CMT3404R

30V N-Channel MOSFET

Description

Features

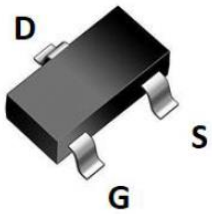
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

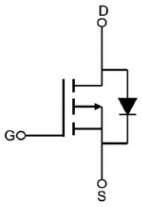
- Load Switch
- PWM Application
- Power management

V_{DS}	30	V
$R_{ds(on),typ}$@V_{gs}=10V	18	mΩ
$R_{ds(on),typ}$@V_{gs}=4.5V	28	mΩ
I_D	5.8	A

Top View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMT3404R	3404	SOT-23	Reel	NA	NA	5000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
ID@Tc=25℃	Continuous Drain Current, V_{GS}=10V	5.8	A
ID@Tc=100℃	Continuous Drain Current, V_{GS}=10V	4.3	A
IDM	Pulsed Drain Current[1]	23.2	A
PD@Tc=25℃	Total Power Dissipation	1.47	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_j	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance Junction-Case	69	85	℃/W

Electrical Characteristics (T_J=25 ℃, Unless otherwise noted)

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	30	--	--	V	V_{GS}=0V, I_D=250uA
$R_{DS(ON)}$	Static Drain-Source On-Resistance	--	18	25	mΩ	V_{GS}=10V, I_D=5.5A
		--	28	40		V_{GS}=4.5V, I_D=4.5A
$V_{GS(th)}$	Gate Threshold Voltage	1.0	1.5	2.5	V	V_{GS}=V_{DS}, I_D=250uA
IDSS	Drain-Source Leakage Current	--	--	1	uA	V_{DS}=30V, V_{GS}=0V, T_J=25℃
		--	--	10	uA	V_{DS}=24V, V_{GS}=0V, T_J=125℃
IGSS	Gate-Source Leakage Current	--	--	±100	nA	V_{GS}=±20V, V_{DS}=0V
gfs	Forward Transconductance	--	21	--	S	V_{DS}=5V, I_D=5.5A
Rg	Gate Resistance	--	2.1	--	Ω	V_{DS}=0V, V_{GS}=0V, f=1MHz
Qg	Total Gate Charge	--	5.3	--	nC	V_{DS}=15V, V_{GS}=10V, I_D=5.8A
Qgs	Gate-Source Charge	--	1	--		
Qgd	Gate-Drain Charge	--	1.4	--		
$Td_{(on)}$	Turn-On Delay Time	--	4.6	--	ns	V_{DD}=15V, V_{GS}=10V, R_G=3Ω I_D=3A
T_r	Rise Time	--	2.5	--		
$Td_{(off)}$	Turn-Off Delay Time	--	14.6	--		
T_f	Fall Time	--	3.6	--		
Ciss	Input CapacitanceS	--	494	--	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
Coss	Output Capacitance	--	118	--		
Crss	Reverse Transfer Capacitance	--	69	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Is	Continuous Source Current	VG=VD=0V, Force Current	--	--	5.8	A
Ism	Pulsed Source Current		--	--	23.2	A
V_{SD}	Diode Forward Voltage	VGS=0V, I_S=2A, TJ=25℃	--	--	1.2	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≦ 300us, duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

