



### CSTS260N10G N-Ch 100V Fast Switching MOSFETs

#### CSTS260N10G Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

#### CSTS260N10G Product Summary

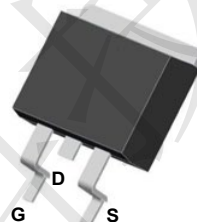


BVDSS	RDSON	ID
100V	2.4 mΩ	260A

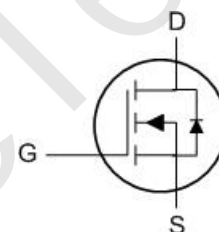
#### CSTS260N10G Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

#### CSTS260N10G TO-263 Pin Configuration



TO-263



#### CSTS260N10G Absolute Maximum Ratings (TA = 25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	260
		$T_C=100^\circ\text{C}$	163
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	1028	A
Single Pulse Avalanche Energy <sup>2</sup>	<b>EAS</b>	583	mJ
Total Power Dissipation	$P_D$	379	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C

#### CSTS260N10G Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient <sup>3</sup>	$R_{\theta JA}$	59	°C/W



### CSTS260N10G N-Ch 100V Fast Switching MOSFETs

#### CSTS260N10G Electrical Characteristics (T<sub>J</sub> = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
<b>Static Characteristics</b>							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100	-	-	V	
Gate-body Leakage current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	T <sub>J</sub> = 25°C	-	-	1	μA
			T <sub>J</sub> = 100°C	-	-	100	
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2	3	4	V	
Drain-Source on-Resistance <sup>4</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	-	2.4	2.8	mΩ	
Forward Transconductance <sup>4</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 20A	-	76	-	S	
<b>Dynamic Characteristics<sup>5</sup></b>							
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz	-	9030	-	pF	
Output Capacitance	C <sub>oss</sub>		-	1505	-		
Reverse Transfer Capacitance	C <sub>rss</sub>		-	40	-		
Gate Resistance	R <sub>g</sub>	f = 1MHz	-	2.3	-	Ω	
<b>Switching Characteristics<sup>5</sup></b>							
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, I <sub>D</sub> = 20A	-	150	-	nC	
Gate-Source Charge	Q <sub>gs</sub>		-	32.5	-		
Gate-Drain Charge	Q <sub>gd</sub>		-	49	-		
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 50V, R <sub>G</sub> = 3Ω, I <sub>D</sub> = 20A	-	27	-	ns	
Rise Time	t <sub>r</sub>		-	78.5	-		
Turn-off Delay Time	t <sub>d(off)</sub>		-	110	-		
Fall Time	t <sub>f</sub>		-	86	-		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20A, di/dt = 100A/μs	-	88	-	ns	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	220	-	nC	
<b>Drain-Source Body Diode Characteristics</b>							
Diode Forward Voltage <sup>4</sup>	V <sub>SD</sub>	I <sub>D</sub> = 20A, V <sub>GS</sub> = 0V	-	-	1.2	V	
Continuous Source Current	I <sub>S</sub>	T <sub>C</sub> = 25°C	-	-	260	A	

#### Notes:

1. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub> = 150°C.
2. The EAS data shows Max. rating. The test condition is V<sub>DD</sub> = 50V, V<sub>GS</sub> = 10V, L = 0.4mH, I<sub>AS</sub> = 54A.
3. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.



