

Dual P-CHANNEL ENHANCEMENT MODE POWER MOSFET

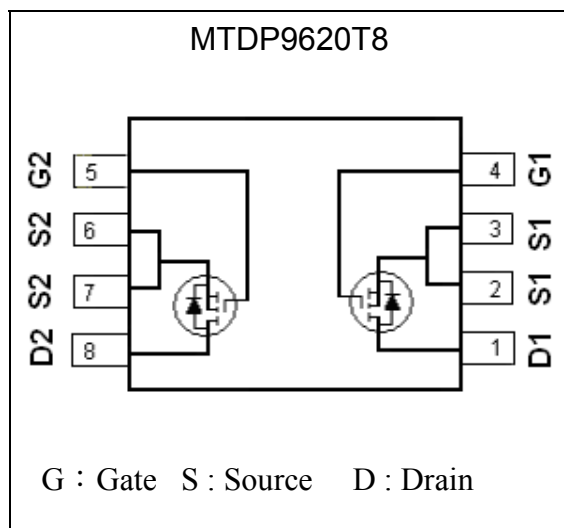
MTDP9620T8

BV_{DSS}	-20V
I_D	-6.3A
$R_{DS(on)}@V_{GS}=-4.5V, I_D=-4.8A$	20m Ω (typ)
$R_{DS(on)}@V_{GS}=-2.5V, I_D=-4.2A$	26m Ω (typ)
$R_{DS(on)}@V_{GS}=-1.8V, I_D=-3.5A$	34m Ω (typ)

Features

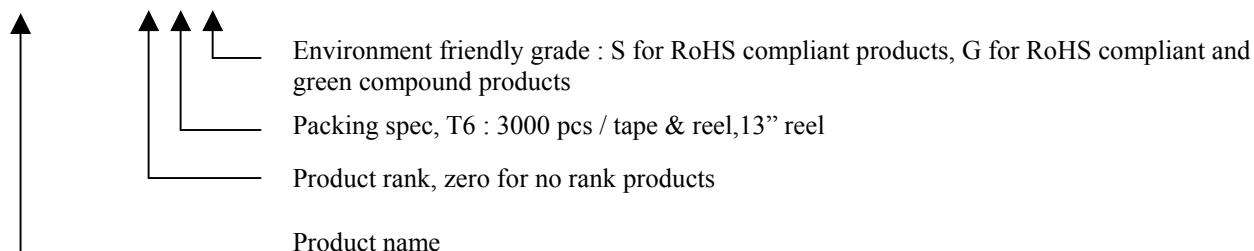
- 1.8V drive available
- Low on-resistance
- Fast switching speed
- Pb-free lead plating and halogen-free package

Equivalent Circuit



Ordering Information

Device	Package	Shipping
MTDP9620T8-0-T6-G	TSSOP-8 (Pb-free lead plating and halogen-free package)	3000 pcs/ Tape & Reel



**Absolute Maximum Ratings** (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Breakdown Voltage		BV _{DSS}	-20	V
Gate-Source Voltage		V _{GS}	±12	
Continuous Drain Current (Note 1)	T _A =25°C	I _D	-6.3	A
	T _A =70°C		-5	
Pulsed Drain Current (Note 2)		I _{DM}	-30	
Total Power Dissipation (Note 1)	T _A =25°C	P _D	1	W
	T _A =70°C		0.64	
Operating Junction and Storage Temperature Range		T _j ; T _{stg}	-55~+150	°C
Thermal Resistance, Junction-to-Ambient (Note 1)		R _{th,ja}	125	°C/W

Note : 1.Surface mounted on 1 in ² copper pad of FR-4 board, t≤10sec. The value in any given application depends on the user's specific board design.

