

## 100 V DMOS SWITCHES

ADVANCE DATA

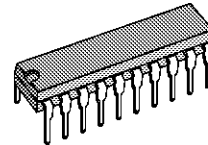
- OUTPUT VOLTAGE TO 100V
- $0,5\Omega$   $R_{DS(on)}$
- SUPPLY VOLTAGE UP TO 60V
- LOW INPUT CURRENT
- TTL/CMOS COMPATIBLE INPUTS
- HIGH SWITCHING FREQUENCY (200kHz)

### DESCRIPTION

Realized with the Multipower-BCD mixed bipolar/CMOS/DMOS process, the L6122/23 monolithic three DMOS switch is designed for high current, high voltage switching applications. Each of the three switches is controlled by a logic input and all three are controlled by a common enable input. All inputs are TTL/CMOS compatible for direct connection to logic circuits. Each source is available for the insertion of the sense resistors in current control applications.

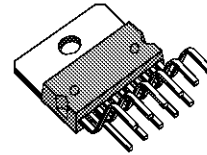
Two versions are available : the L6122 mounted in a Powerdip 14 + 3 + 3 package and the L6123 in a 15-lead Multiwatt package.

### MULTIPOWER BCD TECHNOLOGY



**Powerdip 14+3+3**  
(Plastic Package)

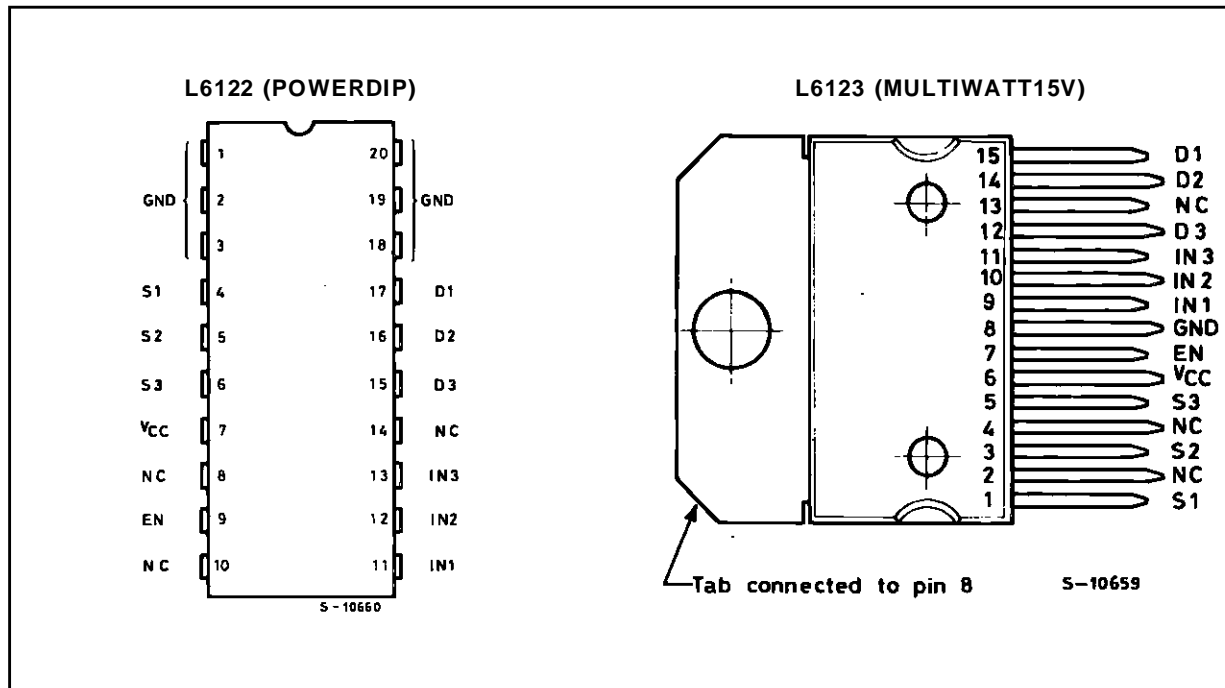
ORDERING NUMBER : L6122



**MULTIWATT15V**  
(Plastic Package)

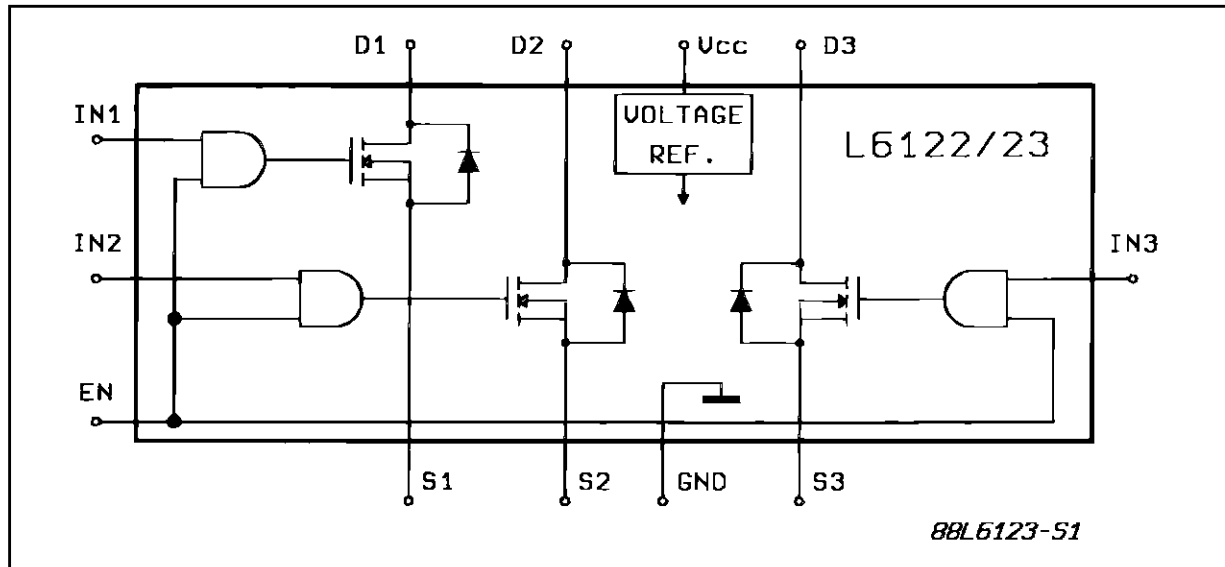
ORDERING NUMBER : L6123

