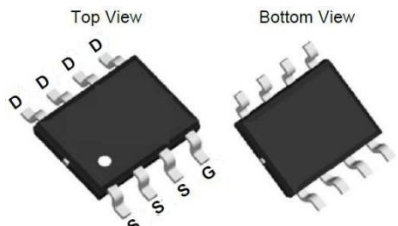
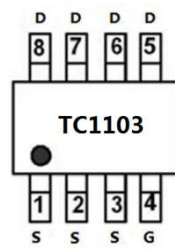
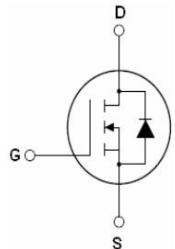




TC1103 (文件编号: S&CIC1826) N-channel Enhancement Mode Power MOSFET

Description

<p>Features</p> <ul style="list-style-type: none"> ● 30V, 12A $R_{DS(ON)} < 12m\Omega @ V_{GS} = 10V$ $R_{DS(ON)} < 18m\Omega @ V_{GS} = 4.5V$ ● Advanced Trench Technology ● Provide Excellent $R_{DS(ON)}$ and Low Gate Charge ● Lead free product is acquired 	<p>Application</p> <ul style="list-style-type: none"> ● Load Switch ● PWM Application ● Power management <p style="text-align: center; margin-top: 20px;">100% UIS TESTED! 100% ΔV_{ds} TESTED!</p>
<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>Top View Bottom View</p> <p>SOP-8(Dual)</p> </div> <div style="text-align: center;">  <p>TC1103</p> <p>Marking and pin Assignment</p> </div> <div style="text-align: center;">  <p>Schematic Diagram</p> </div> </div>	

Package Marking and Ordering Information

Device Marking	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
TC1103	TAPING	SOP-8	13cm*12mm	4000	48000

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

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	12
		$T_A = 100^\circ C$	8
I_{DM}	Pulsed Drain Current ^{note1}	48	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	16	mJ
P_D	Power Dissipation	$T_A = 25^\circ C$	3
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	46	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$



Electrical Characteristics (T_J=25 °C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance <small>note3</small>	V _{GS} =10V, I _D =13A	-	8.5	12	mΩ
		V _{GS} =4.5V, I _D =10A	-	13	18	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	900	-	pF
C _{oss}	Output Capacitance		-	140	-	pF
C _{rss}	Reverse Transfer Capacitance		-	120	-	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =10A, V _{GS} =10V	-	19	-	nC
Q _{gs}	Gate-Source Charge		-	6.3	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	4.5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V, I _D =6A, R _{GEN} =3Ω, V _{GS} =10V	-	6	-	ns
t _r	Turn-on Rise Time		-	5	-	ns
t _{d(off)}	Turn-off Delay Time		-	25	-	ns
t _f	Turn-off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	12	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	48	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =12A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =10A, dI/dt=100A/μs	-	7	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	6.3	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25 °C, V_{GS}=10V, R_G=25Ω, L=0.5mH, I_{AS}=8A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