2.Pulse width ≤300μs, Duty Cycle≤2%

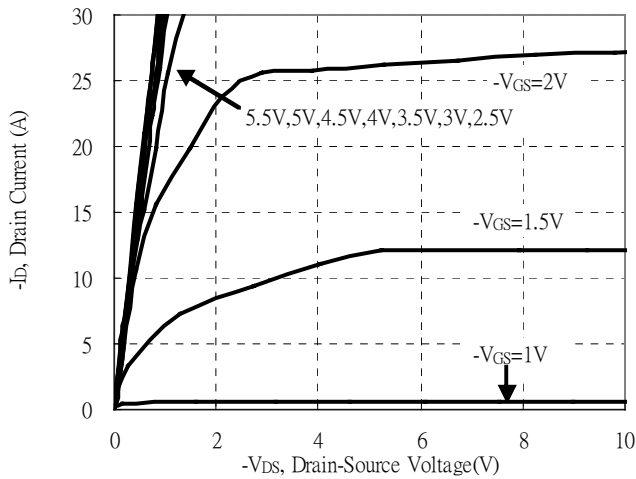
Electrical Characteristics (T_j=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-20	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-0.4	-0.53	-0.8	V	V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±12V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-20V, V _{GS} =0V
	-	-	-25		V _{DS} =-16V, V _{GS} =0V, T _j =125°C
*R _{DS(ON)}	-	20	28	mΩ	I _D =-4.8A, V _{GS} =-4.5V
	-	26	35		I _D =-4.2A, V _{GS} =-2.5V
	-	34	45		I _D =-3.5A, V _{GS} =-1.8V
*G _{FS}	-	17	-	S	V _{DS} =-5V, I _D =-4.8A
Dynamic					
C _{iss}	-	2754	-	pF	V _{DS} =-10V, V _{GS} =0, f=1MHz
C _{oss}	-	264	-		
C _{rss}	-	223	-		
*t _{d(ON)}	-	17	-	ns	V _{DD} =-10V, I _D =-1A, V _{GS} =-4.5V, R _G =6Ω
*t _r	-	28	-		
*t _{d(OFF)}	-	90	-		
*t _f	-	75	-		
*Q _g	-	18.4	-	nC	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-4.8A
*Q _{gs}	-	4.7	-		
*Q _{gd}	-	6.6	-		
Source Drain Diode					
*I _S	-	-	-4.8	A	
*I _{SM}	-	-	-20		
*V _{SD}	-	-0.83	-1.2	V	V _{GS} =0V, I _S =-4.8A
*trr	-	35	-	ns	I _F =-4.8A, dI _F /dt=100A/μs
*Q _{rr}	-	60	-	nC	

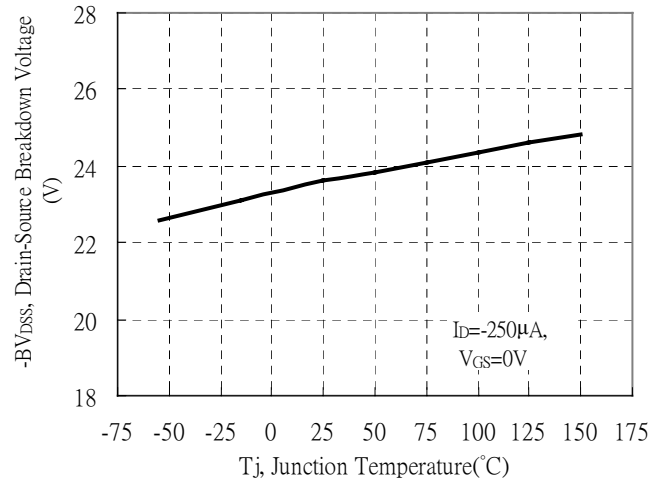
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