### PIN CONNECTIONS (top view)



# L6122 - L6123

## BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{DS}$	Drain-source Voltage	100	V
$V_{CC}$	Supply Voltage	60	V
$I_D$	Continuous Drain Current @ $T_{pins} = 90\text{ }^{\circ}\text{C}$ , POWERDIP @ $T_{case} = 90\text{ }^{\circ}\text{C}$ , MULTIWATT	1.5 3	A A
$I_{DM} (*)$	Pulsed Drain Current POWERDIP MULTIWATT	5 8	A A
$I_{SD}$	Continuous Source-drain Diode Current @ $T_{pins} = 90\text{ }^{\circ}\text{C}$ , POWERDIP @ $T_{case} = 90\text{ }^{\circ}\text{C}$ , MULTIWATT	1.5 3	A A
$I_{SDM}$	Pulsed Source Drain Diode Current POWERDIP MULTIWATT	5 8	A A
$V_{IN}$	Input Voltage	7	V
$V_{EN}$	Enable Voltage	7	V
$V_S$	Source Voltage	- 1 to + 4	V
$P_{tot}$	Total Power Dissipation @ $T_{pins} = 90\text{ }^{\circ}\text{C}$ , POWERDIP @ $T_{case} = 90\text{ }^{\circ}\text{C}$ , MULTIWATT @ $T_{amb} = 70\text{ }^{\circ}\text{C}$ , POWERDIP @ $T_{amb} = 70\text{ }^{\circ}\text{C}$ , MULTIWATT	4.3 20 1.3 2.3	W W W W
$T_{stg}, T_j$	Storage and Junction Temperature Range	- 40 to + 150	$^{\circ}\text{C}$

(\*) Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 10\%$ .