#### CSTS260N10G Typical Characteristics

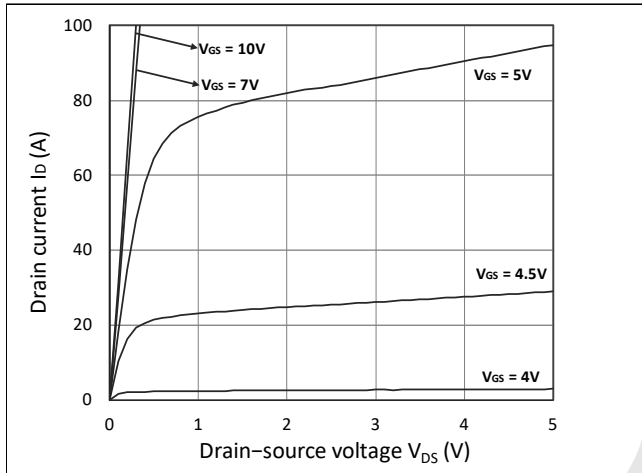


Figure 1. Output Characteristics

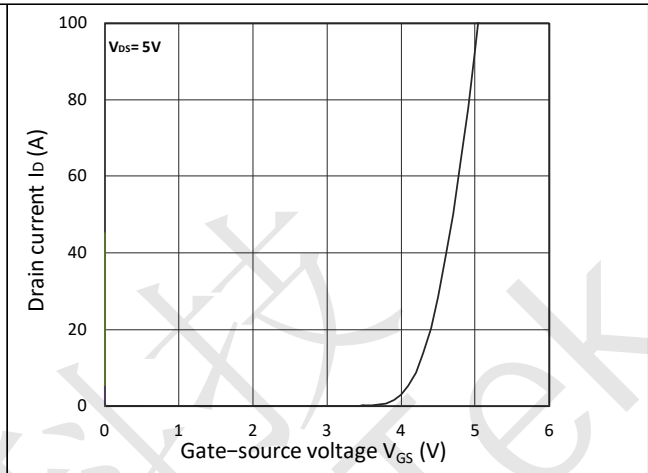


Figure 2. Transfer Characteristics

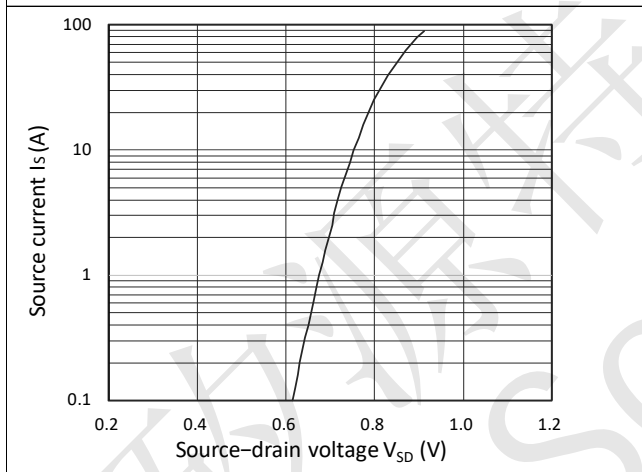


Figure 3. Forward Characteristics of Reverse

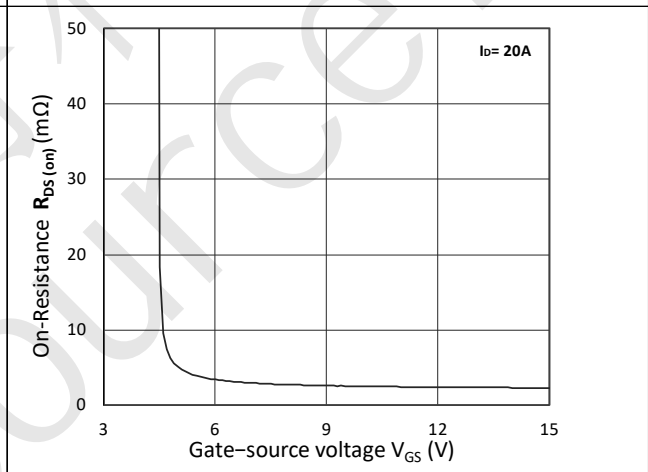


