

100 V DMOS SWITCHES

ADVANCE DATA

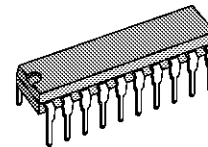
- OUTPUT VOLTAGE TO 100V
- $0,5\Omega$ $R_{DS(on)}$
- SUPPLY VOLTAGE UP TO 60V
- LOW INPUT CURRENT
- TTL/CMOS COMPATIBLE INPUTS
- HIGH SWITCHING FREQUENCY (200kHz)

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.

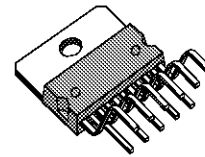
Two versions are available : the L6122 mounted in a Powerdip 14 + 3 + 3 package and the L6123 in a 15-lead Multiwatt package.

MULTIPOWER BCD TECHNOLOGY



Powerdip 14+3+3
(Plastic Package)

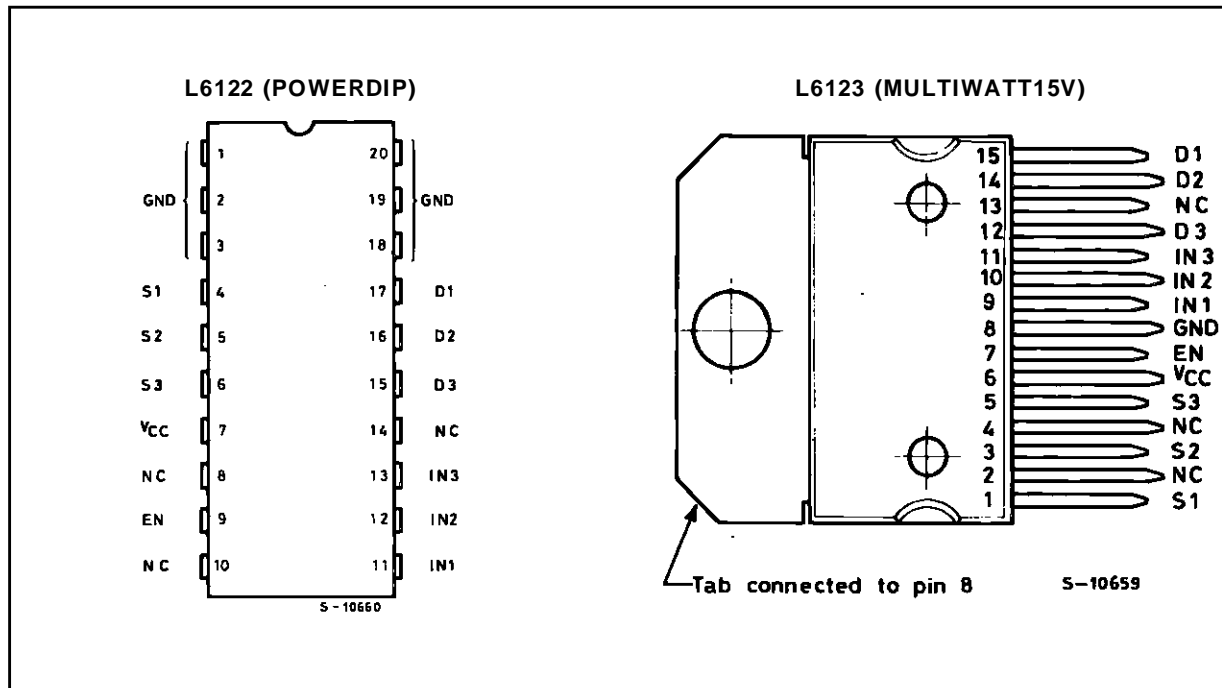
ORDERING NUMBER : L6122



MULTIWATT15V
(Plastic Package)