**NOTE** :  $I_D, I_{DM}, I_{SD}, I_{SDM}$  are given per channel.

## THERMAL DATA

Symbol	Parameter	POWERDIP14+3+3	MULTIWATT15	Unit
$R_{th\ j-pins}$	Thermal Resistance Junction-pins Max.	14	-	$^{\circ}\text{C}/\text{W}$
$R_{th\ j-case}$	Thermal Resistance Junction-case Max.	-	3	$^{\circ}\text{C}/\text{W}$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient Max.	65	35	$^{\circ}\text{C}/\text{W}$

**ELECTRICAL CHARACTERISTICS** ( $T_j = 25^\circ\text{C}$ ,  $V_{CC} = 40\text{V}$ , unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{CC}$	Supply Voltage		14		48	V
$I_{CC}$	Supply Current	All $V_{IN} = H$ $V_{EN} = \text{Square Wave (200kHz, 50% DC)}$		9		mA
$I_Q$	Quiescent Current	$V_{EN} = L$		2	3	mA
$BV_{DSS}$	Drain Source Breakdown Voltage	$I_D = 1\text{mA}$ $V_{EN} = L$	100			V
$I_{DSS}$	Output Leakage Current	$V_{EN} = L$ $V_{DS} = 100\text{V}$ $V_{DS} = 80\text{V}, T_j = 125^\circ\text{C}$		1	1	mA
$R_{DS(on)}^*$	Static Drain-source on Resistance	$V_{CC} \geq 14\text{V}, I_D = 1.5\text{A} - V_{EN}, V_{IN} = H$		0.7		$\Omega$
$V_{INL}, V_{ENL}$	Input Low Voltage		-0.3		0.8	V
$V_{INH}, V_{ENH}$	Input High Voltage		2		7	V
$I_{INL}, I_{ENL}$	Input Low Current	$V_{IN}, V_{EN} = L$			-100	$\mu\text{A}$
$I_{INH}, I_{ENH}$	Input High Current	$V_{IN}, V_{EN} = H$			10	$\mu\text{A}$
$t_{d(on)}$	Turn on Delay Time	$I_D = 1.5\text{A}$ See Test Circuit and Waveforms		300		ns
$t_r$	Rise Time			100		ns
$t_{d(off)}$	Turn off Delay Time			400		ns
$t_f$	Fall Time			100		ns
$V_{SD}^*$	Source Drain Diode Forward Voltage	$I_{SD} = 1.5\text{A}, V_{EN} = L$			1.5	V
$V_{SD(on)}^*$	Source Drain Forward Voltage	$I_{SD} = 1.5\text{A} - V_{IN}, V_{EN} = H$			1.2	V

(\*) Pulse test : pulse width = 300  $\mu\text{s}$ , duty cycle = 2 %.

