LPM9017 - -30V/4A

P-Channel Enhancement Mode Field Effect Transistor

General Description

The LPM9017 is the P-channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application, notebook computer power management and other battery powered circuits where high-side switching.

Features

- -30V/-4A,$R_{DS(ON)}$<58mΩ(typ.)@V_{GS}=-10V
- -30V/-3.0A,$R_{DS(ON)}$<68mΩ(typ.)@V_{GS}=-4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- SOT23 Package

Applications

- ✧ Portable Media Players
- ✧ Cellular and Smart mobile phone
- ✧ LCD
- ✧ DSC Sensor
- ✧ Wireless Card

Ordering Information

LPM9017- □ □ □

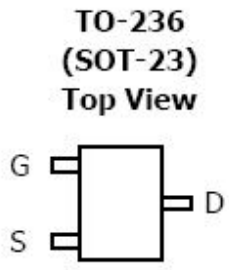
F: Pb-Free

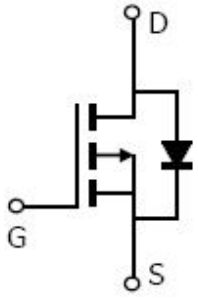
Package Type
B3: SOT23

Marking Information

Please see website.

Pin Configurations





SOT23L(Top View)

Functional Pin Description

Absolute Maximum Ratings T_A=25°C unless otherwise noted				
Parameter		**Symbol**	**Maximum**	**Units**
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	-4.1	A
	T_A=70°C		-3.5	
Pulsed Drain Current [C]		I_{DM}	-25	
Power Dissipation [B]	T_A=25°C	P_D	1.4	W
	T_A=70°C		0.9	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics					
Parameter		**Symbol**	**Typ**	**Max**	**Units**
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	70	90	°C/W
Maximum Junction-to-Ambient [A D]	Steady-State		100	125	°C/W
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	63	80	°C/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-0.6		-1.2	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±12V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-24V,V_{GS}=0V			-1	μA
		V_{DS}=-24V,V_{GS}=0V T_J=55°C			-10	
$R_{DS(ON)}$	Drain-source On-Resistance	V_{GS}=-10V,I_D=-4.0A V_{GS}=-4.5V,I_D=-3.0A V_{GS}=-2.5V,I_D=-2.0A		55 64 85	58 68 95	mΩ
G_{fs}	Forward Transconductance	V_{DS}=-5V,I_D=-4.0A		10		S
Source-Drain Doide						
V_{SD}	Diode Forward Voltage	I_S=-1.0A,V_{GS}=0V		-0.7	-1.0	V
Dynamic Parameters						
Q_g	Total Gate Charge	V_{DS}=-15V V_{GS}=-10V I_D=-4.0A		7		nC
Q_{gs}	Gate-Source Charge			13		
Q_{gd}	Gate-Drain Charge			1.8		
C_{iss}	Input Capacitance	V_{DS}=-15V V_{GS}=0V f=1MHz		680		pF
C_{oss}	Output Capacitance			320		
C_{rss}	Reverse Transfer Capacitance			65		
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V R_L=15Ω I_D=-1A V_{GEN}=-10V R_G=6Ω		12	18	nS
t_r				3	7	
$t_{d(off)}$	Turn-Off Time			34	42	
t_f				3	7	

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

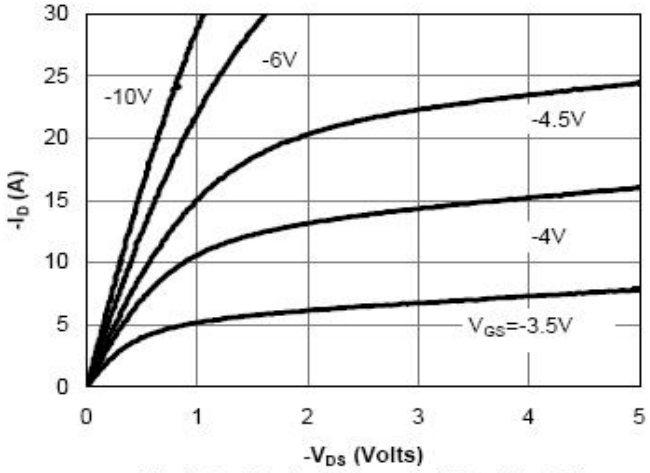


Fig 1: On-Region Characteristics (Note E)