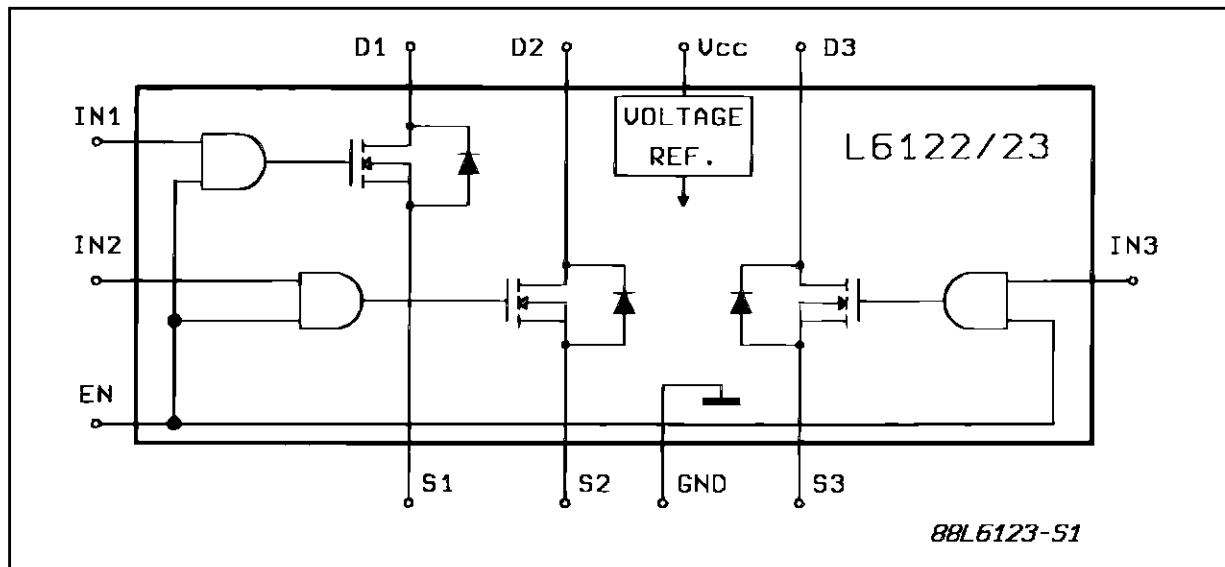
ORDERING NUMBER : L6123

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
$I_{DM} (*)$	Pulsed Drain Current POWERDIP MULTIWATT	5 8	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
I_{SDM}	Pulsed Source Drain Diode Current POWERDIP MULTIWATT	5 8	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
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		Ω
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	μA
I_{INH}, I_{ENH}	Input High Current	$V_{IN}, V_{EN} = H$			10	μA
$t_{d(on)}$	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 μs , duty cycle = 2 %.

SWITCHING TIMES RESISTIVE LOAD

Figure 1 : Test Circuit.

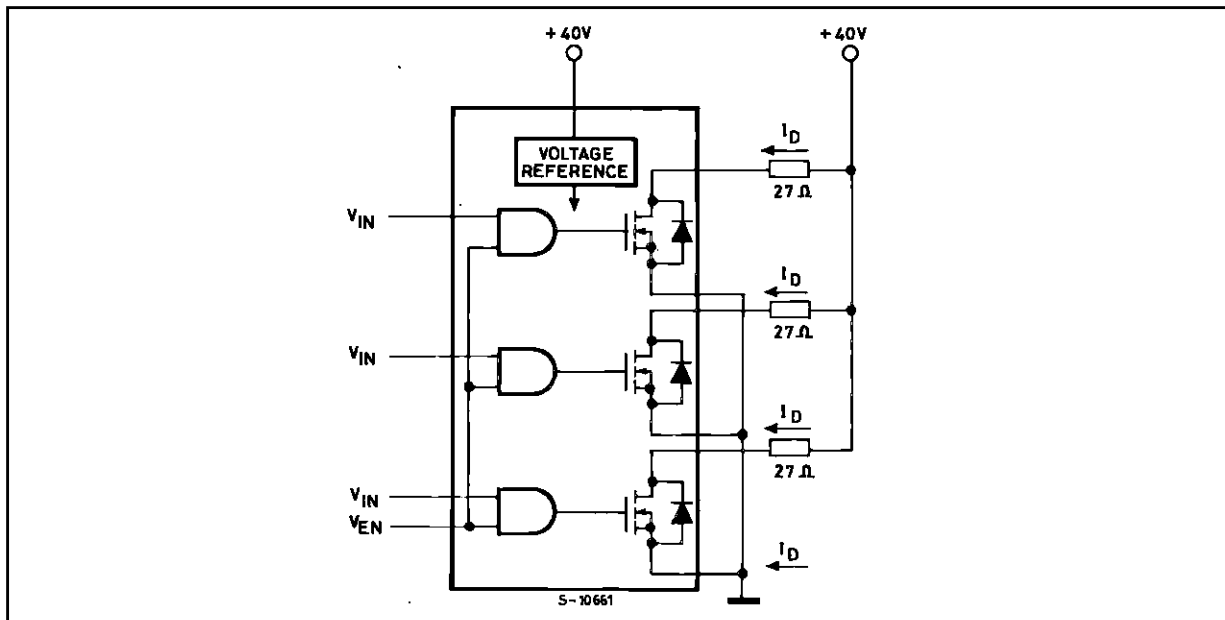


Figure 2 : Waveforms.