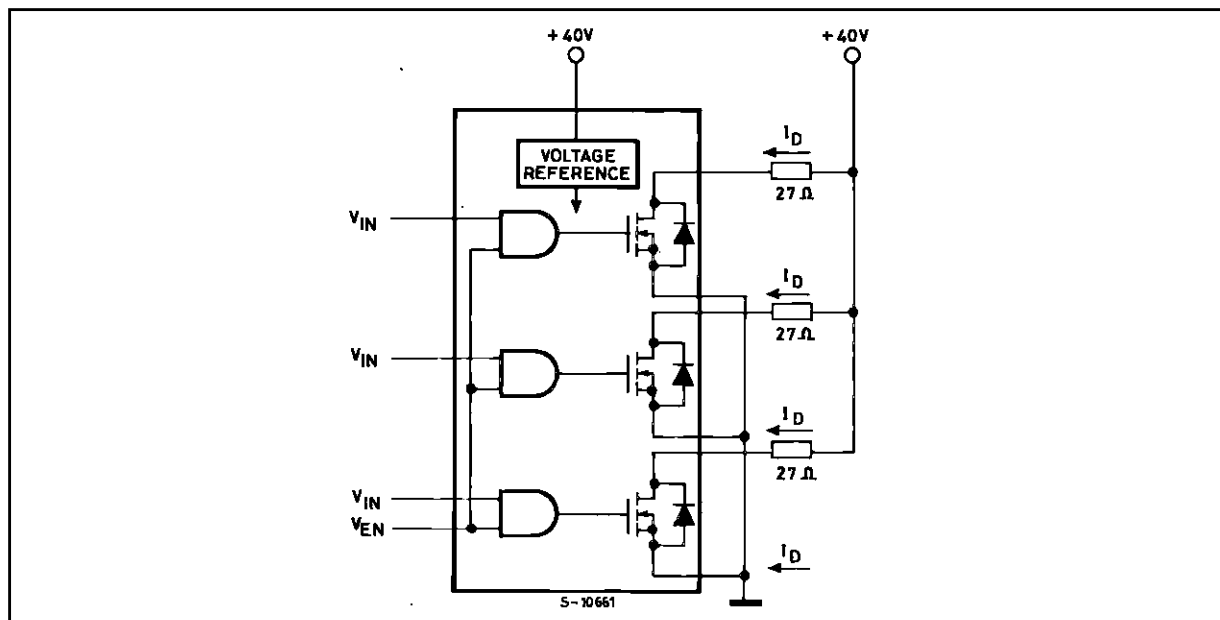
**SWITCHING TIMES RESISTIVE LOAD****Figure 1 : Test Circuit.**

Figure 2 : Waveforms.

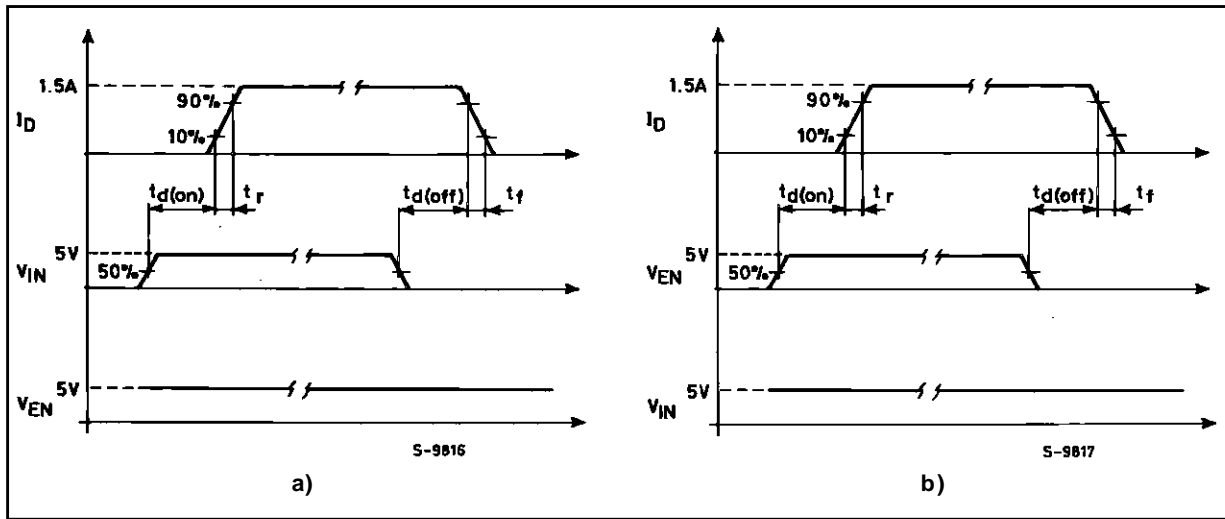


Figure 3 : Static Drain-source on Resistance.