Typical Performance Characteristics

Figure 1: Output Characteristics

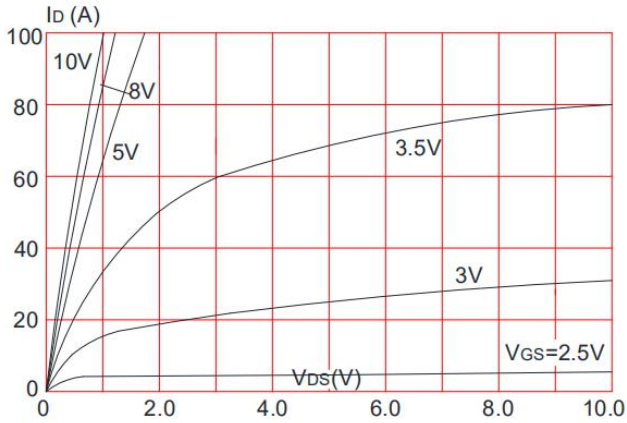


Figure 2: Typical Transfer Characteristics

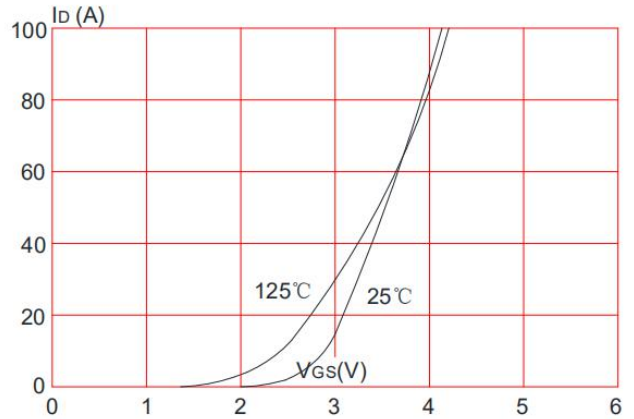


Figure 3: On-resistance vs. Drain Current

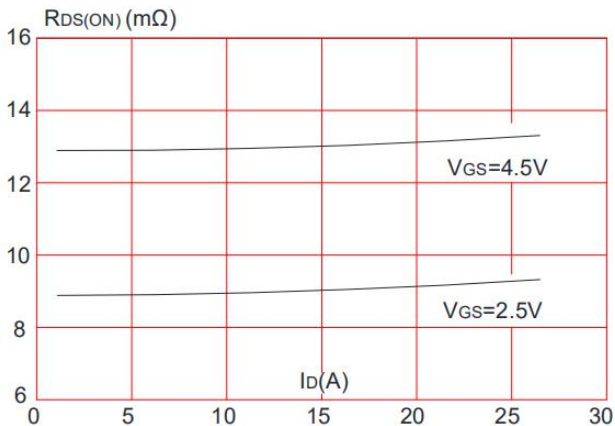


Figure 4: Body Diode Characteristics

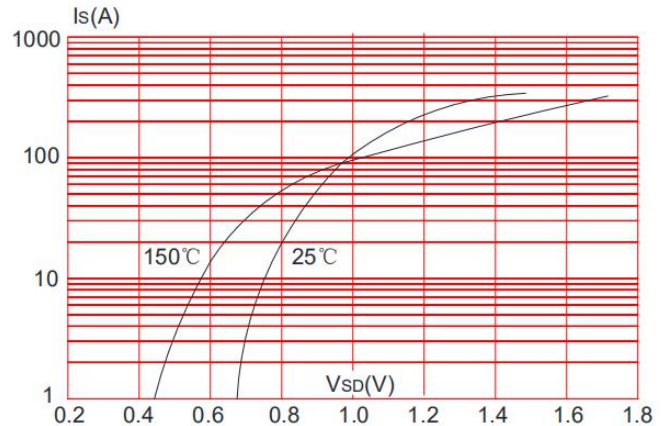


Figure 5: Gate Charge Characteristics

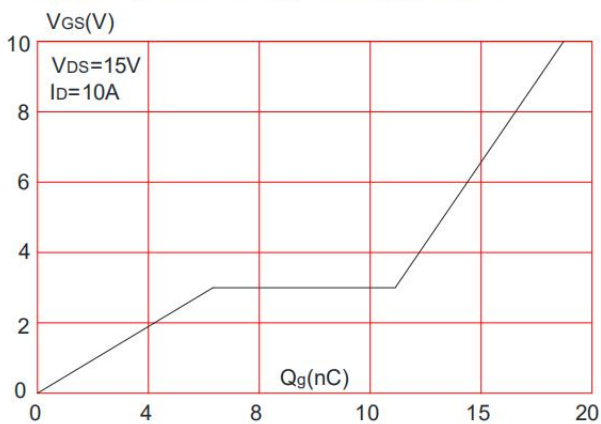


Figure 6: Capacitance Characteristics