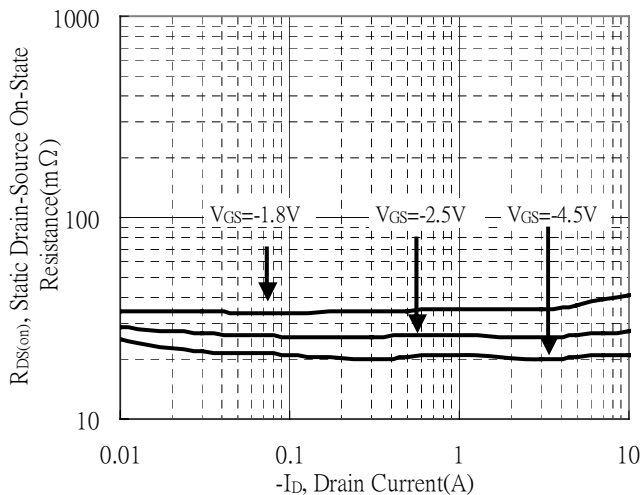
Typical Output Characteristics



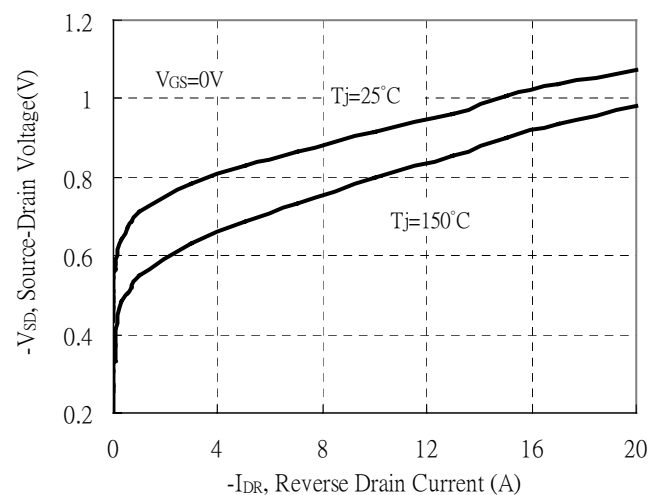
Brekdown Voltage vs Ambient Temperature



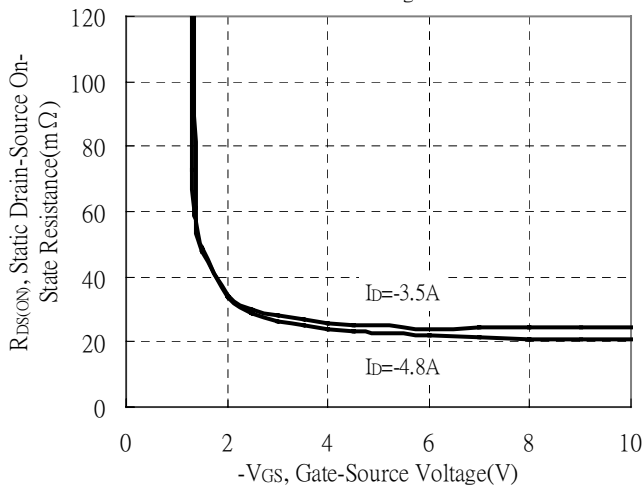
Static Drain-Source On-State resistance vs Drain Current



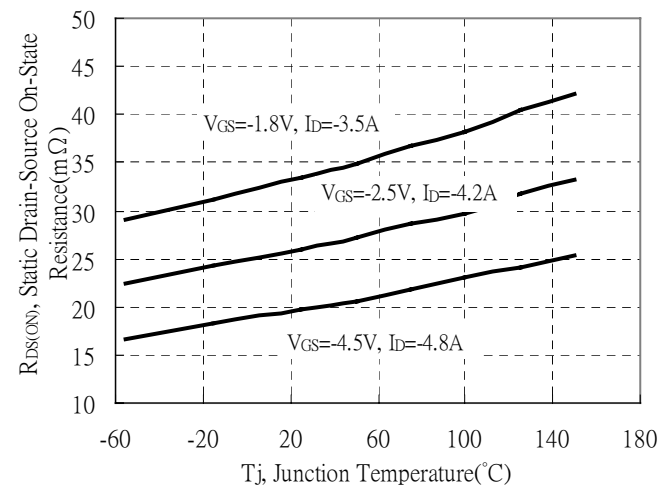
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