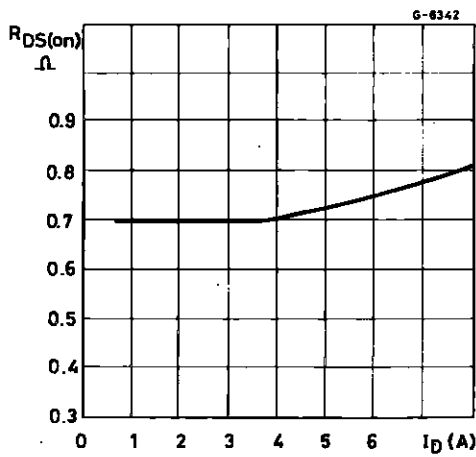


Figure 5 : Normalized on Resistance vs. Temperature.

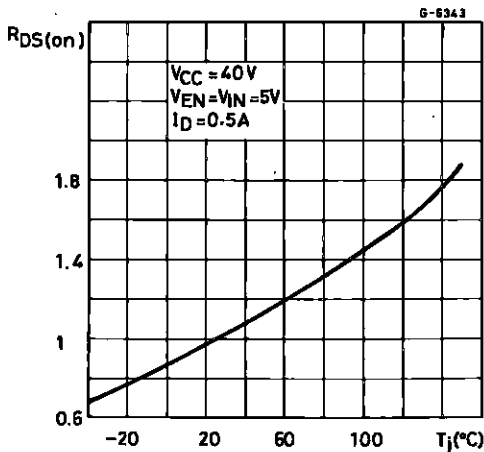


Figure 4 : Normalized Breakdown Voltage vs. Temperature.

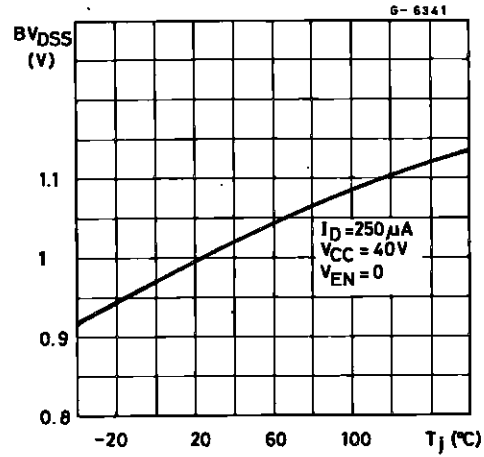


Figure 6 : Typical Source-drain Diode Forward Voltage.

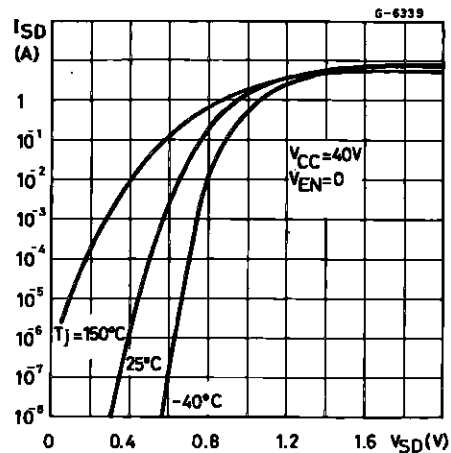
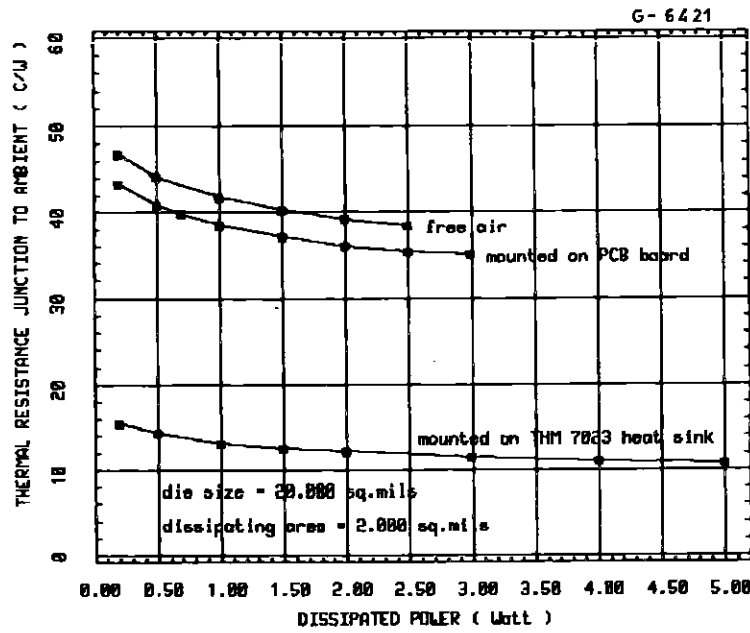