Figure 4.  $R_{DS(on)}$  vs.  $V_{GS}$

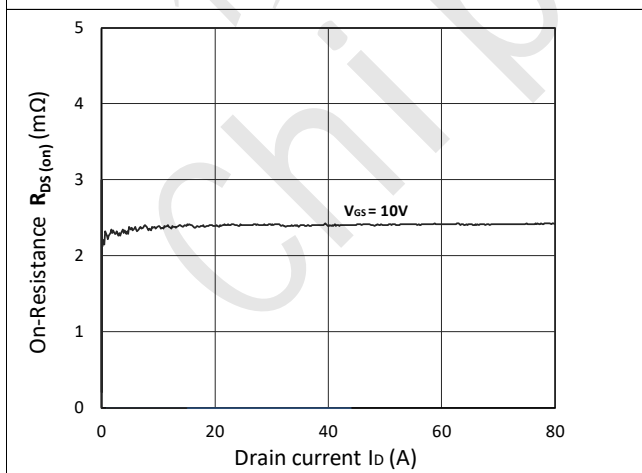


Figure 5.  $R_{DS(on)}$  vs.  $I_D$

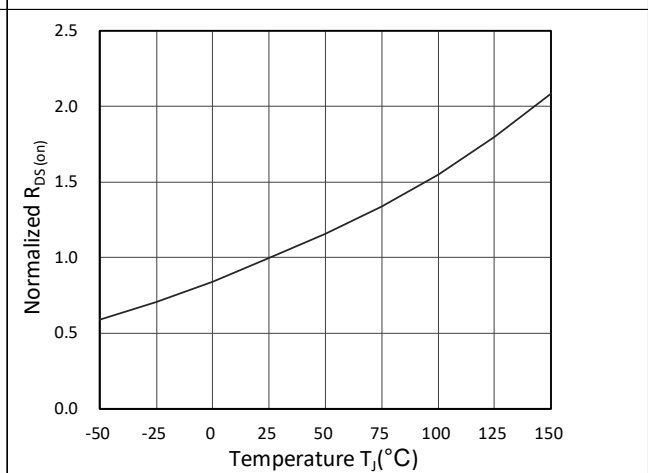


Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature



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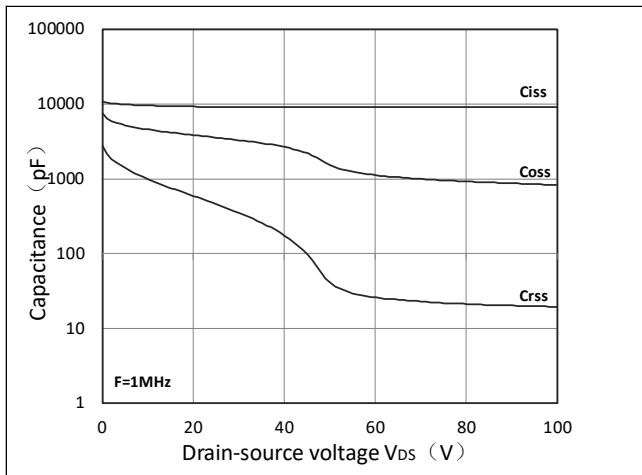


