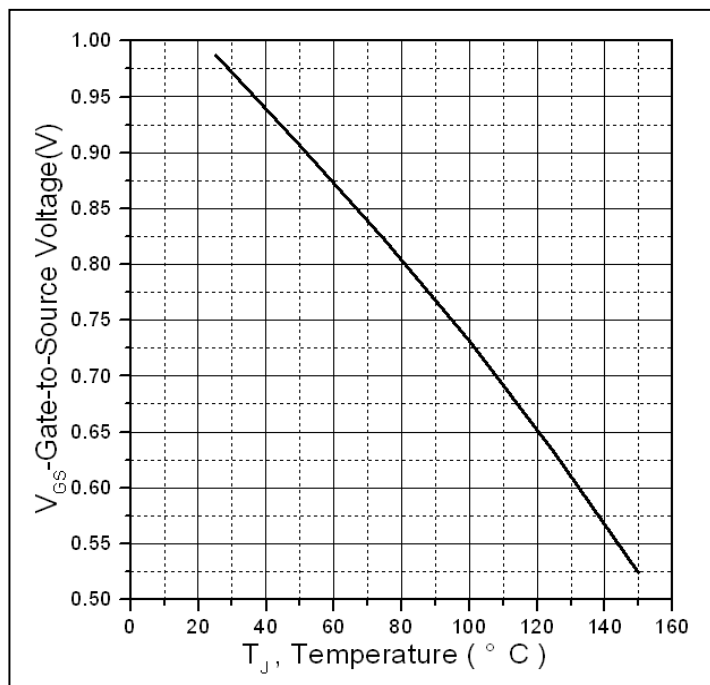


Figure 3. Gate to source cut-off voltage

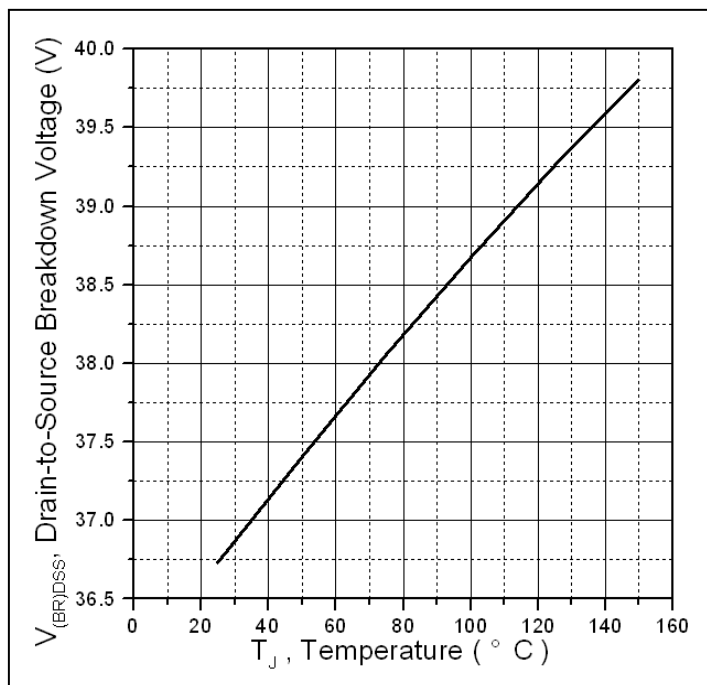


Figure 4: Drain-to-Source Breakdown Voltage vs. Temperature

Typical electrical and thermal characteristics

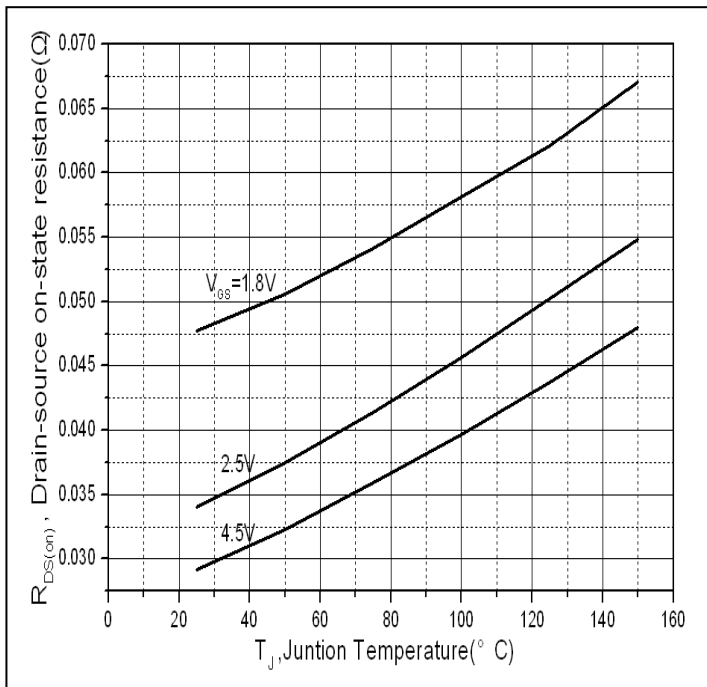


Figure 5. Normalized On-Resistance Vs. Case Temperature

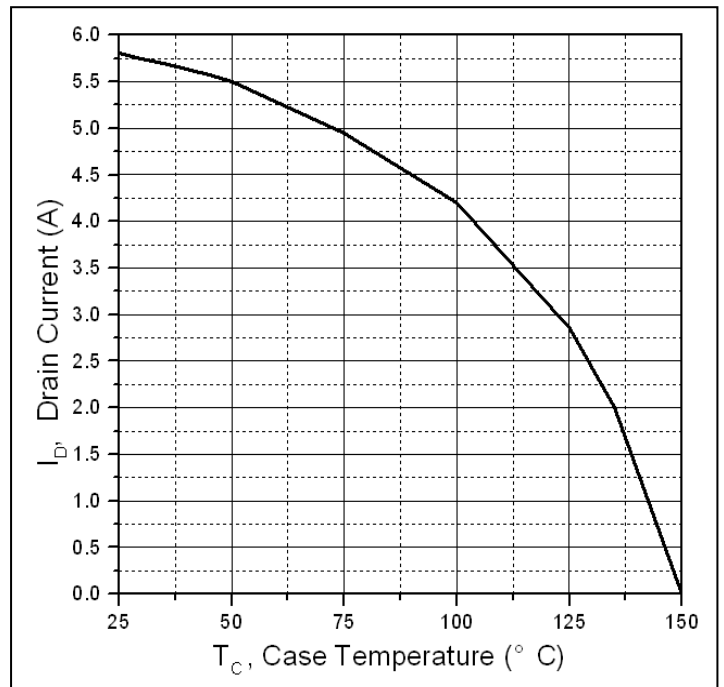


Figure 6. Maximum Drain Current Vs. Case Temperature

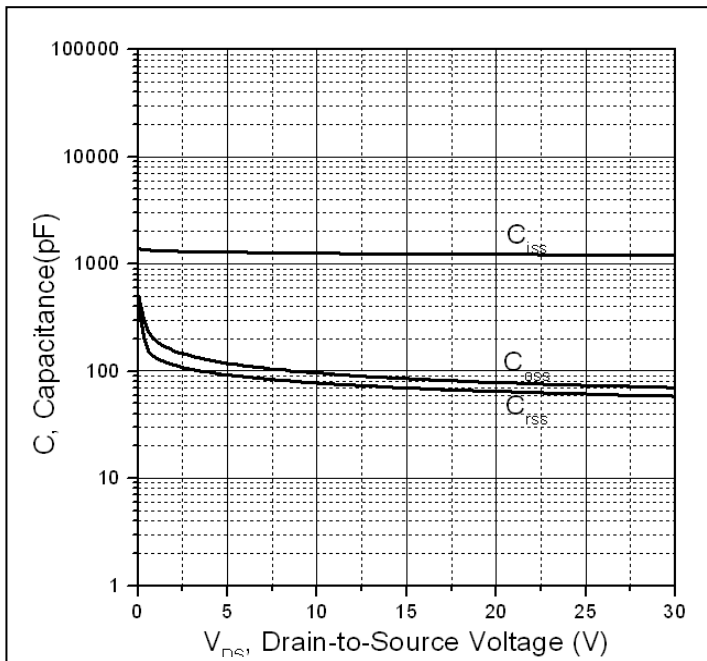


