



CST30P04D P-Ch 40V Fast Switching MOSFETs

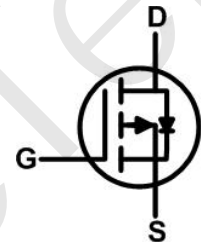
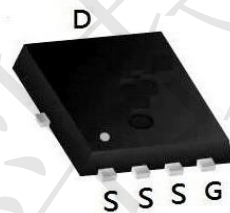
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

CST30P04D Product Summary



BVDSS	RDSON	ID
-40V	10mΩ	-30A

CST30P04D PDFN3333-8L Pin Configuration



CST30P04D Description

The CST30P04D is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The CST30P04D meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

CST30P04D Absolute Maximum Ratings (TA= 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V _{DS}	-40	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _C =25°C	I _D	-30	A
	T _C =100°C		-20	
Pulsed Drain Current ¹		I _{DM}	-120	A
Single Pulse Avalanche Energy ²		EAS	80	mJ
Total Power Dissipation	T _C =25°C	P _D	21	W
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150	°C

CST30P04D Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	R _{θJA}	64.3	°C/W
Thermal Resistance from Junction-to-Case	R _{θJC}	6	°C/W



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CST30P04D Electrical Characteristics (T_J = 25°C, unless otherwise)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-40	-	-	V	
Gate-body Leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -40V, V _{GS} = 0V	T _J =25°C	-	-	1	μA
			T _J =100°C	-	-	5	
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.6	-2.5	V	
Drain-Source On-Resistance ⁴	R _{DS(on)}	V _{GS} = -10V, I _D = -16A	-	10	13	mΩ	
		V _{GS} = -4.5V, I _D = -12A	-	14.2	20		
Forward Transconductance ⁴	g _{fs}	V _{DS} = -10V, I _D = -16A	-	44	-	S	
Dynamic Characteristics⁵							
Input Capacitance	C _{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1MHz	-	3050	-	pF	
Output Capacitance	C _{oss}		-	282	-		
Reverse Transfer Capacitance	C _{rss}		-	230	-		
Gate Resistance	R _g	f = 1MHz	-	9	-	Ω	
Switching Characteristics⁵							
Total Gate Charge	Q _g	V _{GS} = -10V, V _{DS} = -20V, I _D = -16A	-	28	-	nC	
Gate-Source Charge	Q _{gs}		-	8	-		
Gate-Drain Charge	Q _{gd}		-	8.5	-		
Turn-on Delay Time	t _{d(on)}	V _{GS} = -10V, V _{DD} = -15V, R _G = 3Ω, I _D = -16A	-	38	-	ns	
Rise Time	t _r		-	31	-		
Turn-off Delay Time	t _{d(off)}		-	90	-		
Fall Time	t _f		-	9.2	-		
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴	V _{SD}	I _S = -1A, V _{GS} = 0V	-	-	-1.2	V	
Continuous Source Current	I _S	T _C =25°C	-	-	-30	A	

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}= -25V, V_{GS}= -10V, L=0.1mH, I_{AS}= -40A.
3. The data tested by surface mounted on a 1 inch² 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..