Figure 7. Capacitance Characteristics

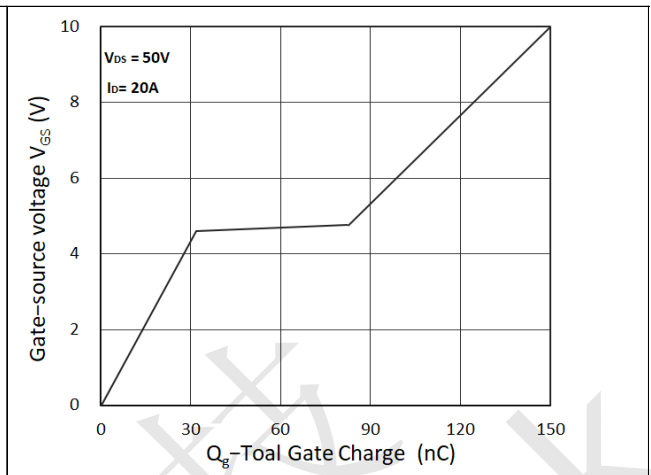


Figure 8. Gate Charge Characteristics

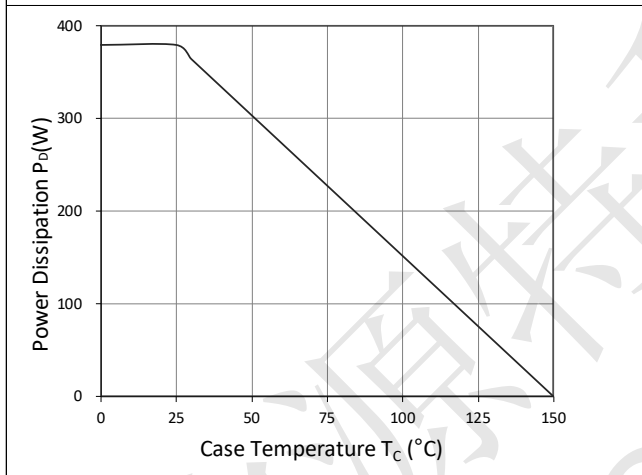


Figure 9. Power Dissipation

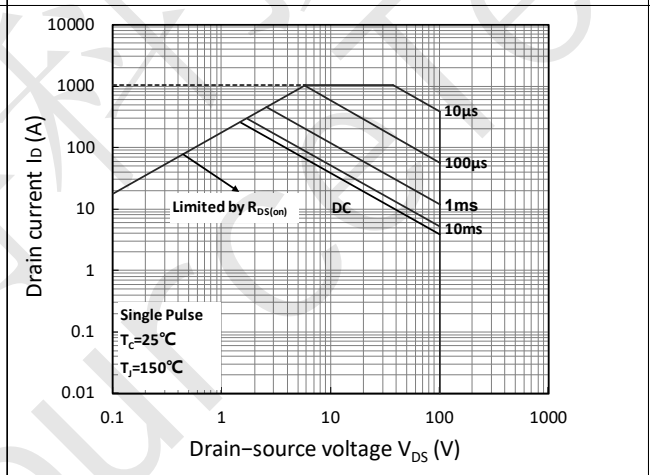


Figure 10. Safe Operating Area