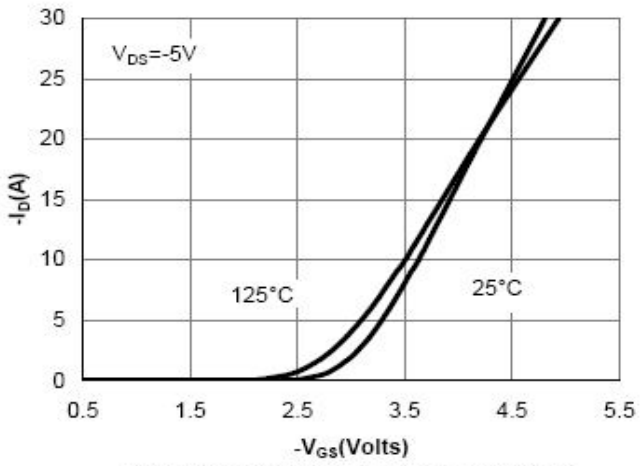


Figure 2: Transfer Characteristics (Note E)

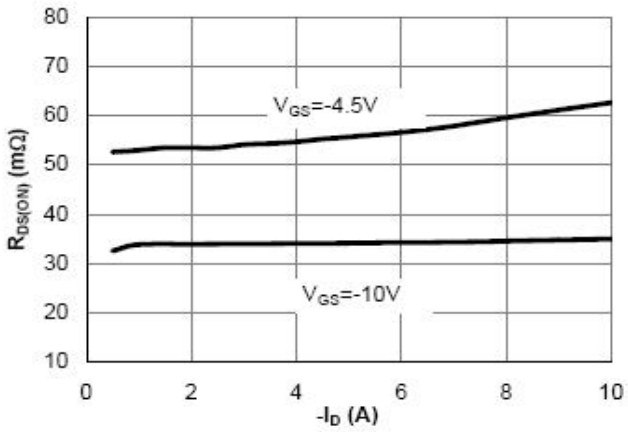


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

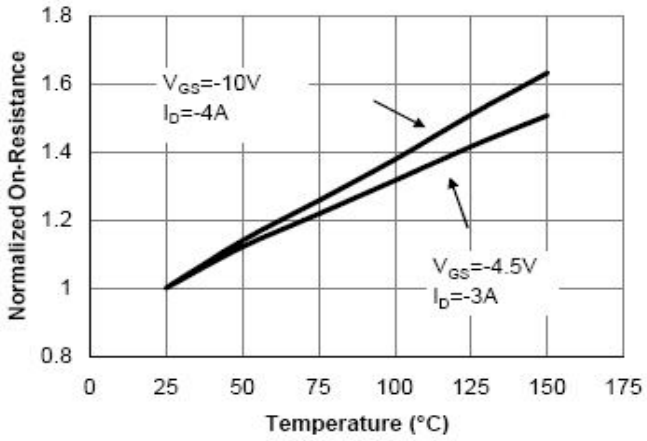


Figure 4: On-Resistance vs. Junction Temperature (Note E)