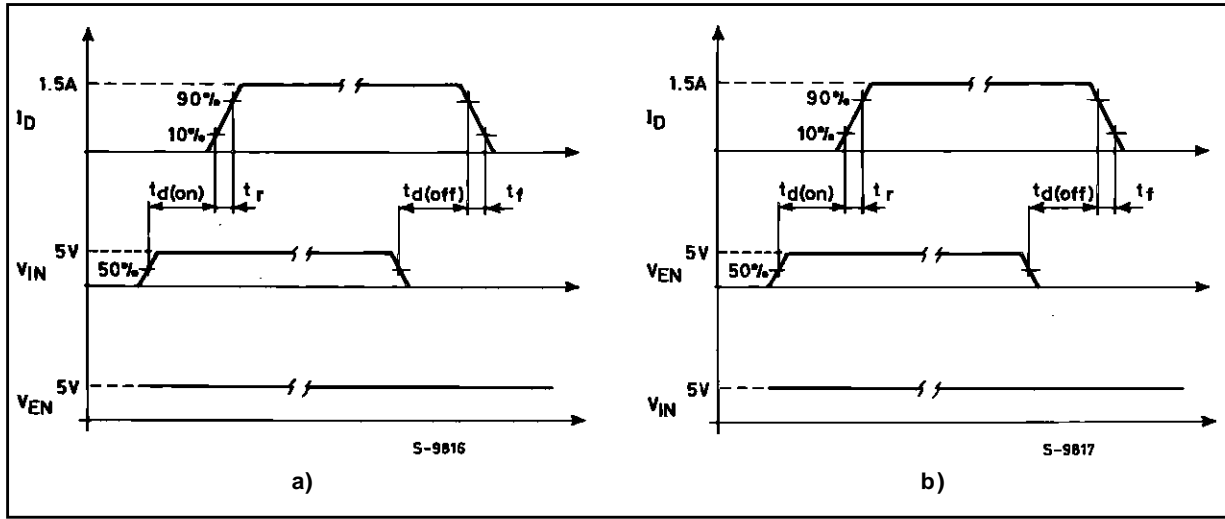


Figure 3 : Static Drain-source on Resistance.

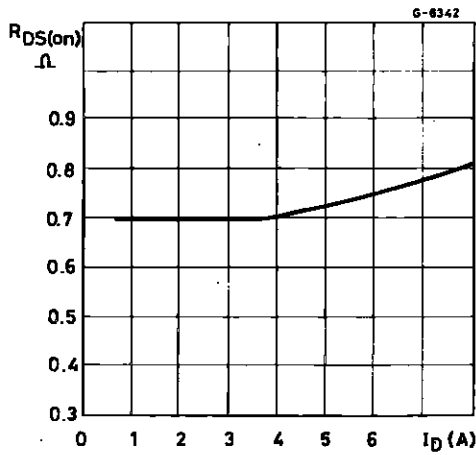


Figure 5 : Normalized on Resistance vs. Temperature.

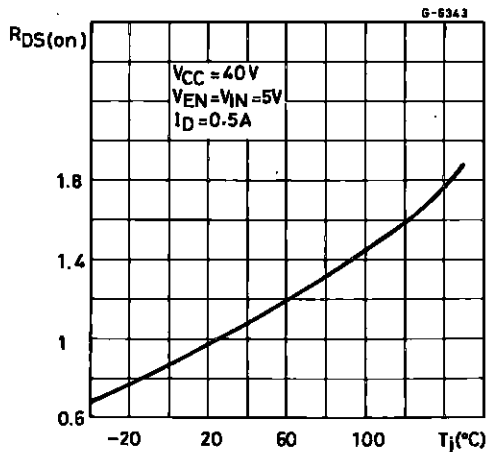


Figure 4 : Normalized Breakdown Voltage vs. Temperature.