Fig1 Output Characteristics

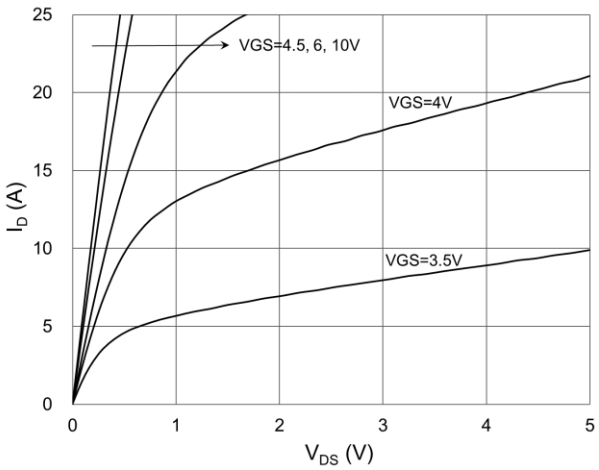


Fig2 Normalized R_{DSON} vs. T_J

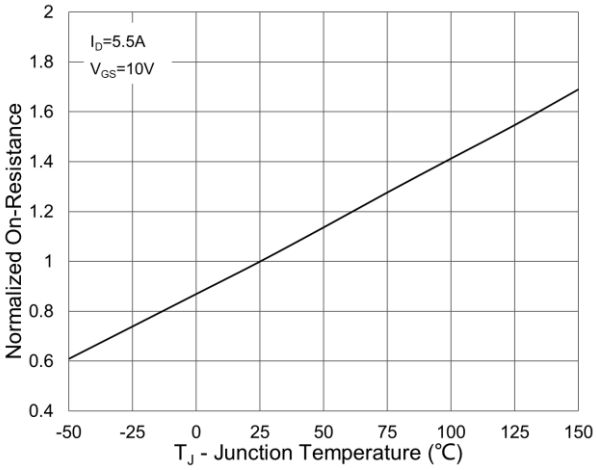


Fig3 Gate Charge Waveform

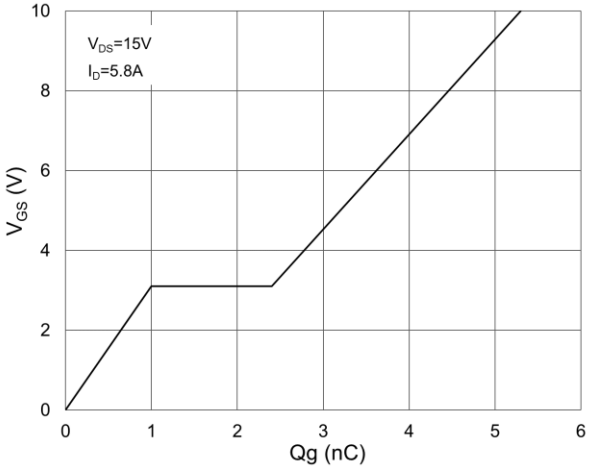


Fig4 Transfer Characteristics

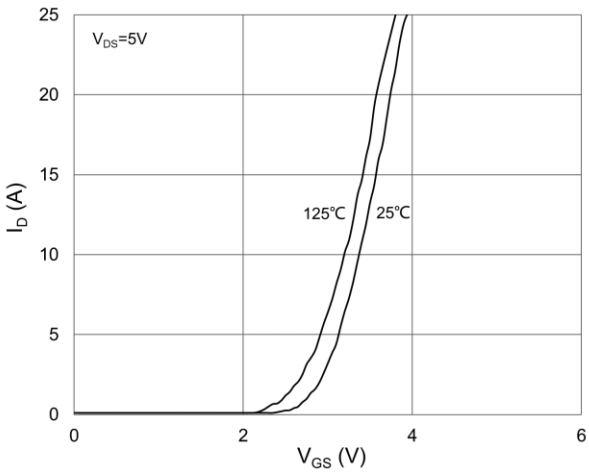