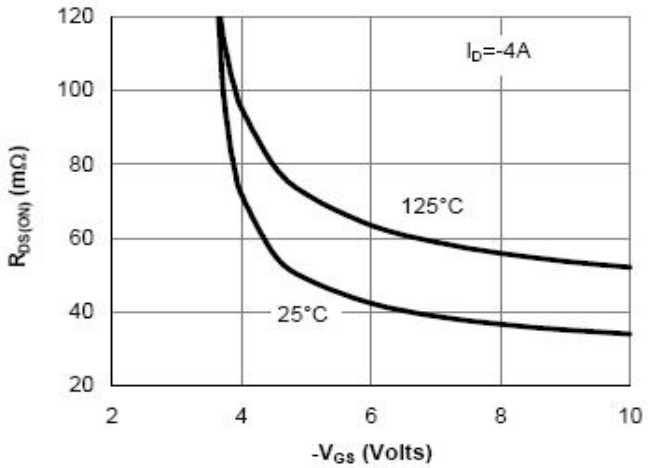


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

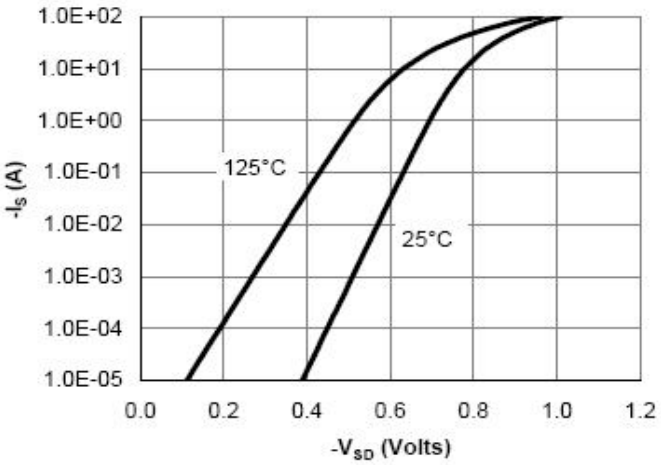


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

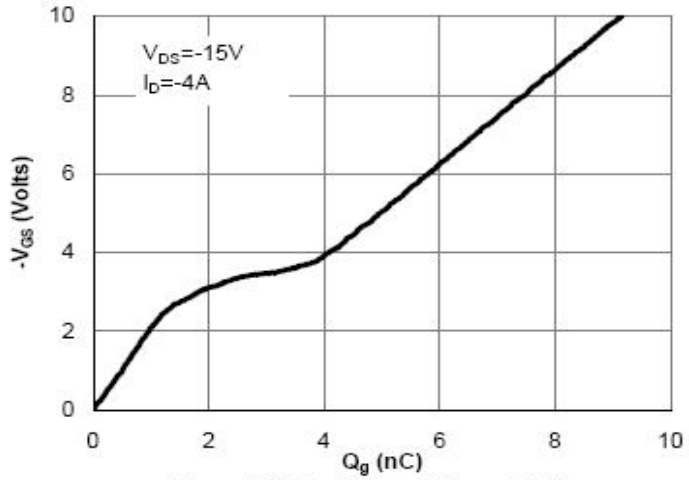


Figure 7: Gate-Charge Characteristics

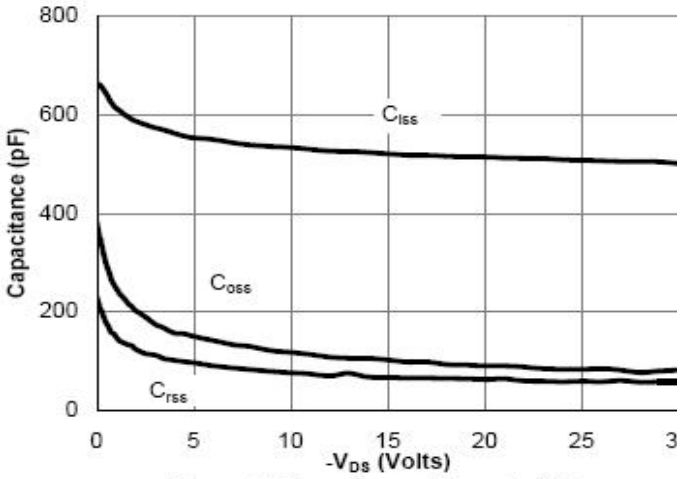