CST30P04D Typical Characteristics

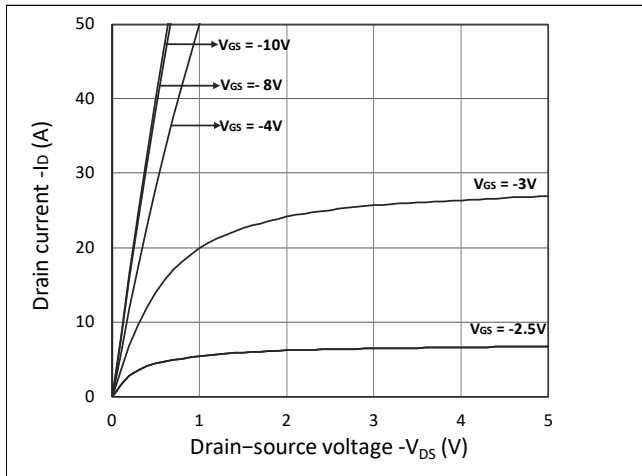


Figure 1. Output Characteristics

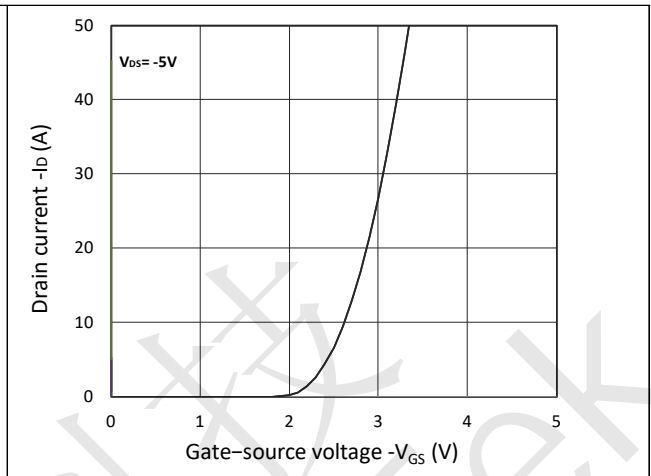


Figure 2. Transfer Characteristics

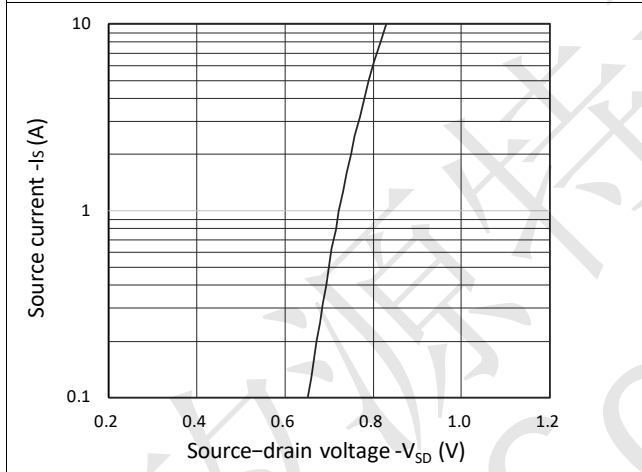


Figure 3. Forward Characteristics of Reverse

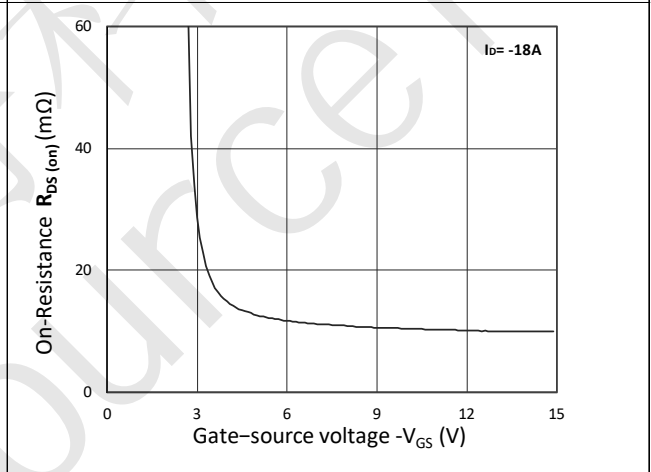