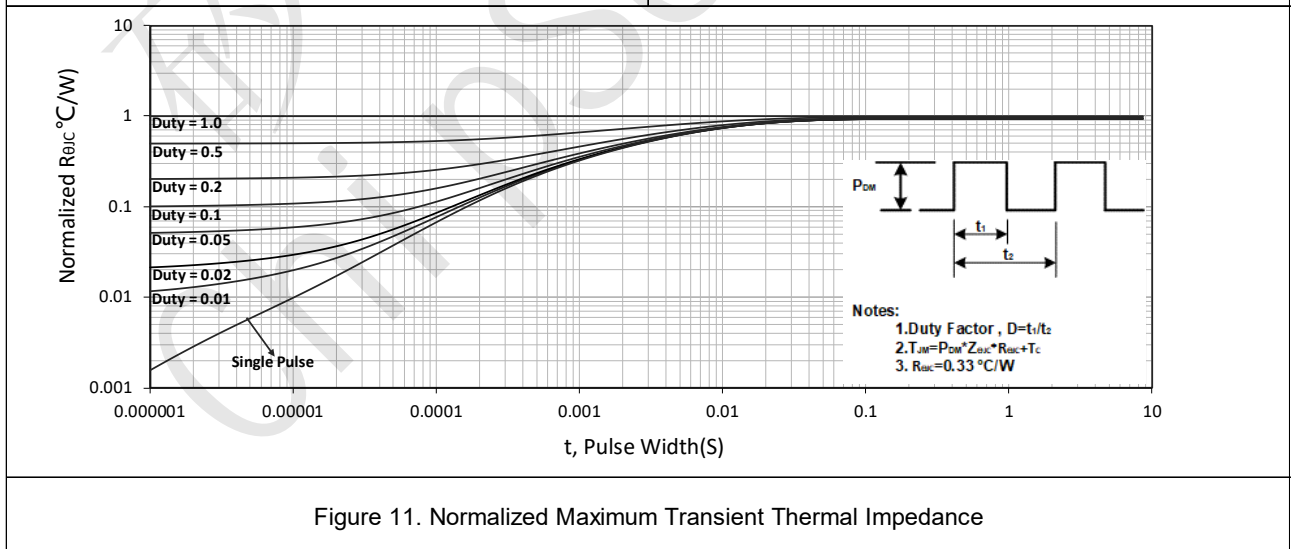


Figure 11. Normalized Maximum Transient Thermal Impedance



### CSTS260N10G Test Circuit

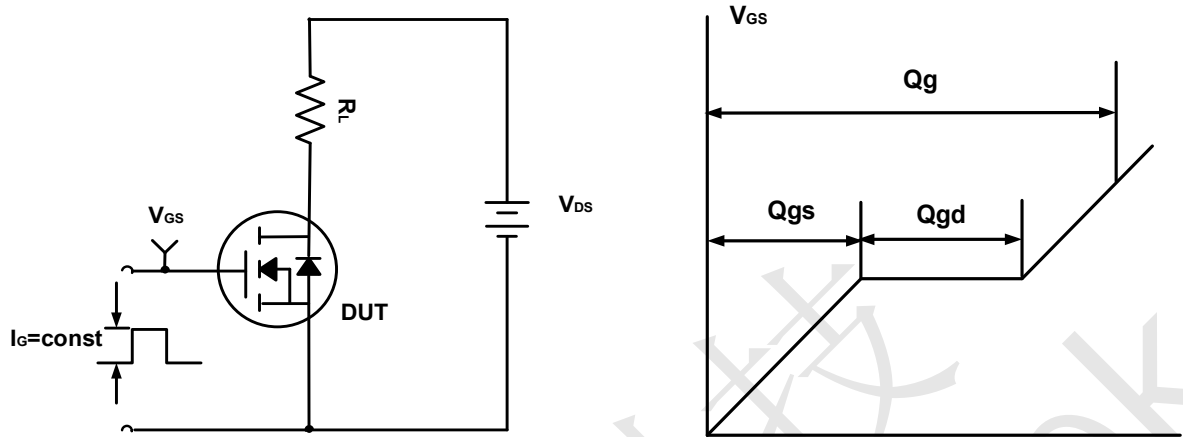


Figure A. Gate Charge Test Circuit & Waveforms

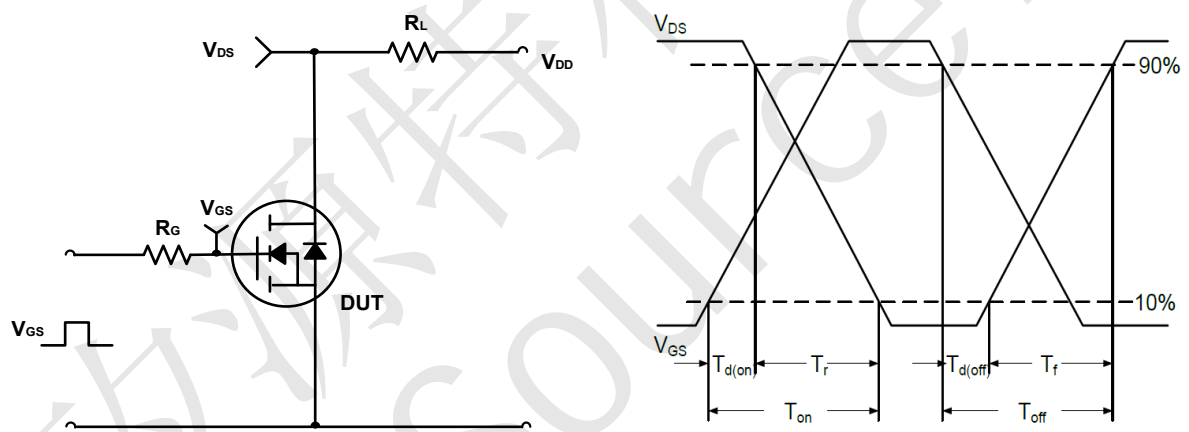
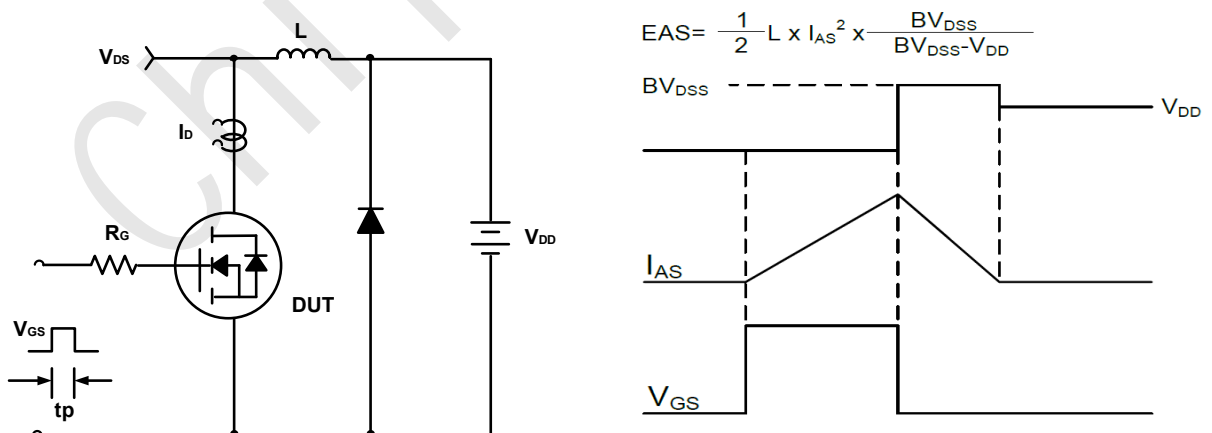


