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/-4.0A,$R_{DS(ON)}$ < 58mΩ(typ.)@VGS=-10V
- -30V/-3.0A,$R_{DS(ON)}$ < 68mΩ(typ.)@VGS=-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

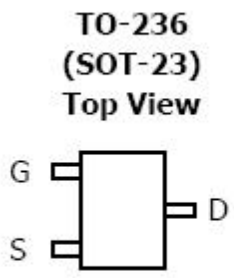
Package Type

B3: SOT23

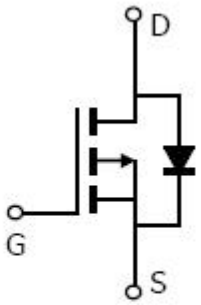
Marking Information

Device	Marking	Package	Shipping
LPM9017	A1XX	SOT23	3K/REEL

Pin Configurations



SOT23L(Top View)



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}	±12	V
Continuous Drain Current A	T_A=25°C	I_D	-4	A
	T_A=70°C		-3.5	
Pulsed Drain Current B		I_{DM}	-25	
Power Dissipation A	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	Steady-State		100	125	°C/W
Maximum Junction-to-Lead C	Steady-State	$R_{\theta JL}$	63	80	°C/W

Functional Pin Description

Symbol	Parameter	Condition	Min	Typ.	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=-250μA, V_{GS}=0V	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-24V, V_{GS}=0V			-1	uA
		T_J=55°C			-10	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±12V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=-250μA	-0.6		-1.2	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-4A		55	58	mΩ
		V_{GS}=-4.5V, I_D=-3A		64	68	
		V_{GS}=-2.5V, I_D=-2A		85	95	mΩ
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-4A		10		S
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V		-0.7	-1	V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, f=1MHz		680		pF
C_{oss}	Output Capacitance			320		pF
C_{rss}	Reverse Transfer Capacitance			65		pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-15V, I_D=-4A		7		nC
Q_{gs}	Gate Source Charge			13		nC
Q_{gd}	Gate Drain Charge			1.8		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω, R_{GEN}=6Ω		12	18	nS
t_r	Turn-On Rise Time			3	7	
$t_{D(off)}$	Turn-Off DelayTime			34	42	
t_f	Turn-Off Fall Time			3	7	

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

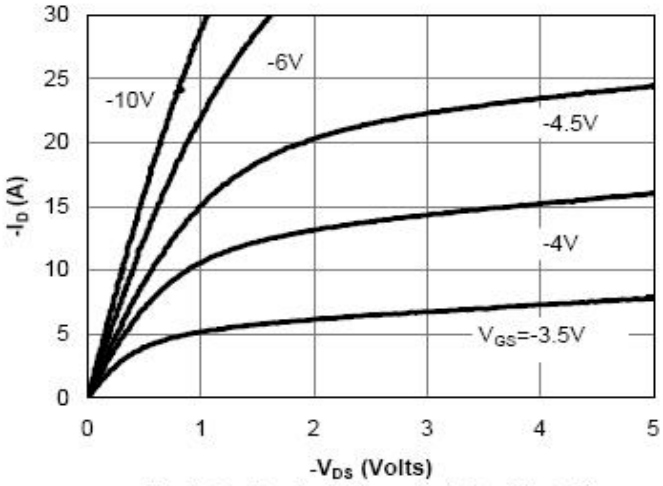


Fig 1: On-Region Characteristics (Note E)

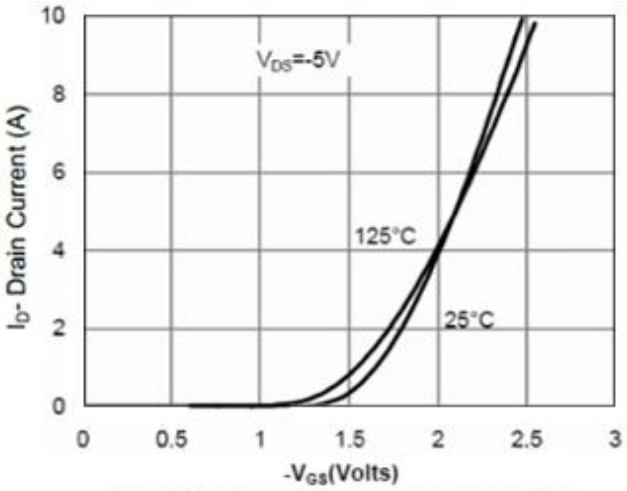


Figure 2: Transfer Characteristics (Note E)