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

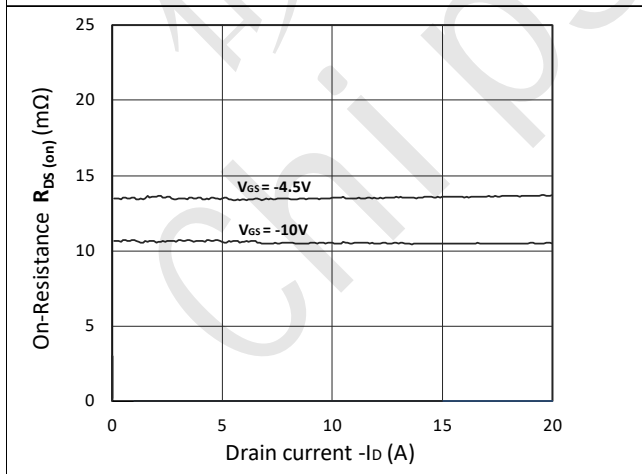


Figure 5. $R_{DS(ON)}$ vs. I_D

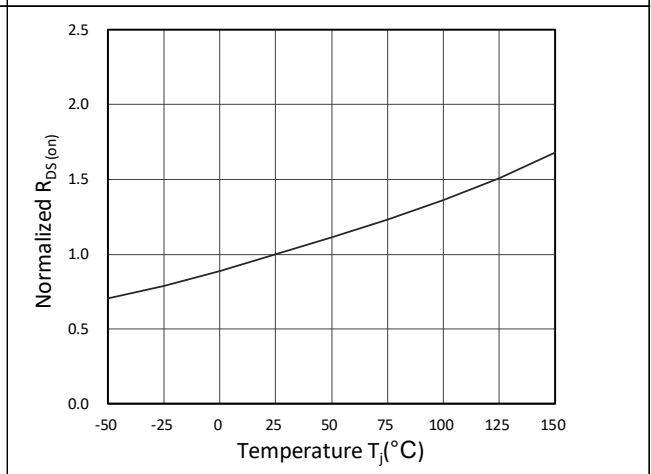


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature



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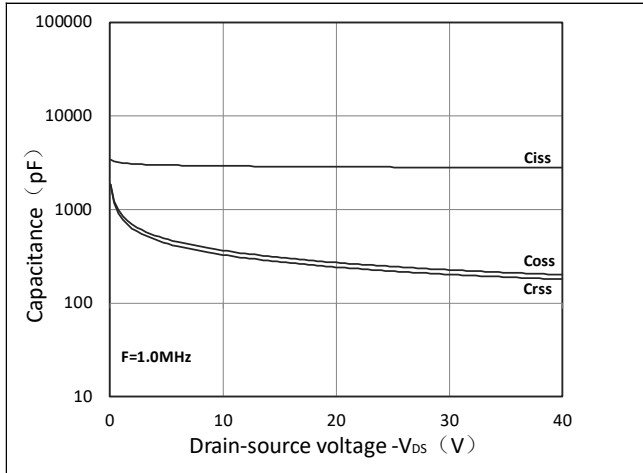