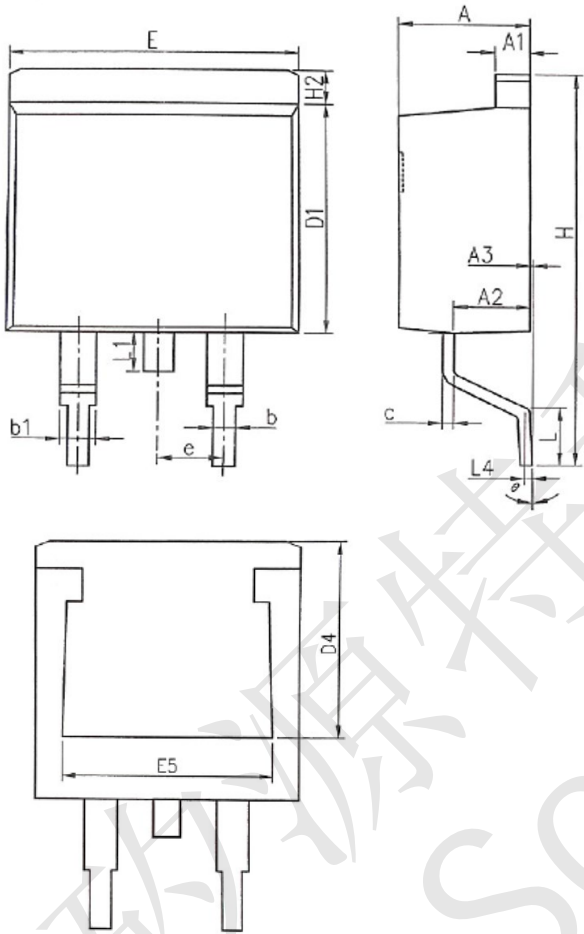
Figure B. Switching Test Circuit & Waveforms





CSTS260N10G Mechanical Dimensions for TO-263

COMMON DIMENSIONS



SYMBOL	MM	
	MIN	MAX
A	4.37	4.89
A1	1.17	1.42
A2	2.20	2.90
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.28	0.60
D1	8.45	9.30
D4	6.60	-
E	9.80	10.40
E5	7.06	-
e	2.54BSC	
H	14.70	15.70
H2	1.07	1.47
L	2.00	2.80
L1	-	1.75
L4	0.254BSC	
θ	0°	9°