Fig5 Rds(on) vs. Drain Current and Gate Voltage

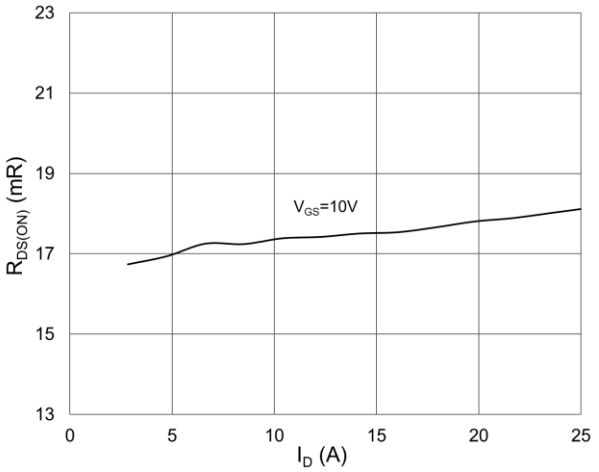


Fig6 Rds(on) vs. Gate Voltage

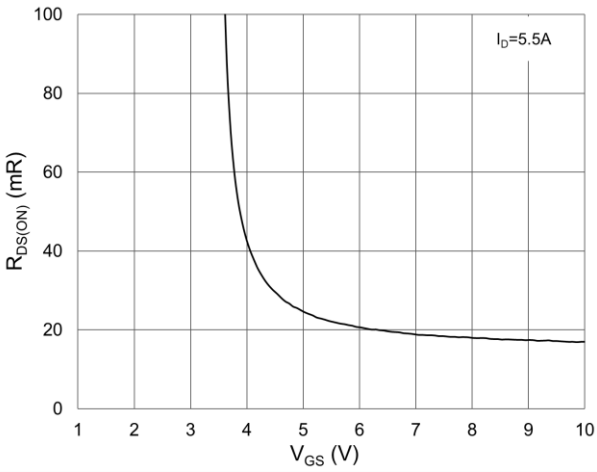


Fig7 Capacitance Characteristics

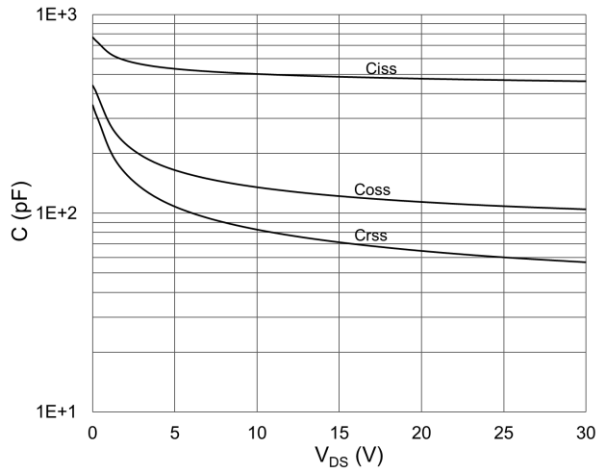


Fig8 Drain Current Derating