Figure 8: Capacitance Characteristics

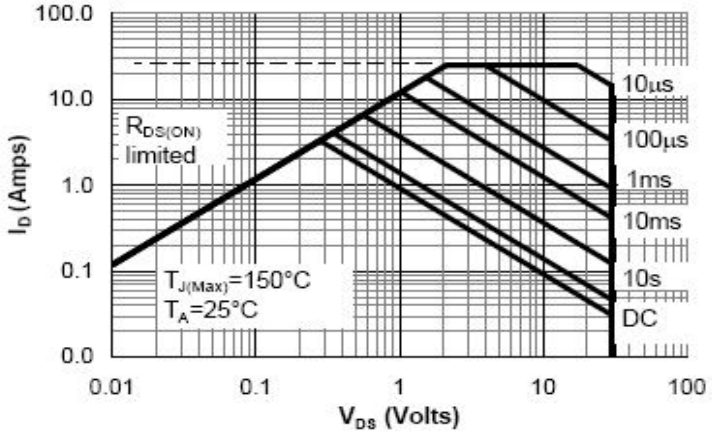


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

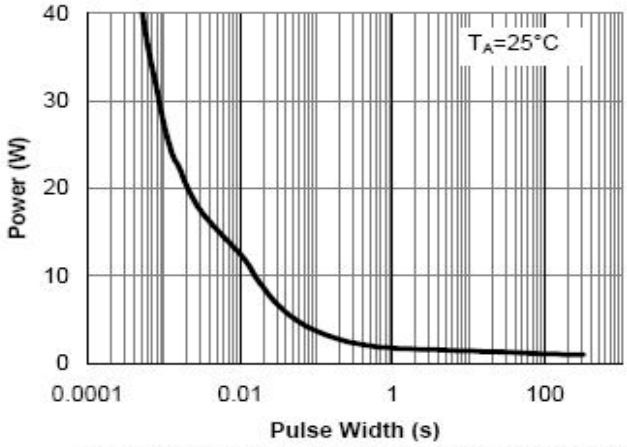


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

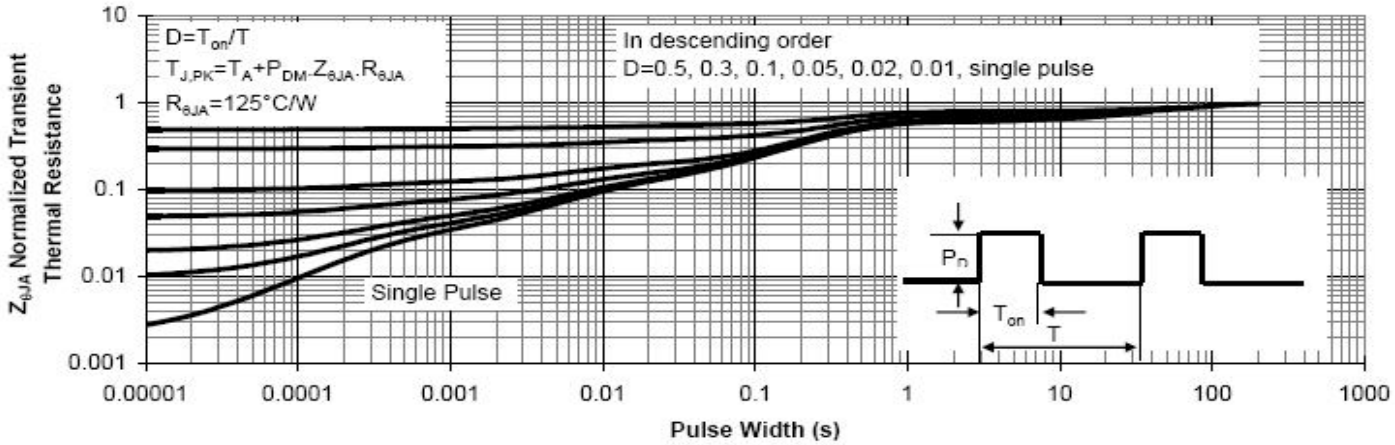
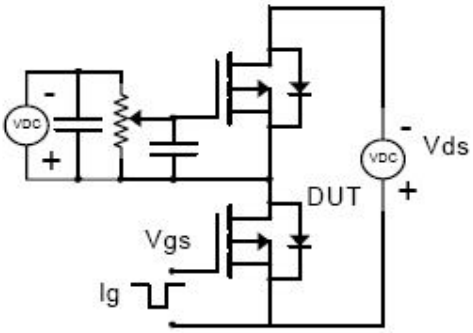
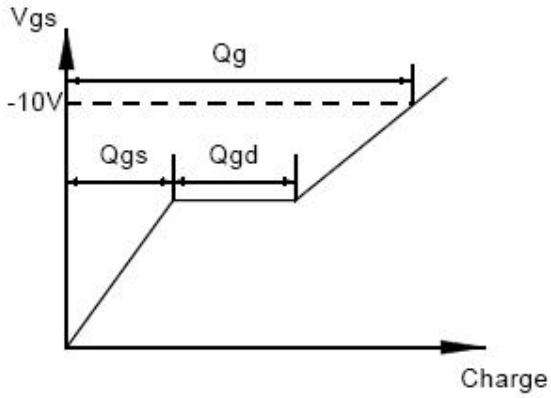