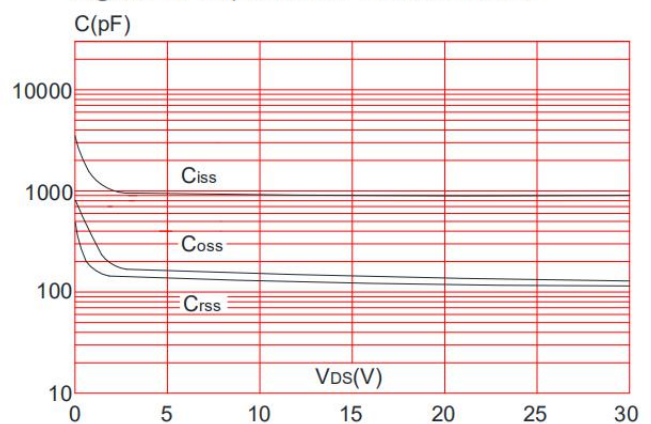




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

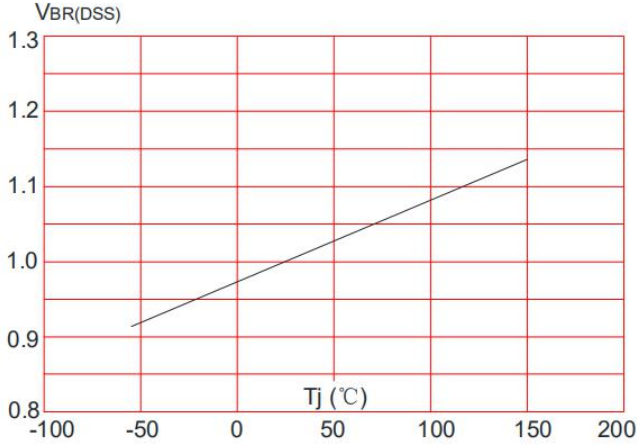


Figure 8: Normalized on Resistance vs. Junction Temperature

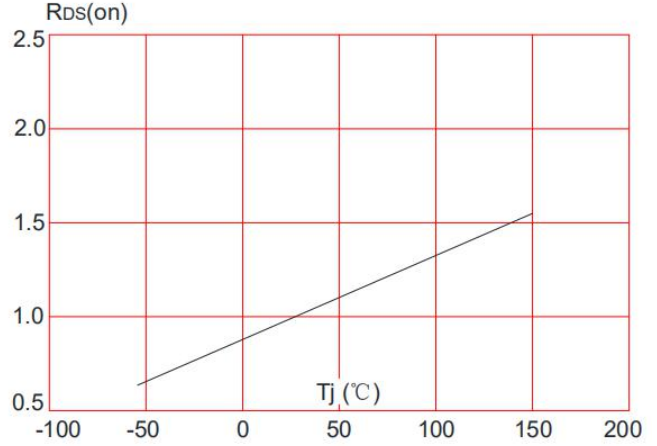


Figure 9: Maximum Safe Operating Area

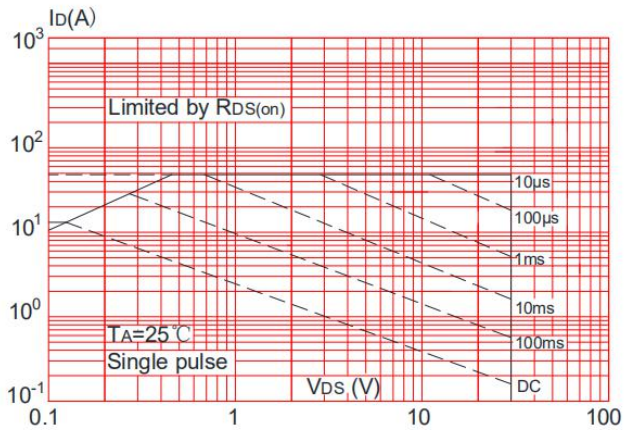


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

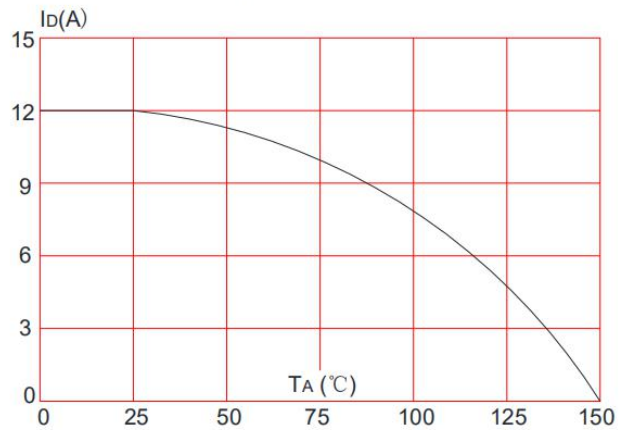
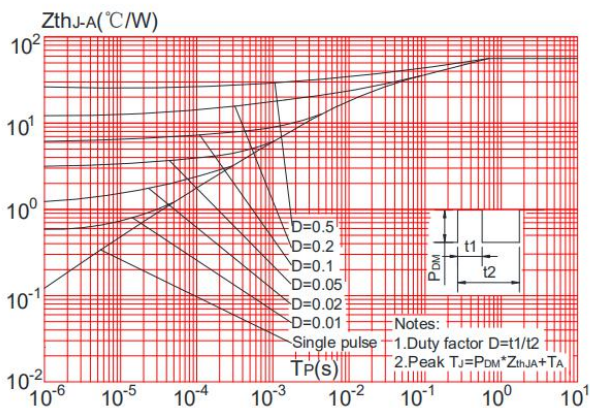