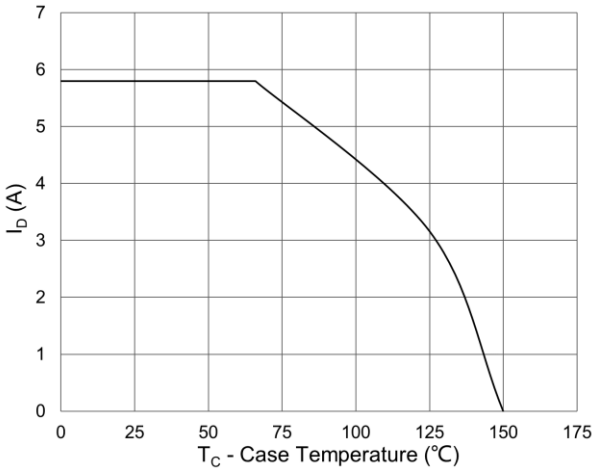


Fig9 Power Dissipation

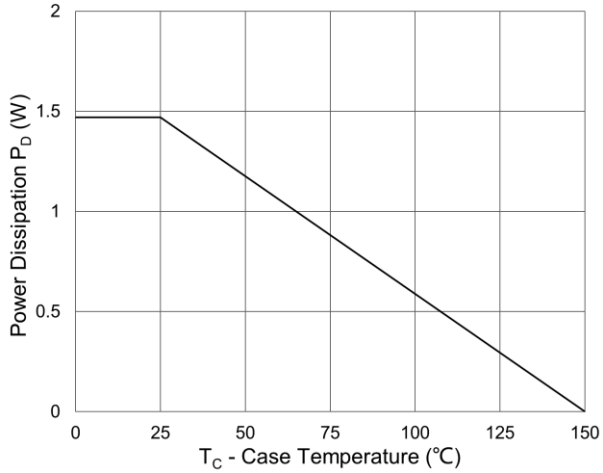


Fig10 Source-Drain Diode Forward Characteristics

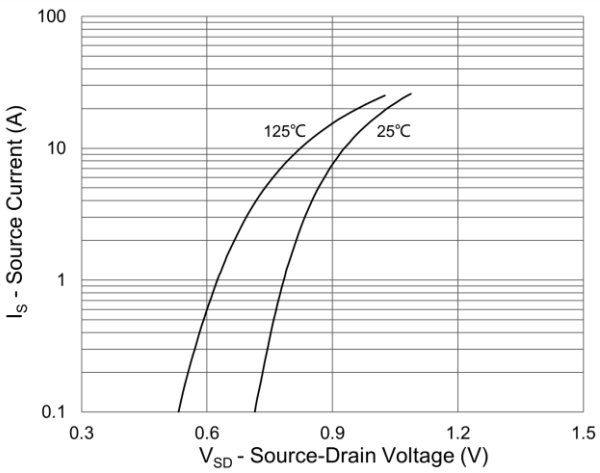


Fig11 Normalized Threshold Voltage vs. T_J