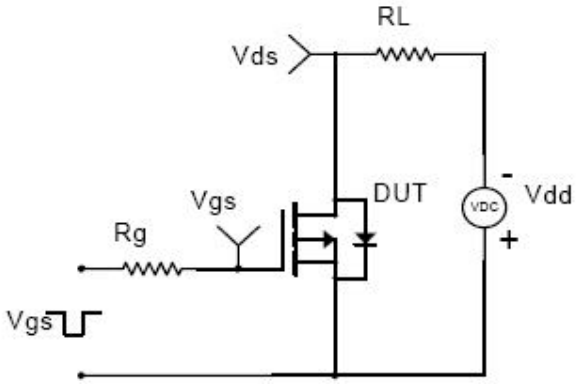
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

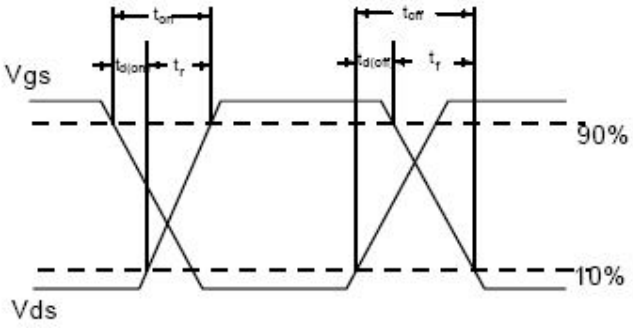
Gate Charge Test Circuit & Waveform



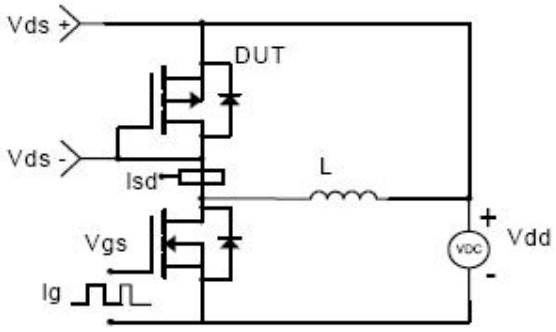


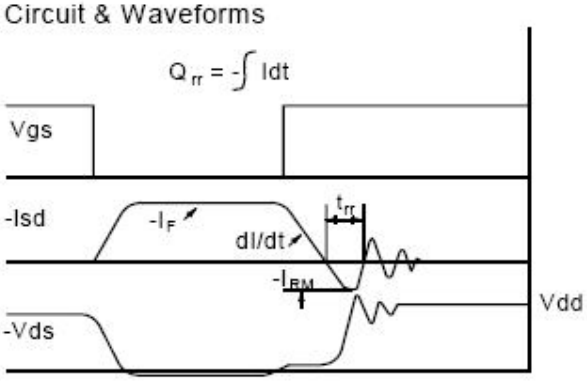
Resistive Switching Test Circuit & Waveforms