Figure 7 :  $R_{th\ j-amb}$  vs. Dissipated Power (Multiwatt).



(\*)  $R_{th} \approx 9^{\circ}C/W$

Figure 8 : Transient Thermal Resistance for Single Pulses (Multiwatt).

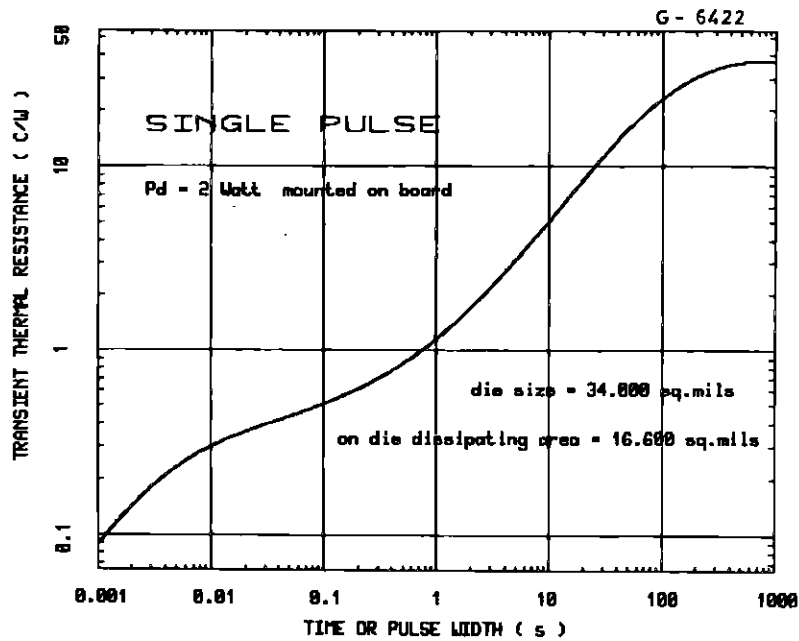