Figure 7. Capacitance Characteristics

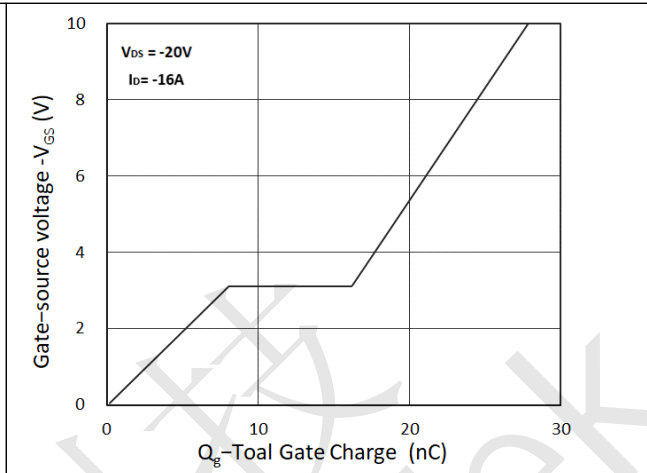


Figure 8. Gate Charge Characteristics

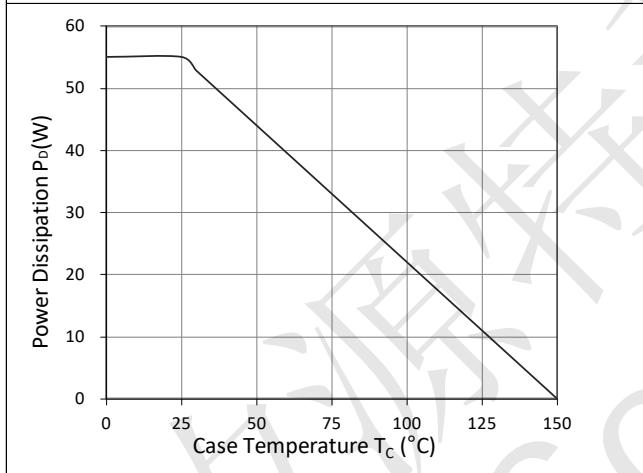


Figure 9. Power Dissipation

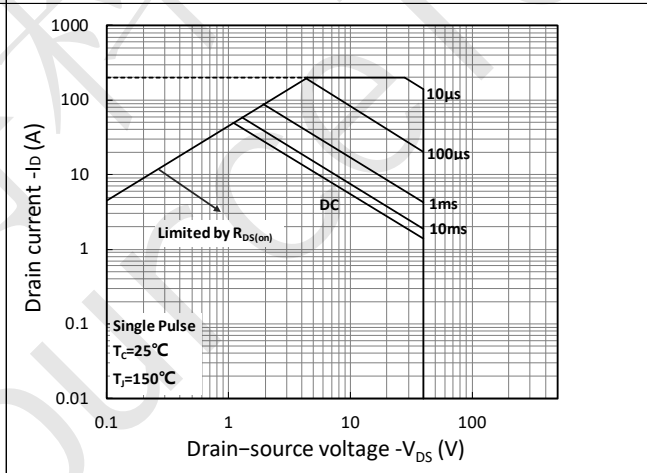


Figure 10. Safe Operating Area

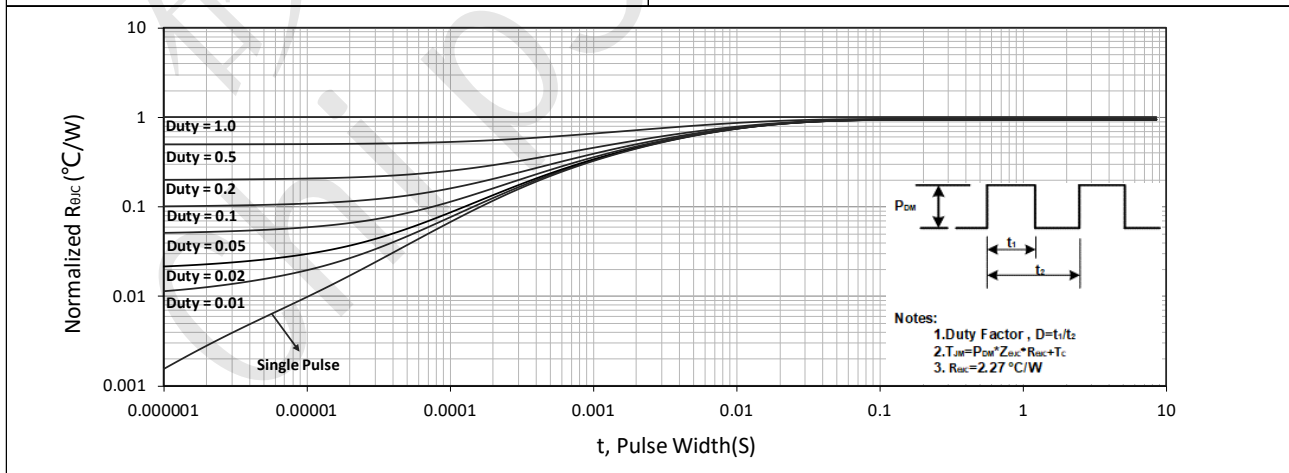
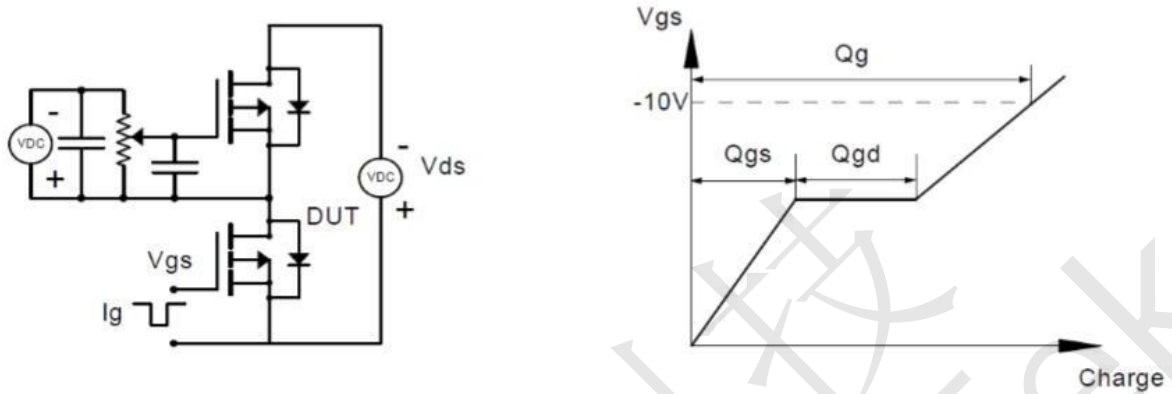