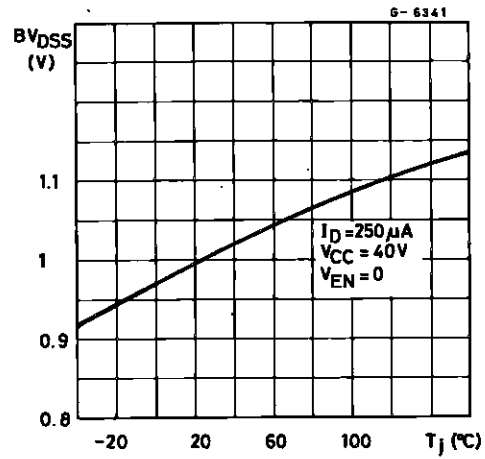


Figure 6 : Typical Source-drain Diode Forward Voltage.

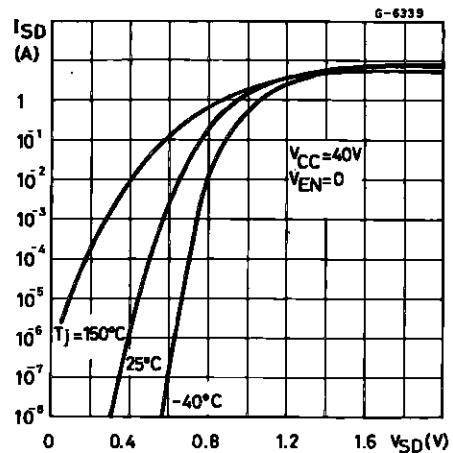
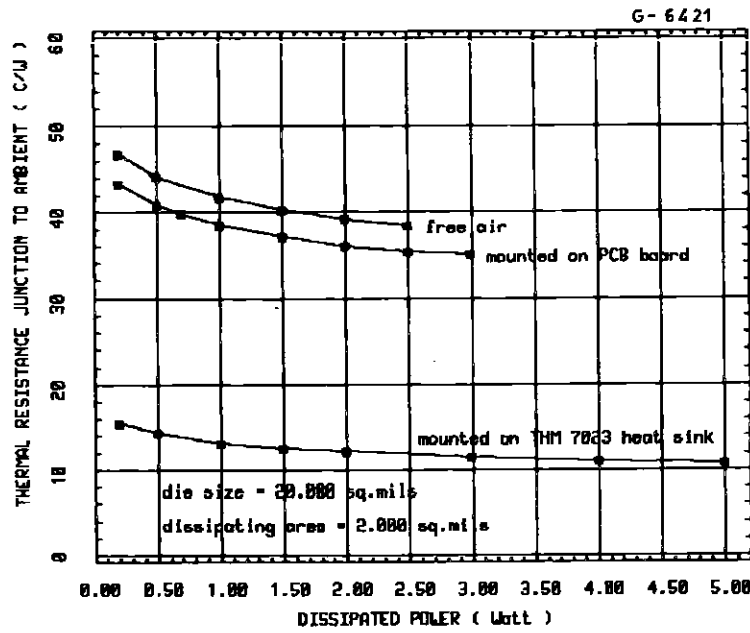


Figure 7 : $R_{th\ j-amb}$ vs. Dissipated Power (Multiwatt).