Figure 7. Typical Capacitance Vs. Drain-to-Source Voltage

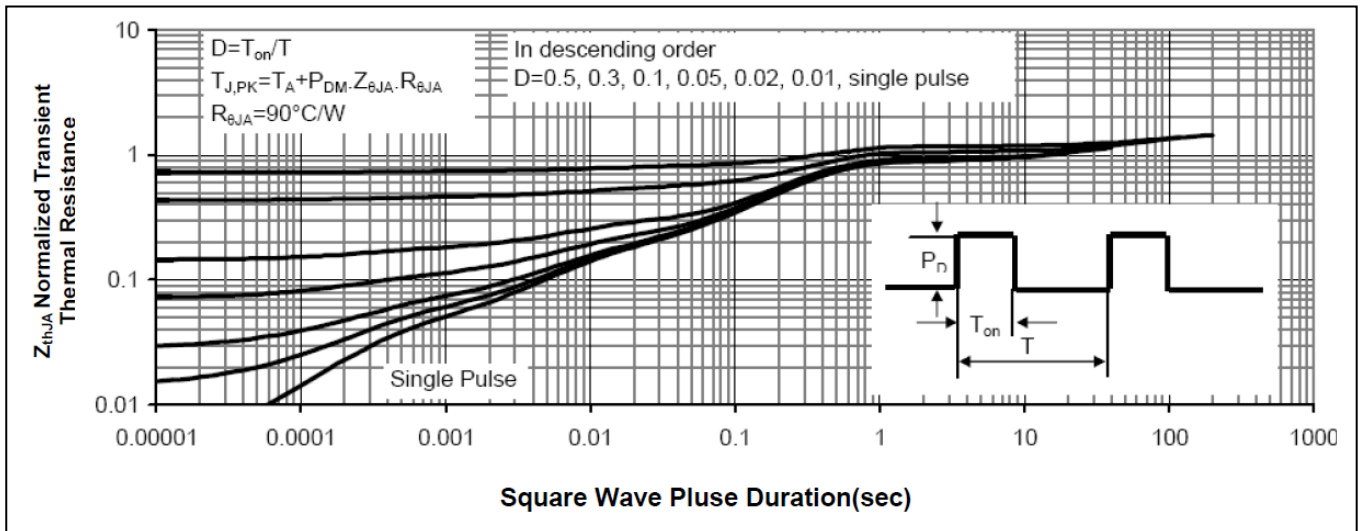
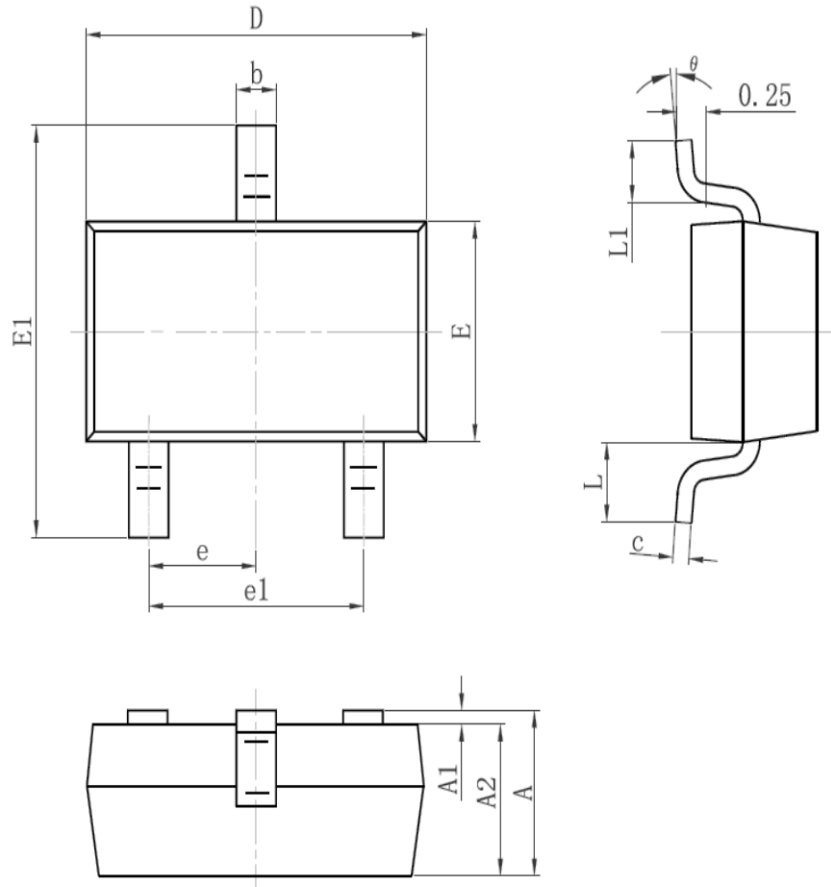


Figure8. Normalized Maximum Transient Thermal Impedance



Mechanical Data:

SOT-23 PACKAGE OUTLINE DIMENSION



Symbol	Dimension In Millimeters		Dimension In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.95TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.55REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°



Ordering and Marking Information

Device Marking: 3324

Package (Available)
SOT-23
Operating Temperature Range
C : -55 to 150 °C

Devices per Unit

Package Type	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT23	3000	10	30000	4	120000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T _j = 150°C @ 80% of Max V _{DSS} /V _{CES} /V _R	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T _j =150°C @ 100% of Max V _{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices

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