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Test Circuit

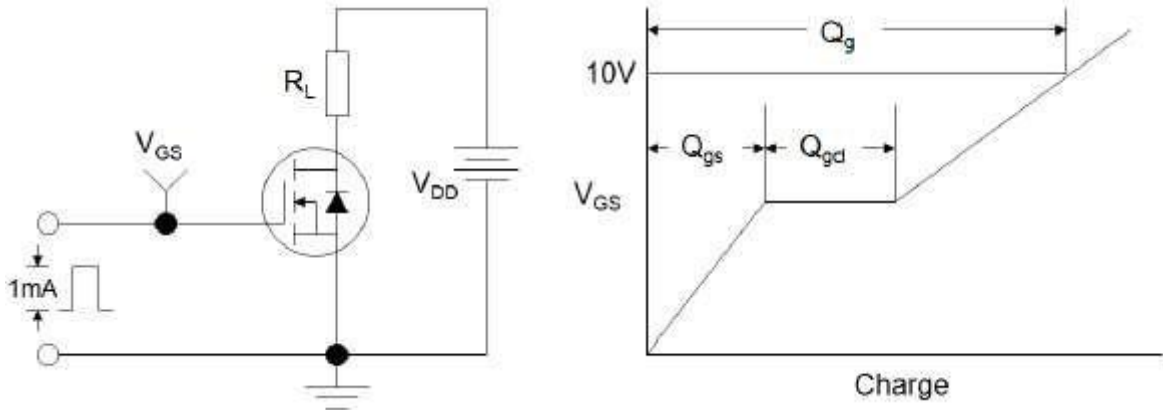


Figure 1: Gate Charge Test Circuit & Waveform

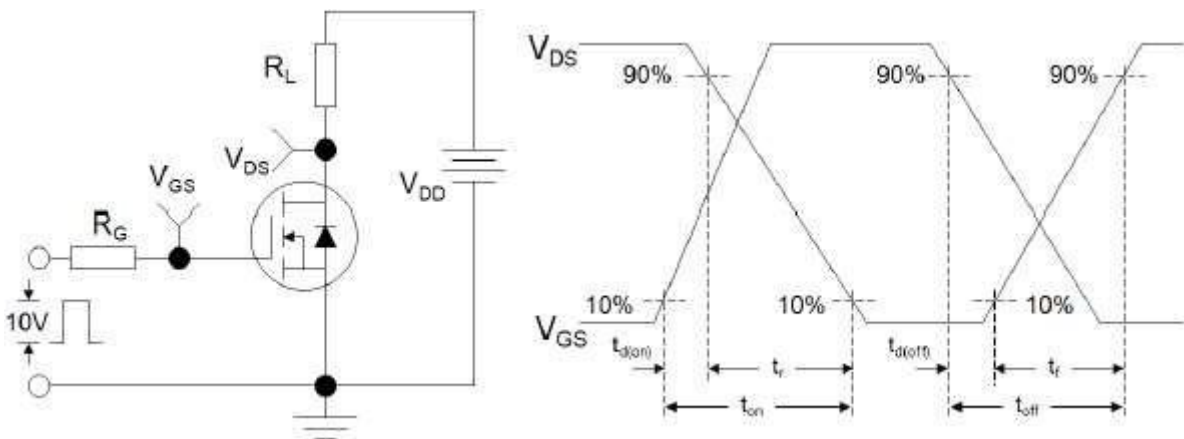


Figure 2: Resistive Switching Test Circuit & Waveforms

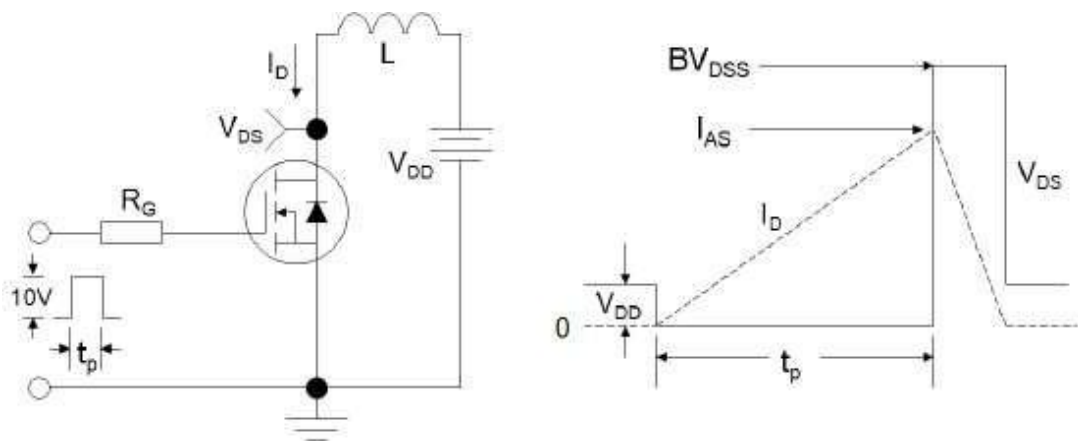
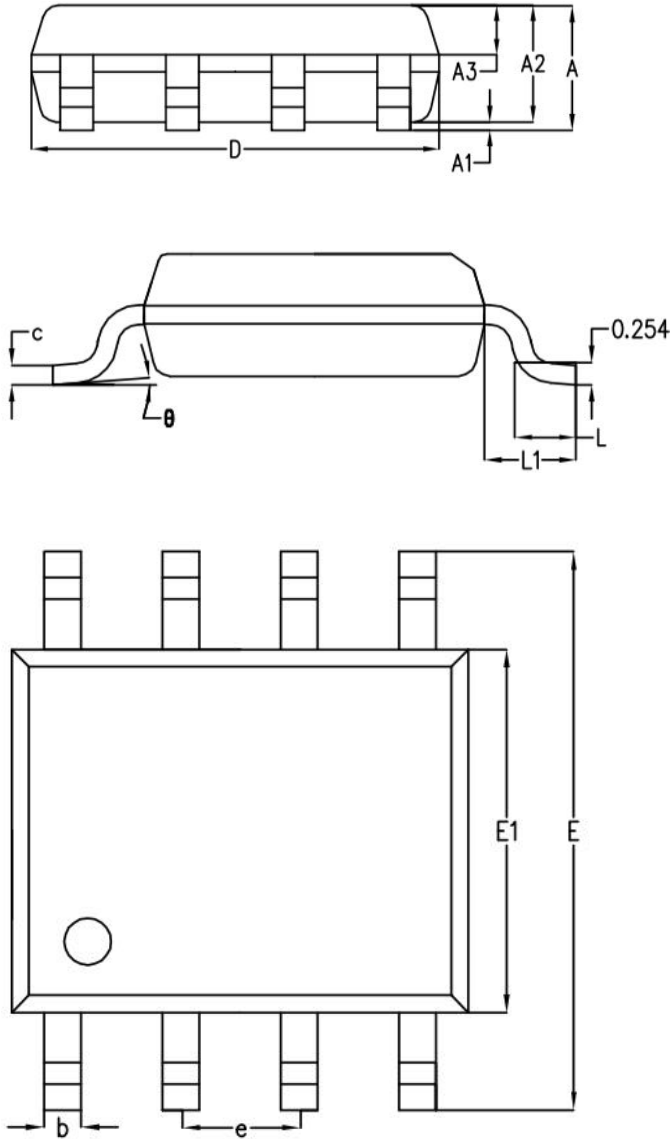


Figure 3: Unclamped Inductive Switching Test Circuit & Waveforms



Package Mechanical Data- SOP-8



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	-	1.50	1.55
A1	-	0.10	0.15
A2	1.35	1.40	1.45
A3	0.55	0.60	0.65
b	0.35	0.40	0.45
c	0.17	0.22	0.25
D	4.85	4.90	4.95
E	5.90	6.00	6.10
E1	3.80	3.90	4.00
e	1.27BSC		
L	0.60	0.65	0.70
L1	1.05BSC		
θ	0°	4°	6°