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

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

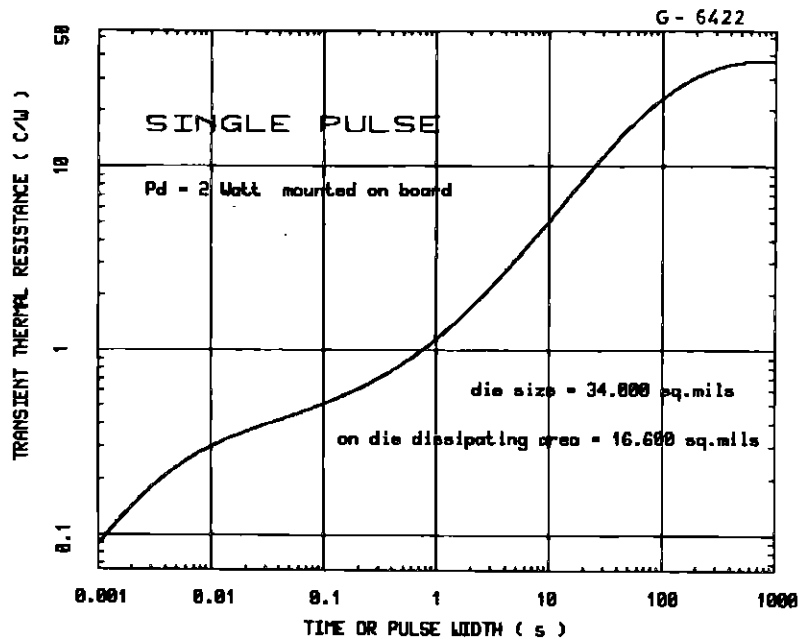
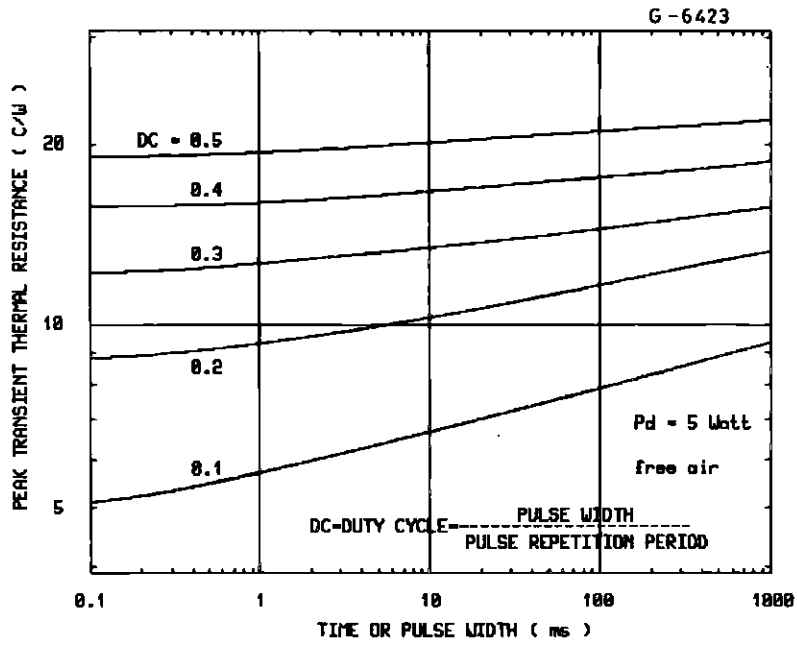
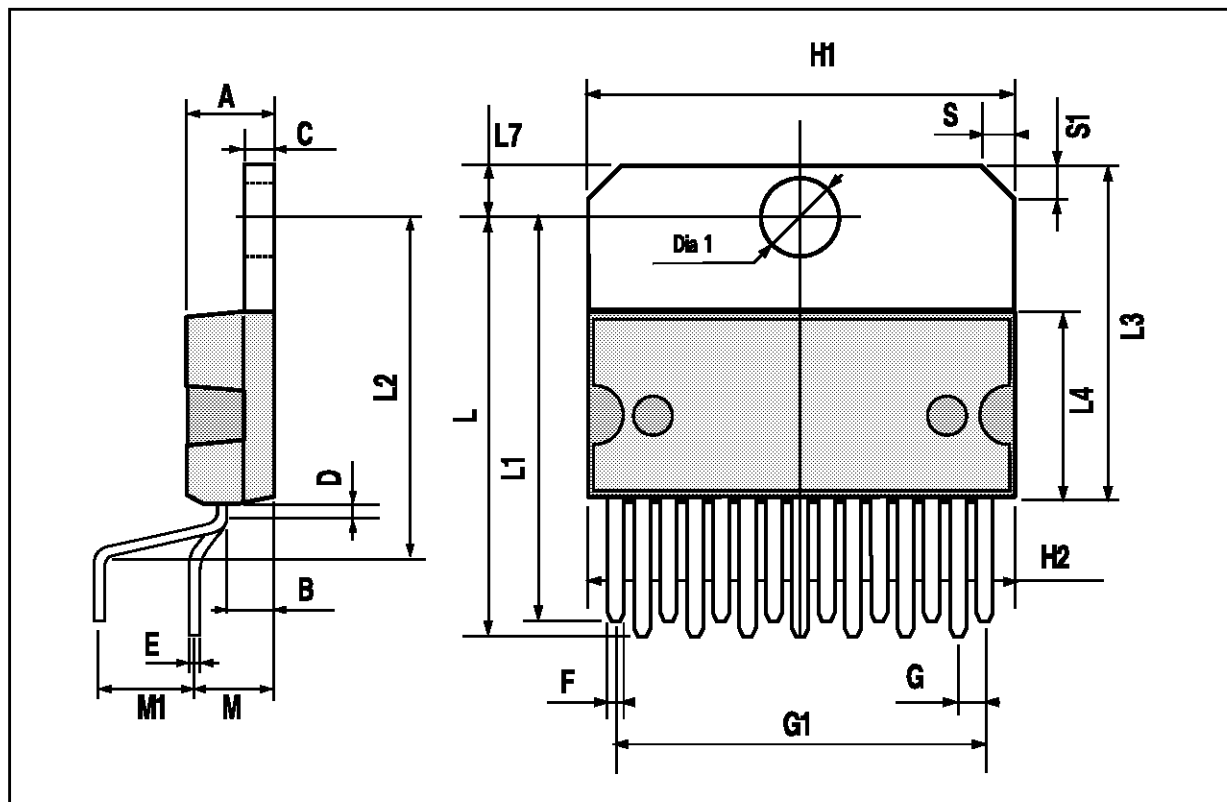