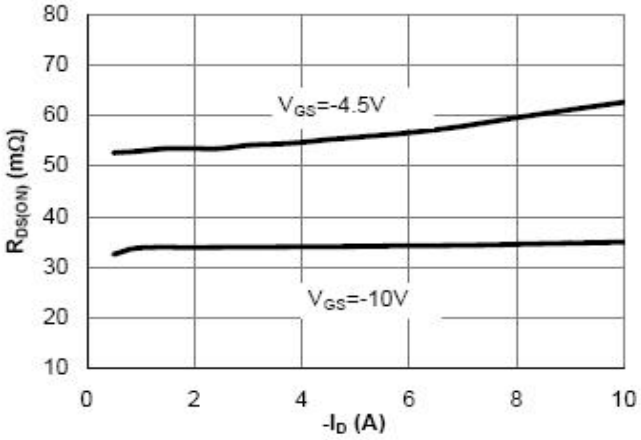


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

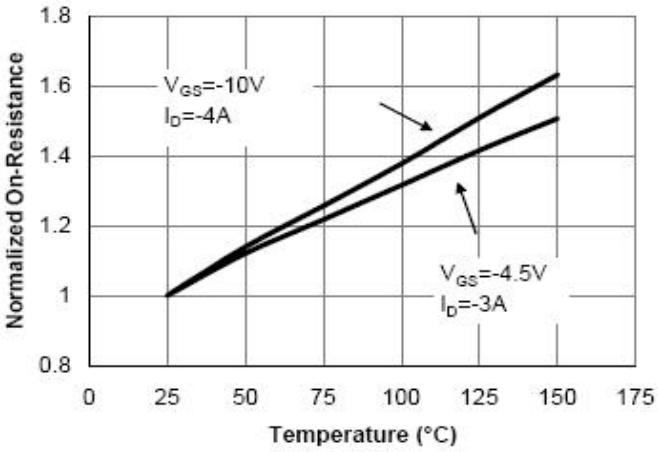


Figure 4: On-Resistance vs. Junction Temperature (Note E)