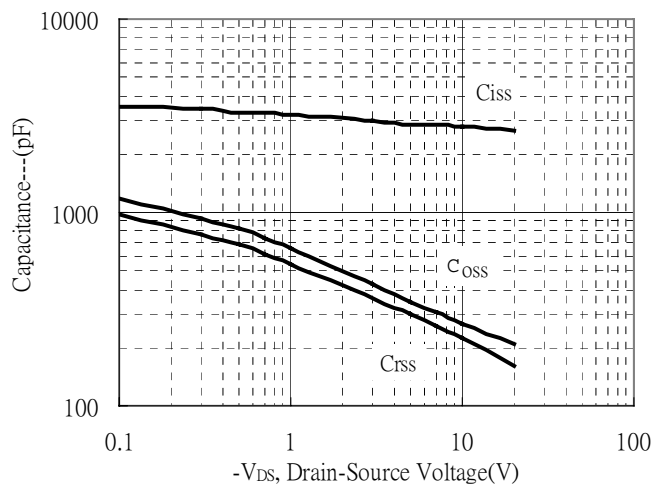


Drain-Source On-State Resistance vs Junction Temperature

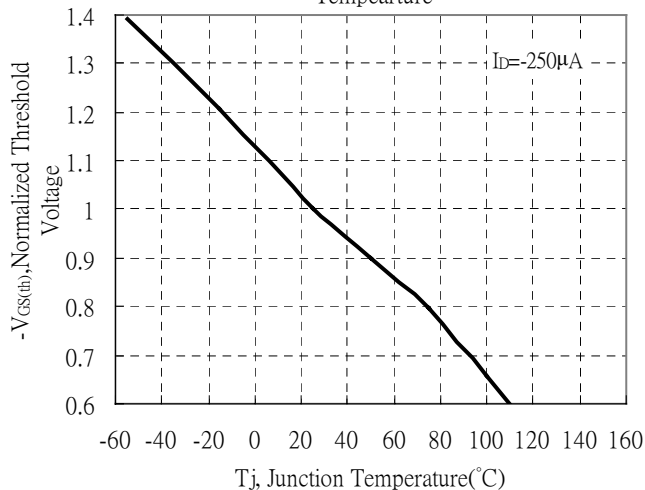


Typical Characteristics(Cont.)

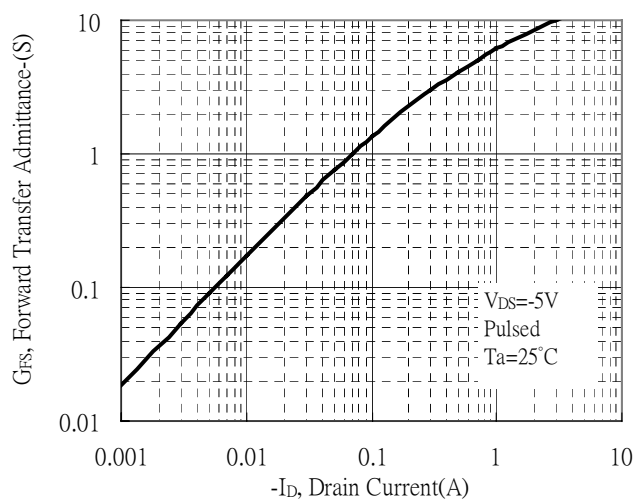
Capacitance vs Drain-to-Source Voltage



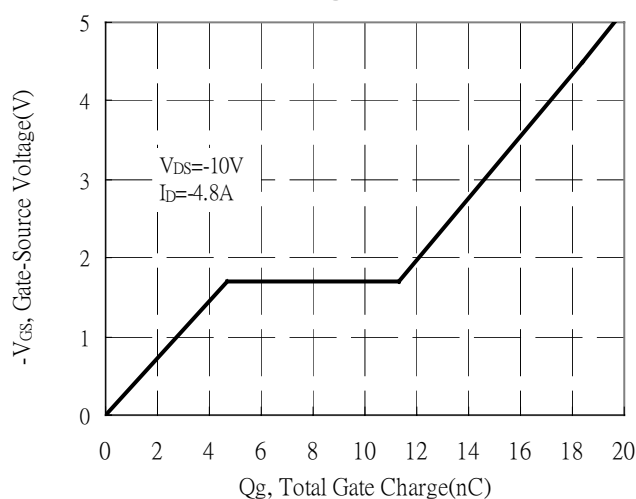
Normalized Threshold Voltage vs Junction Temperature