Figure 11. Normalized Maximum Transient Thermal Impedance

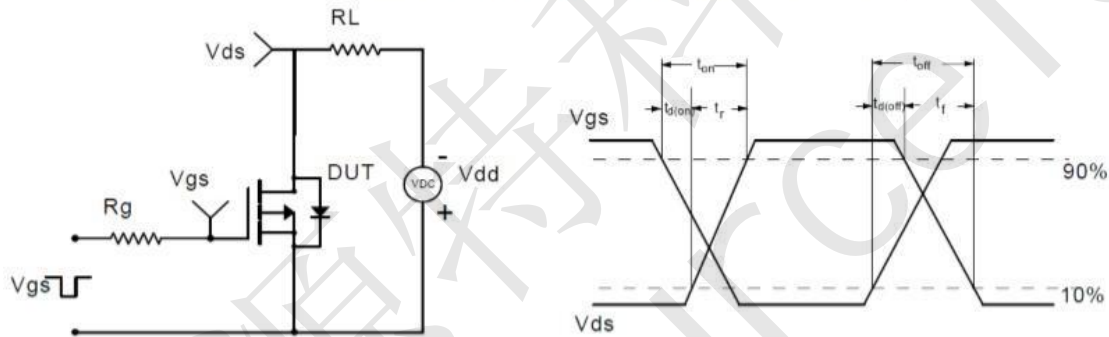


CST30P04D Test Circuit

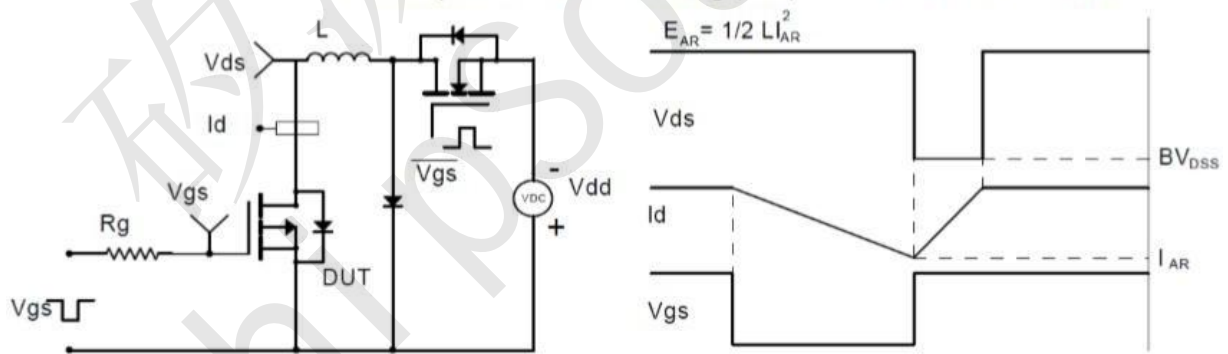
Gate Charge Test Circuit & Waveform



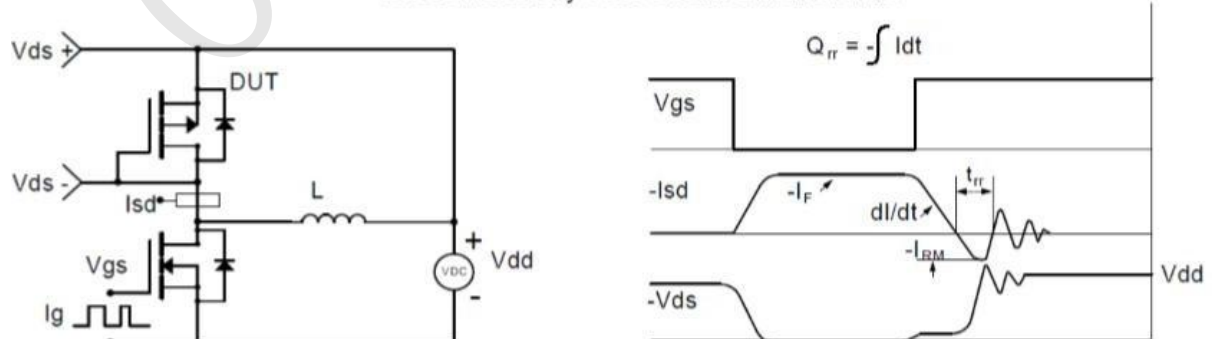
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

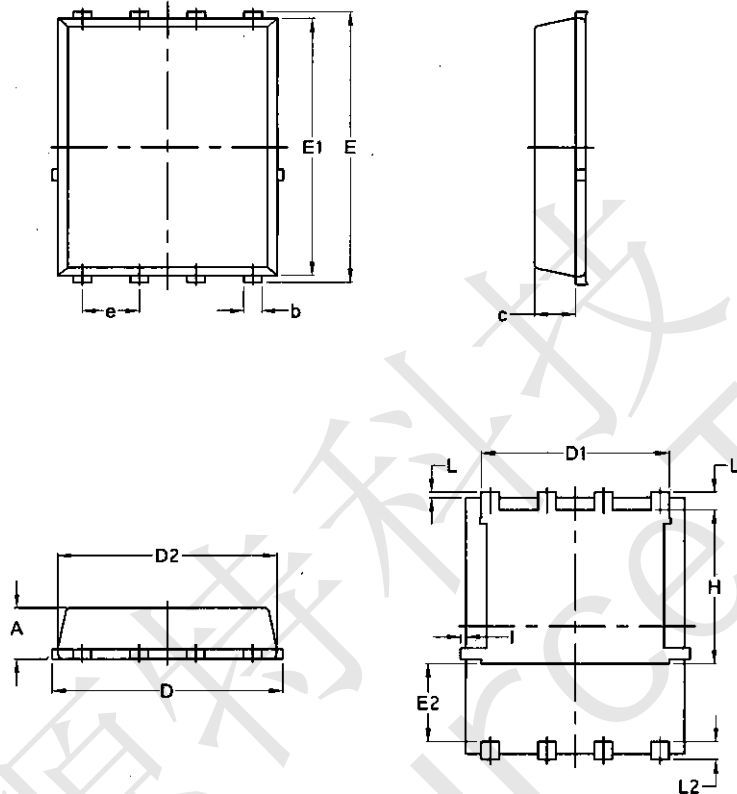


Diode Recovery Test Circuit & Waveforms





CST30P04D Package Mechanical Data-PDFN3333-8L- Single



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	0.00	0.03	0.05
b	0.24	0.30	0.35
c	0.10	0.15	0.20
D	3.25	3.32	3.40
D1	3.05	3.15	3.25
D2	2.40	2.50	2.60
E	3.00	3.10	3.20
E1	1.35	1.45	1.55
e	0.65 BSC.		
H	3.20	3.30	3.40
L	0.30	0.40	0.50
L1	0.10	0.15	0.20
L2	1.13 REF.		