Figure 9 : Peak Transient Thermal Resistance vs. Pulse Width and Duty Cycle (Multiwatt).



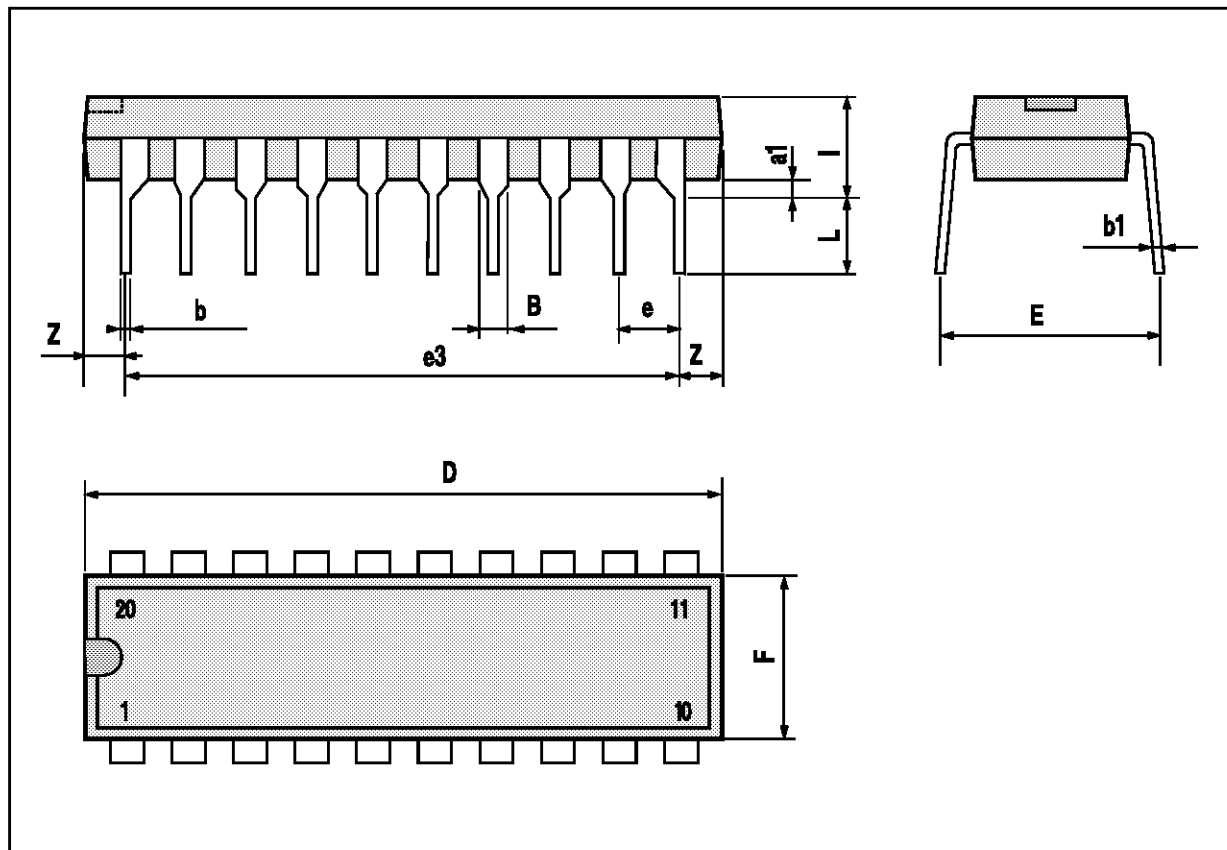
MULTIWATT15 PACKAGE MECHANICAL DATA

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
l			5.10			0.201
L		3.30			0.130	
Z			1.27			0.050



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