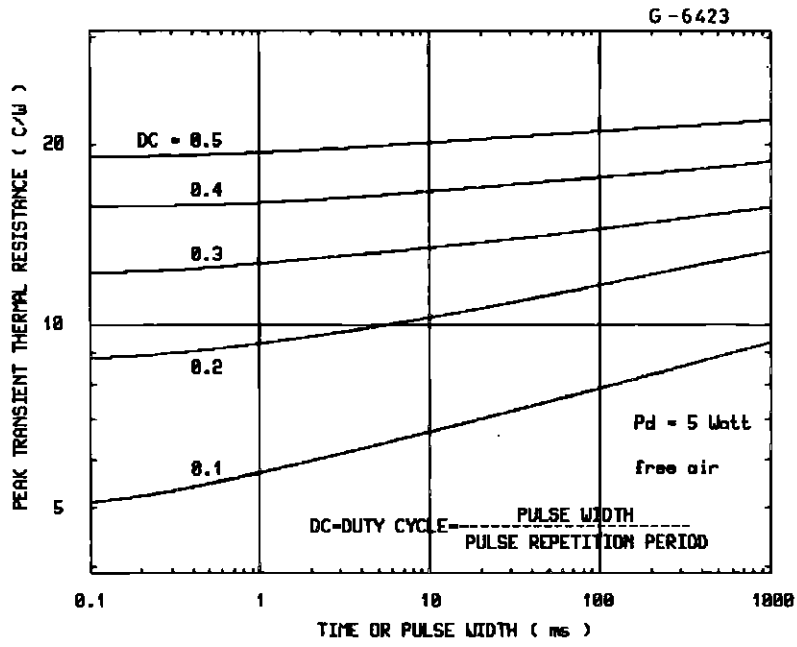
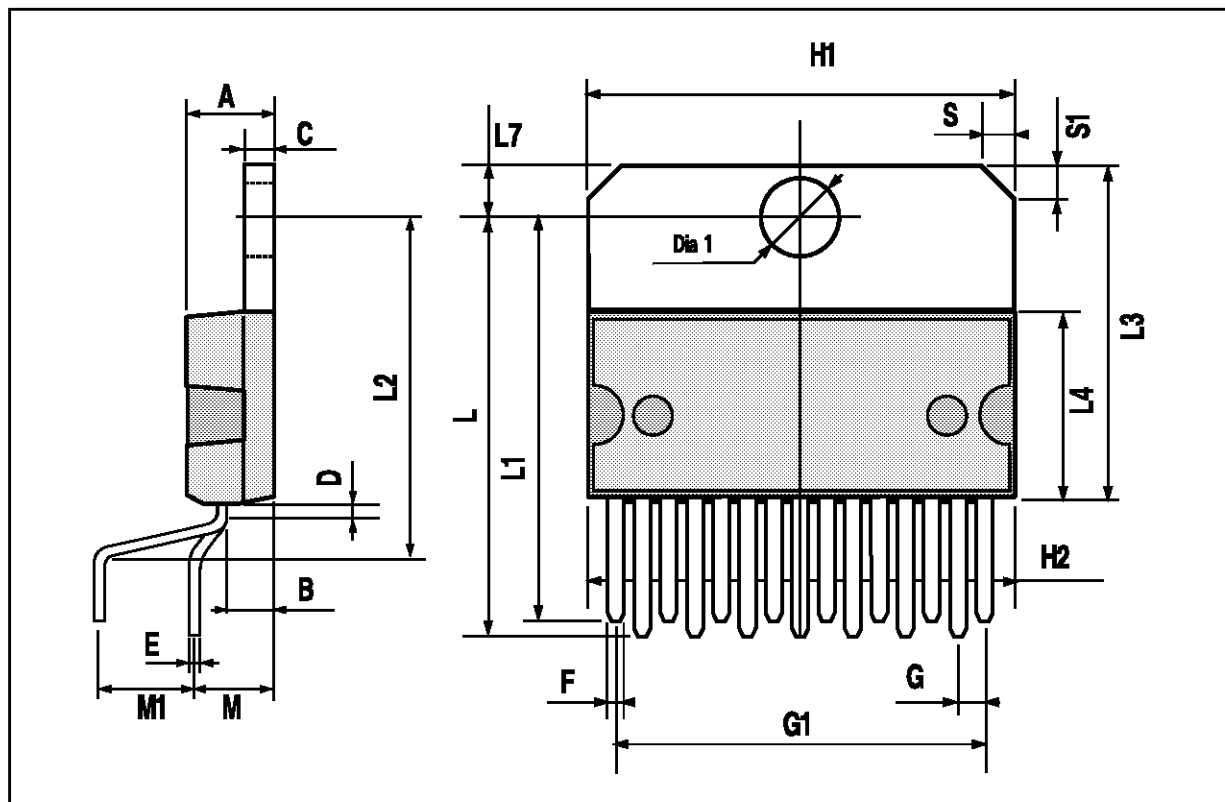


Figure 9 : Peak Transient Thermal Resistance vs. Pulse Width and Duty Cycle (Multiwatt).