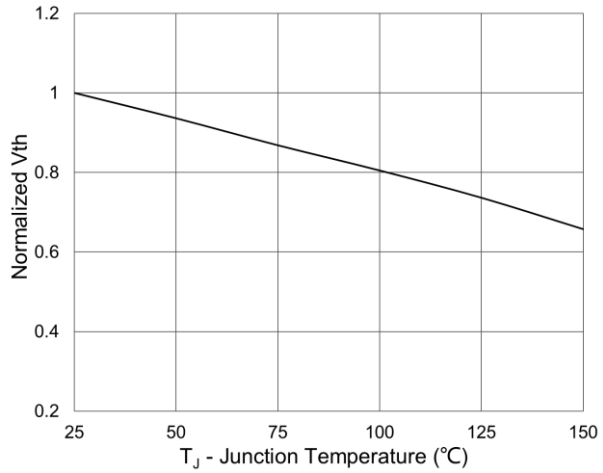


Fig12 Normalized Breakdown Voltage vs. T_J

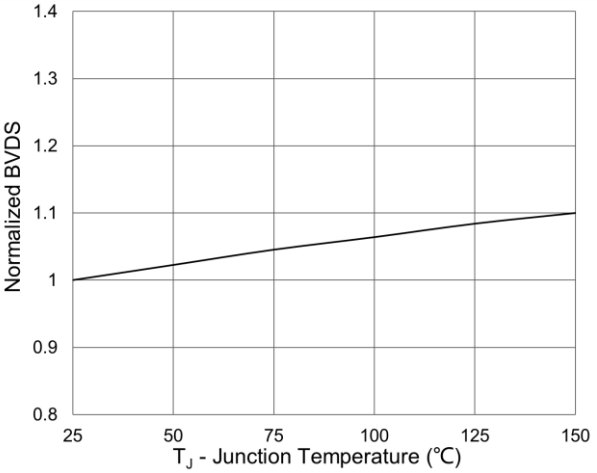


Fig13 Maximum Safe Operation Area

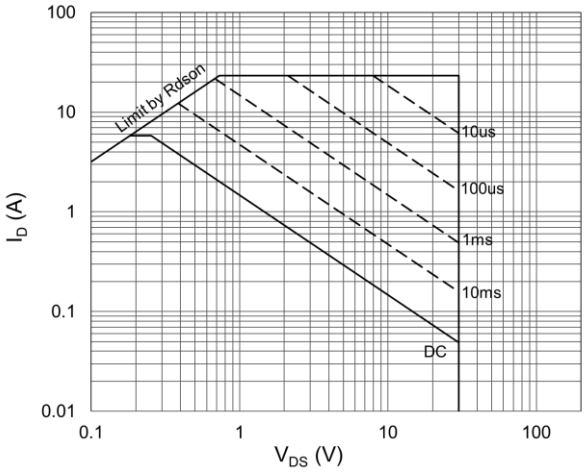
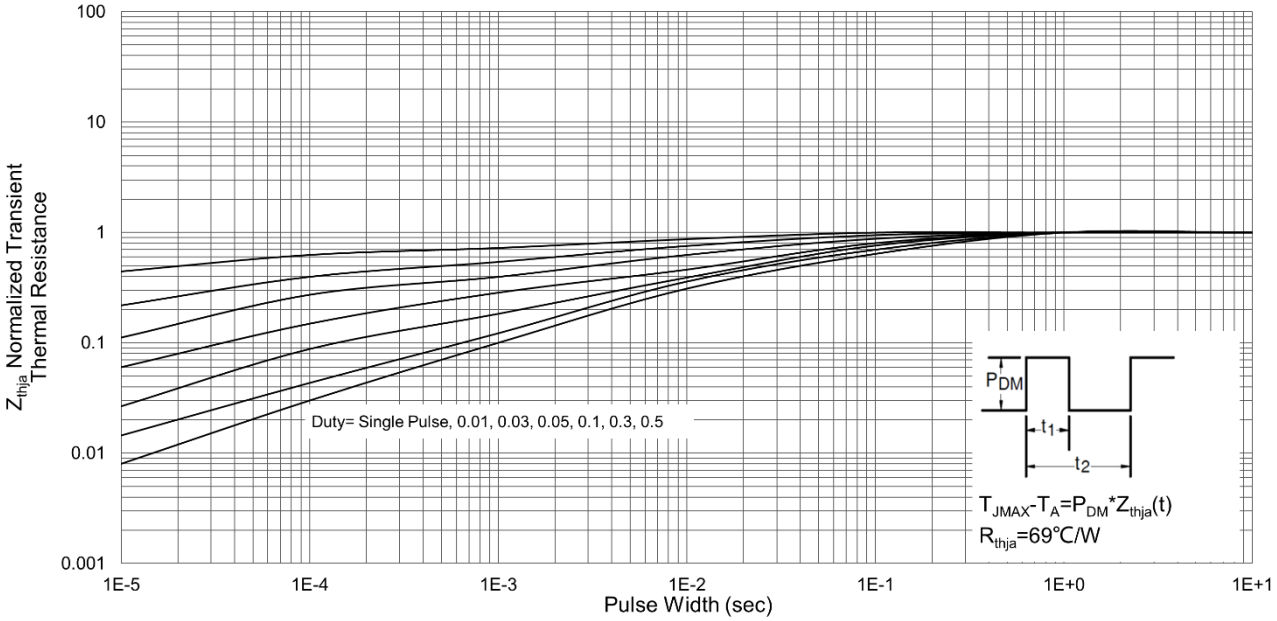
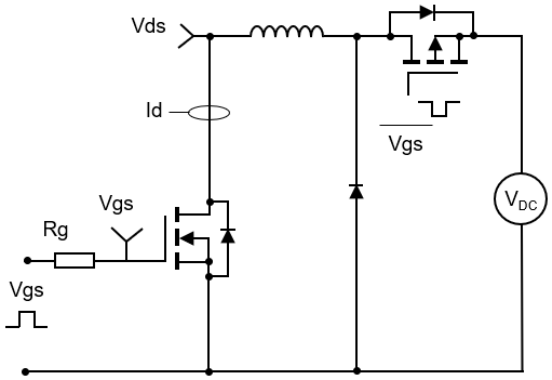