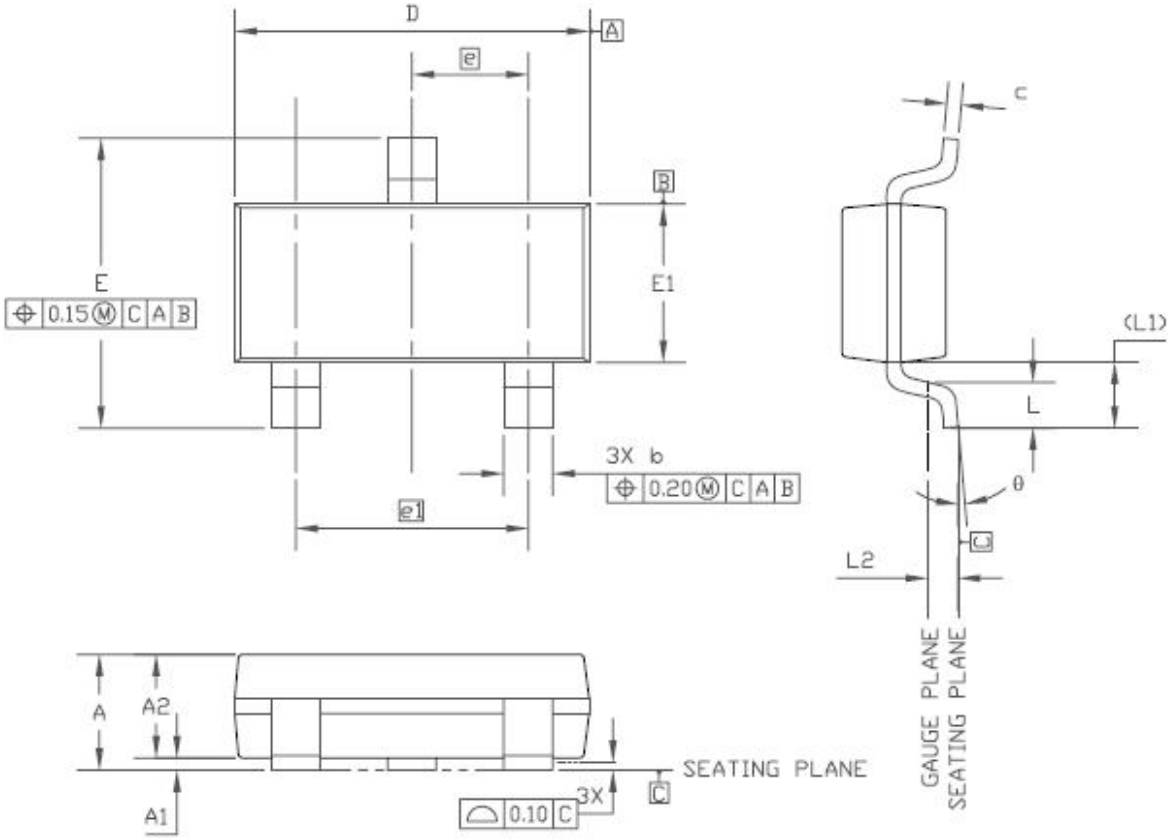
Diode Recovery Test Circuit & Waveforms



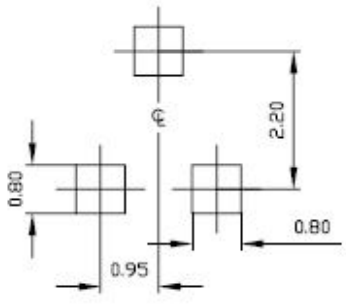


Packaging Information

SOT–23 STANDARD PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.75	—	1.17	0.030	—	0.046
A1	0.05	—	0.15	0.002	—	0.006
A2	0.70	0.85	1.02	0.028	0.033	0.040
b	0.30	—	0.50	0.012	—	0.020
c	0.08	—	0.20	0.003	—	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	2.10	—	2.64	0.083	—	0.104
E1	1.20	1.30	1.40	0.047	0.051	0.055
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
L	0.40	0.50	0.60	0.016	0.020	0.024
L1	0.54 REF			0.021REF		
L2	0.25			0.010		
θ1	0°	—	8°	0°	—	8°