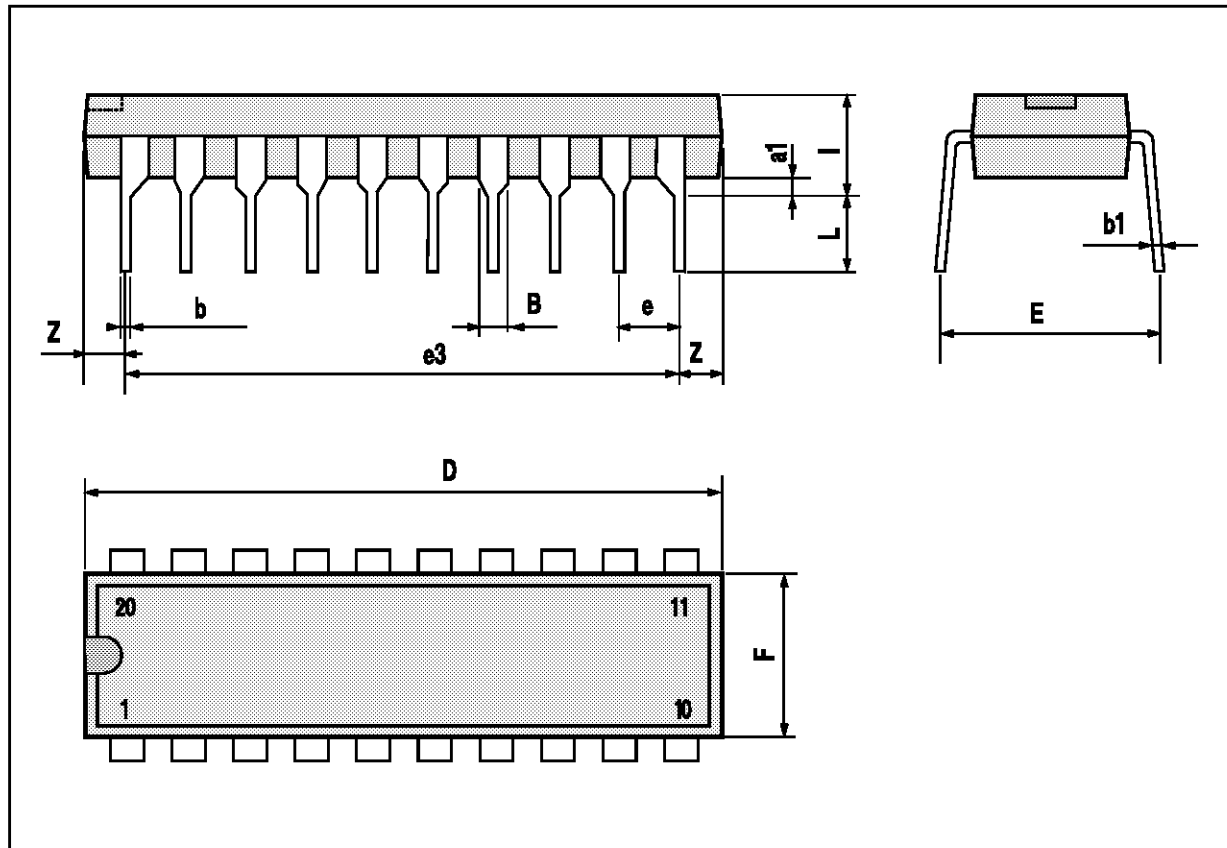
## MULTIWATT15 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1	19.6			0.772		
H2			20.2			0.795
L	22.1		22.6	0.870		0.890
L1	22		22.5	0.866		0.886
L2	17.65		18.1	0.695		0.713
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
M	4.2	4.3	4.6	0.165	0.169	0.181
M1	4.5	5.08	5.3	0.177	0.200	0.209
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152



POWERDIP20 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.85		1.40	0.033		0.055
b		0.50			0.020	
b1	0.38		0.50	0.015		0.020
D			24.80			0.976
E		8.80			0.346	
e		2.54			0.100	
e3		22.86			0.900	
F			7.10			0.280
I			5.10			0.201
L		3.30			0.130	
Z			1.27			0.050



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved  
MULTIWATT® is a Registered Trademark of SGS-THOMSON Microelectronics

SGS-THOMSON Microelectronics GROUP OF COMPANIES  
Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands - Singapore -  
Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.