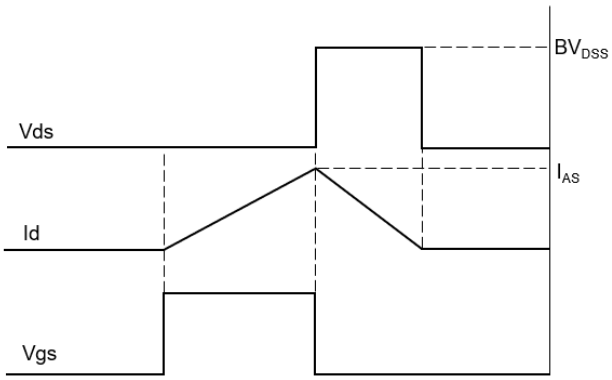
Fig14 Normalized Transient Impedance



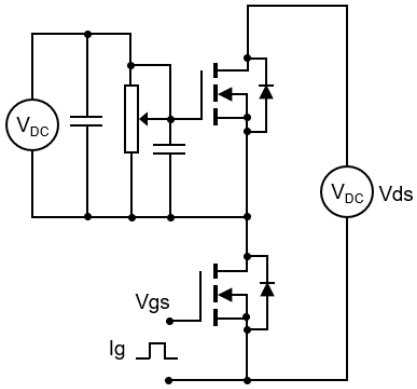
Test Circuit & Waveform

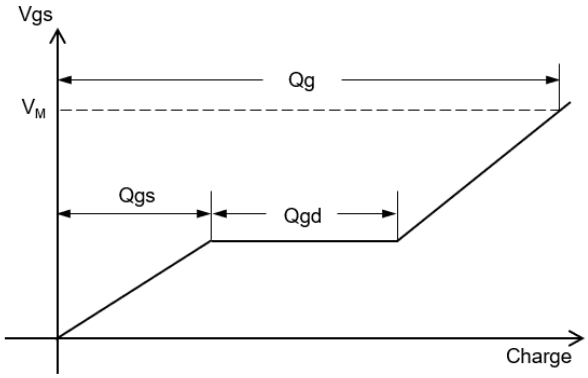
1. Unclamped Inductive Switching Test Circuit & Waveform



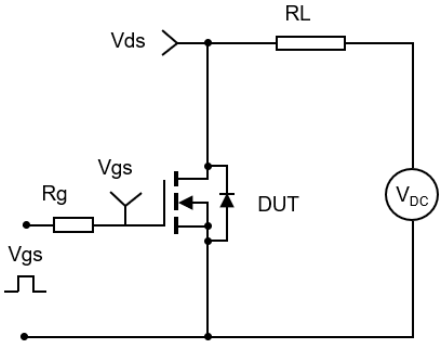


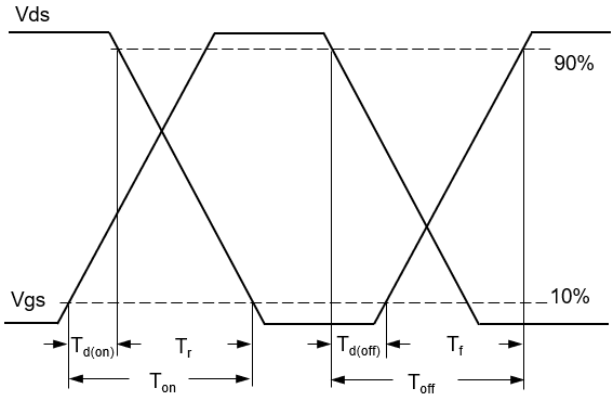
2. Gate Charge Test Circuit & Waveform



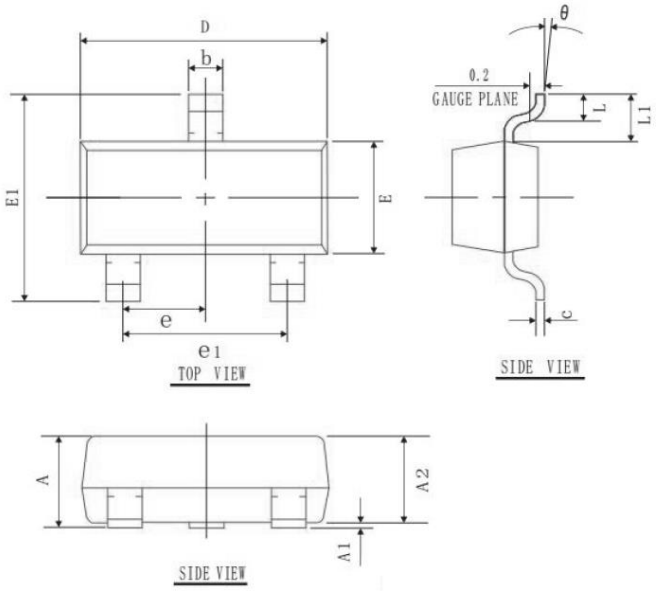


3. Resistive Switching Test Circuit & Waveform





SOT-23 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		