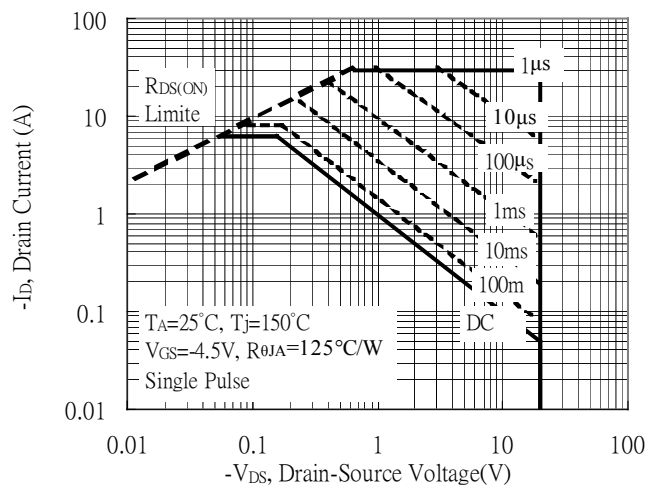
Forward Transfer Admittance vs Drain Current



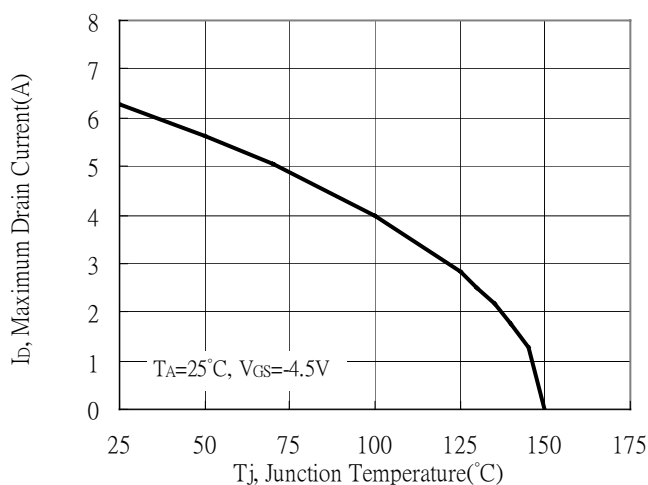
Gate Charge Characteristics



Maximum Safe Operating Area

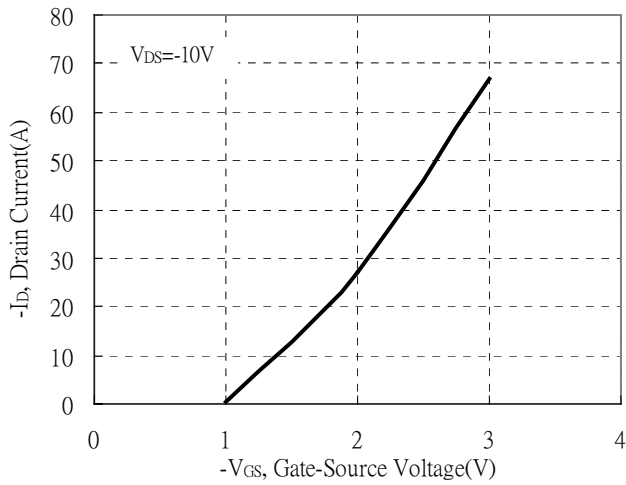


Maximum Drain Current vs Junction Temperature

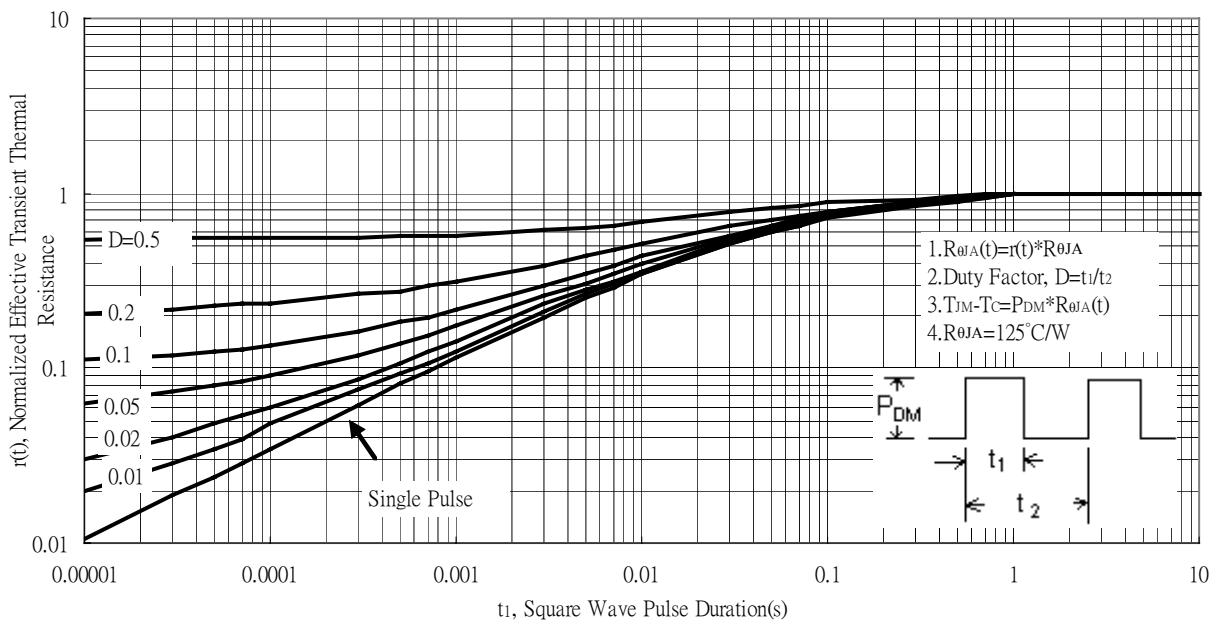


Typical Characteristics(Cont.)