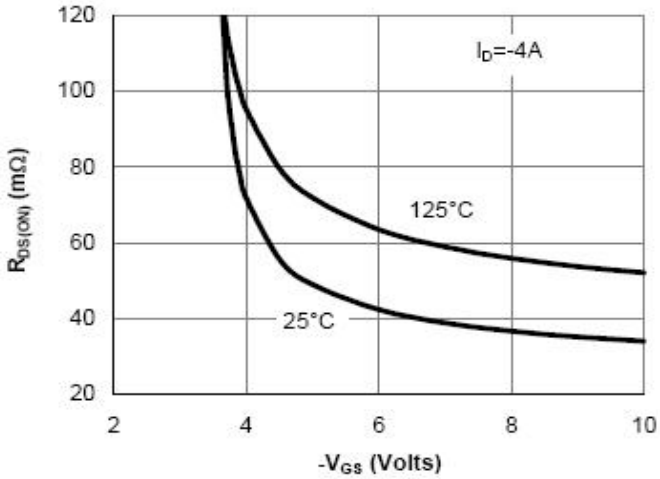


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

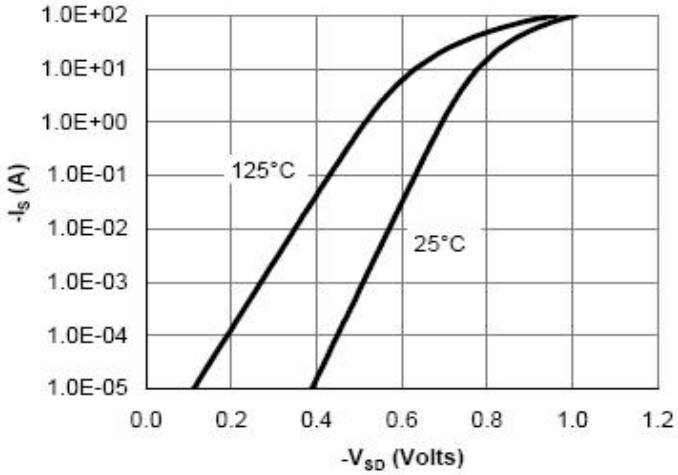


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

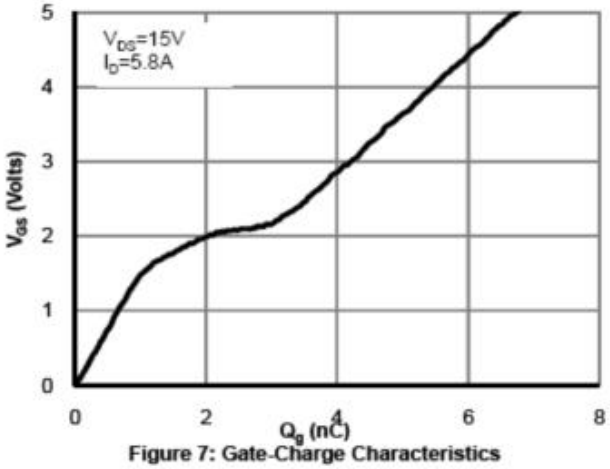


Figure 7: Gate-Charge Characteristics

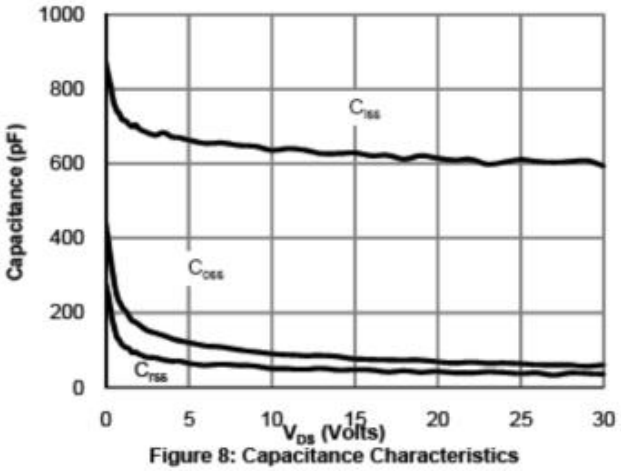


Figure 8: Capacitance Characteristics

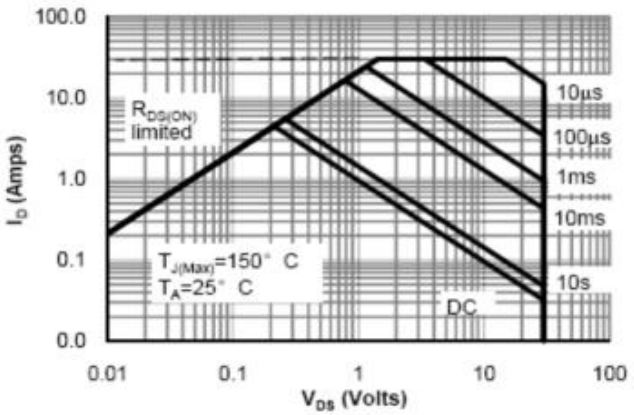