Typical Transfer Characteristics



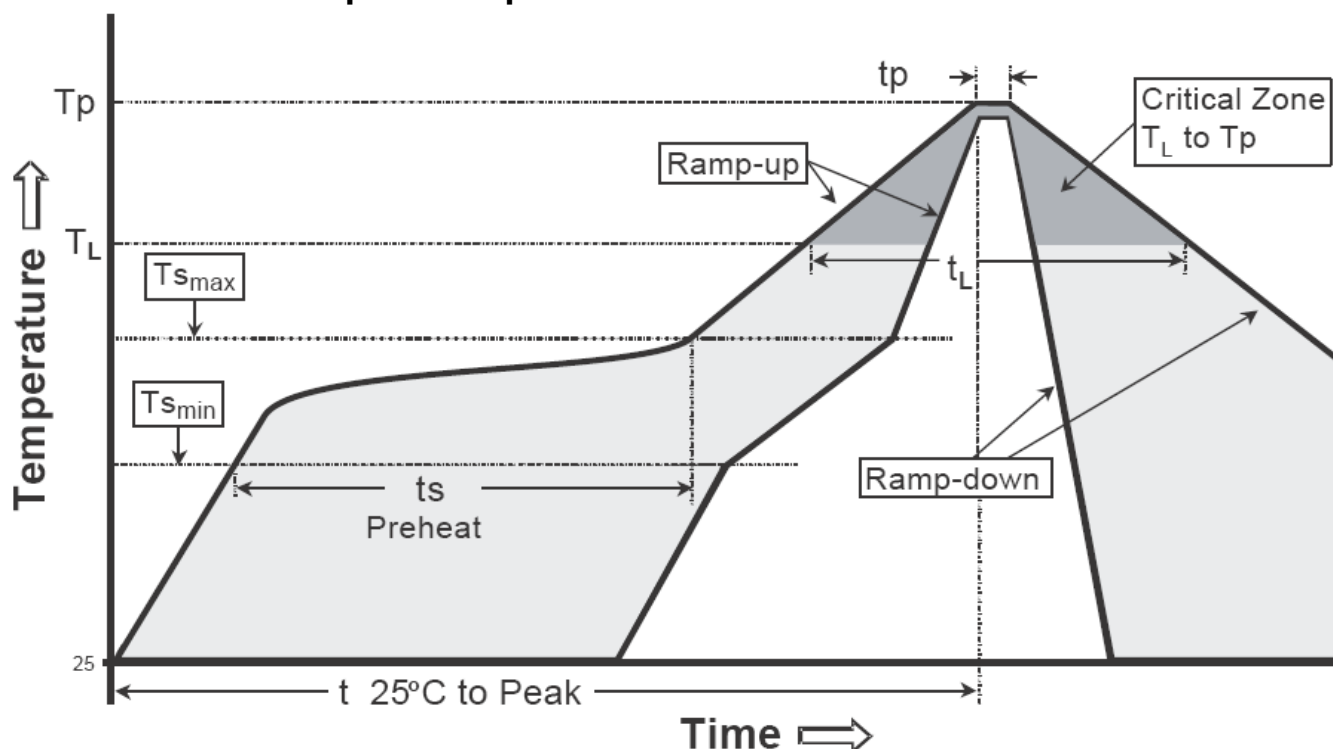
Transient Thermal Response Curves



Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

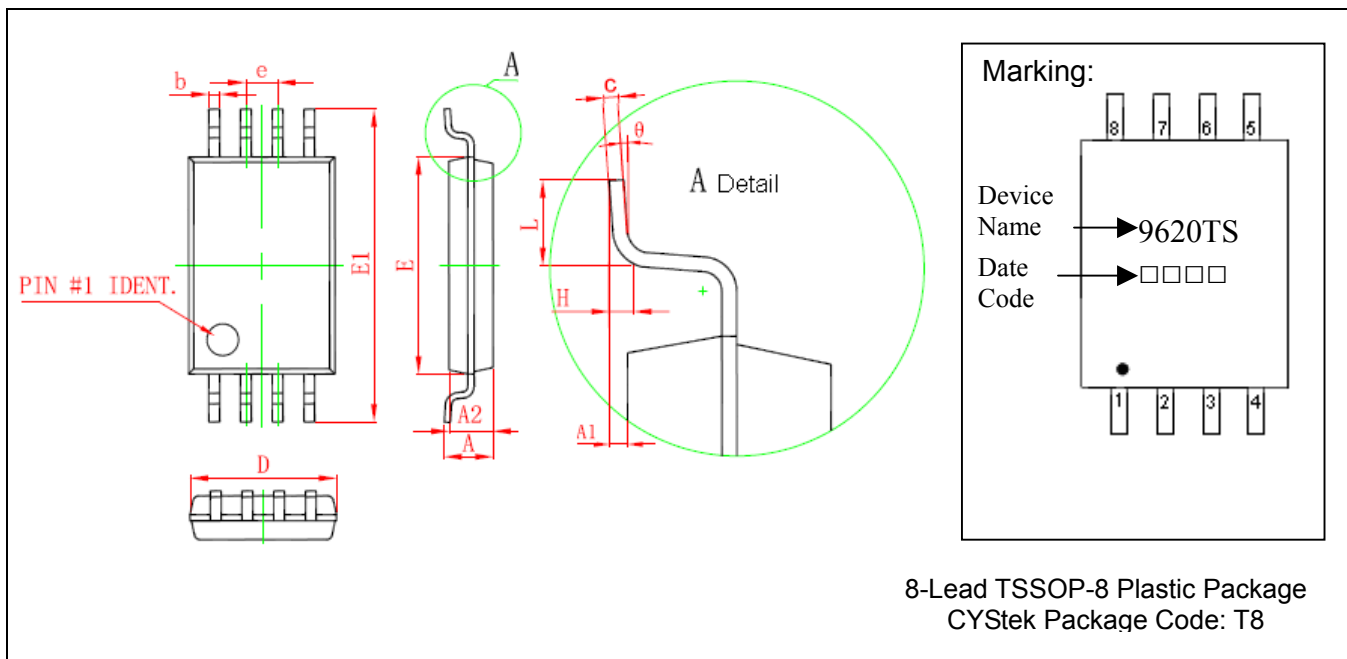
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (Tl)	183°C	217°C
- Time (tL)	60-150 seconds	60-150 seconds
Peak Temperature(Tp)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

TSSOP-8 Dimension



*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.200	-	0.047	E	4.300	4.500	0.169	0.177
A1	0.020	0.150	0.001	0.006	E1	6.250	6.550	0.246	0.258
A2	0.800	1.000	0.031	0.039	e	0.650	(BSC)	0.026	(BSC)
b	0.190	0.300	0.007	0.012	L	0.500	0.700	0.020	0.028
c	0.090	0.200	0.004	0.008	H	0.250*		0.010*	
D	2.900	3.100	0.114	0.122	θ	1°	7°	1°	7°

Notes: 1. Controlling dimension: millimeters.

2. Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

3. If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek **semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.