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

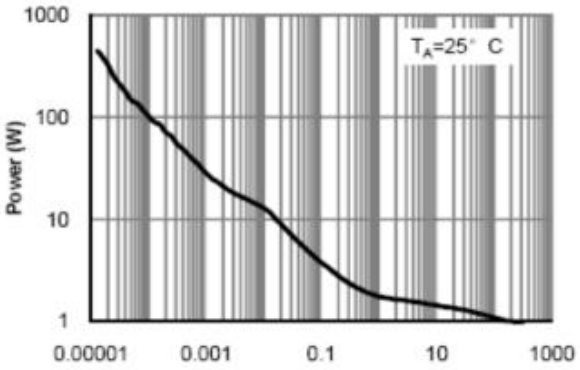


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

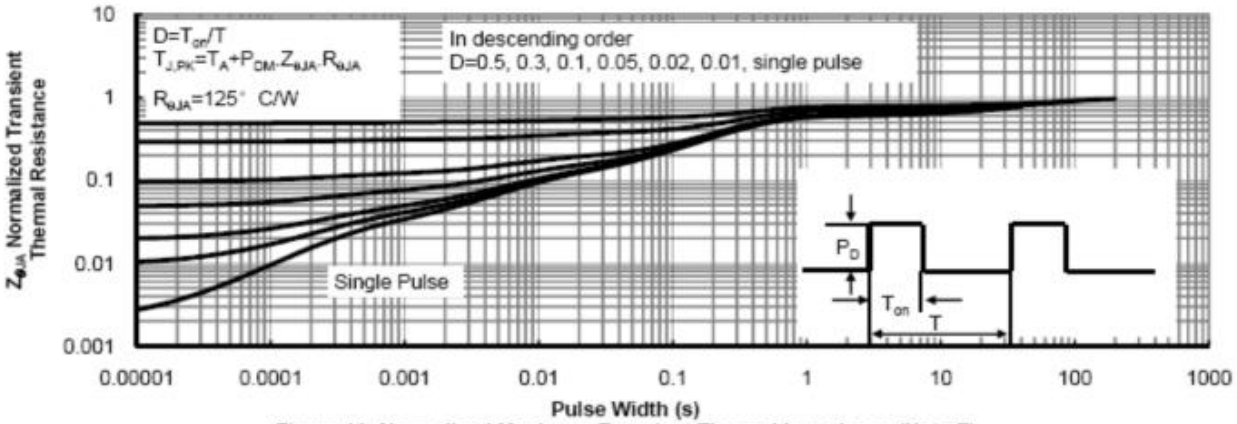
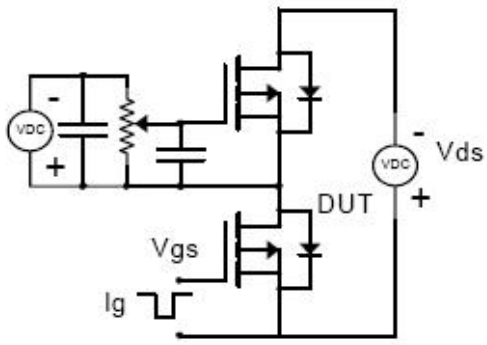
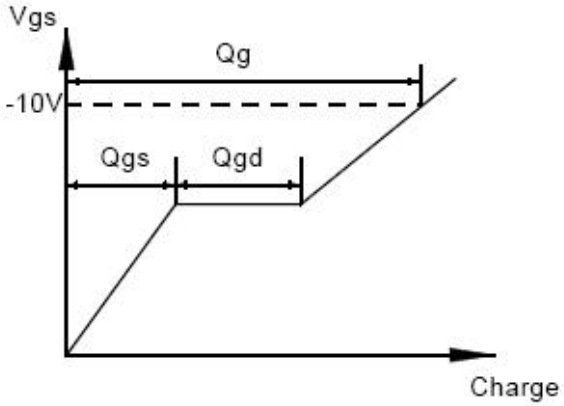


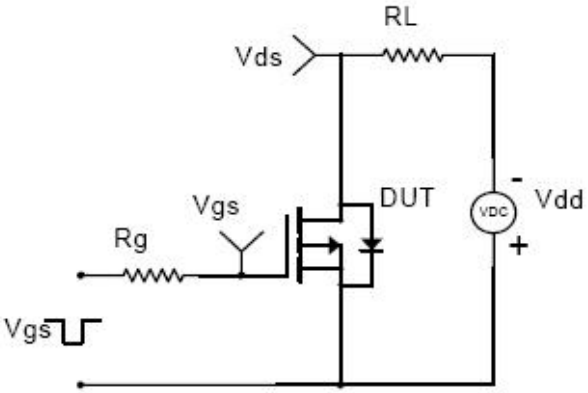
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

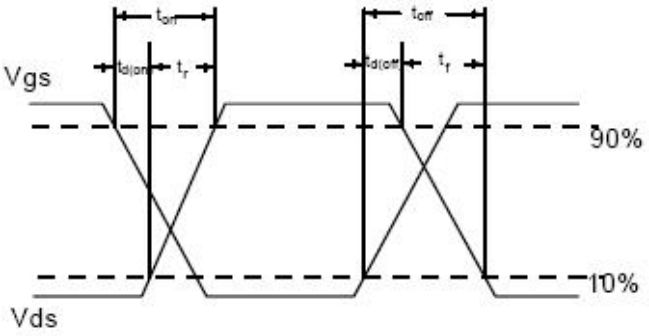
Gate Charge Test Circuit & Waveform



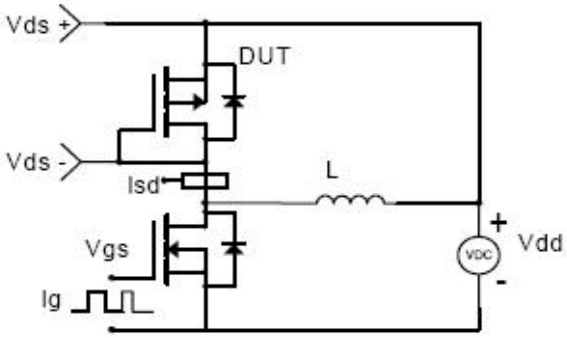


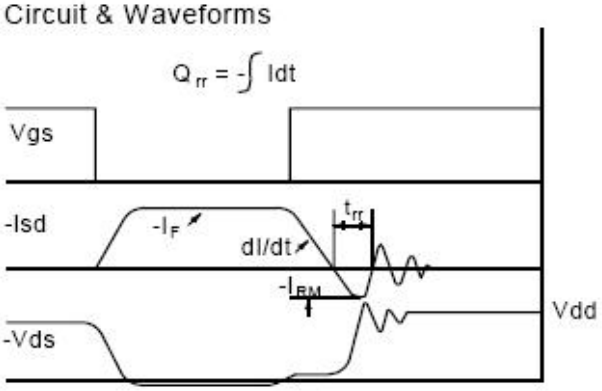
Resistive Switching Test Circuit & Waveforms





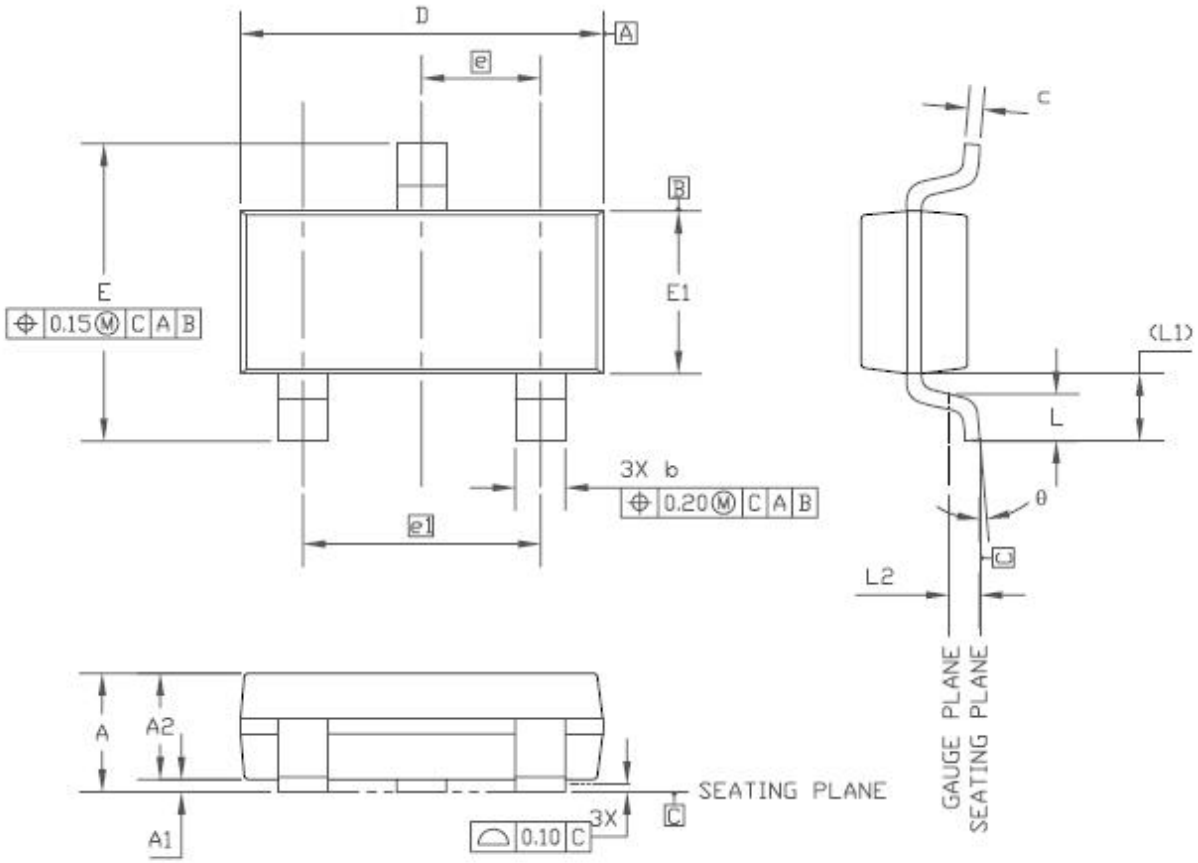
Diode Recovery Test Circuit & Waveforms



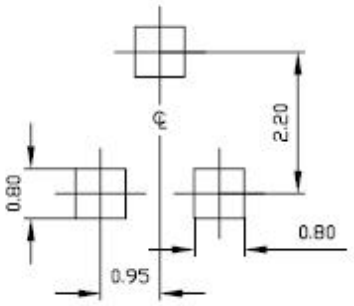


Packaging Information

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°