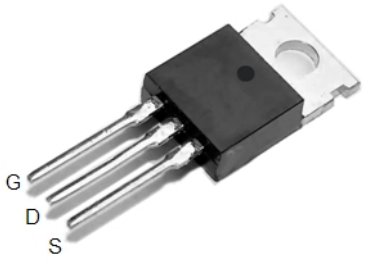
RU30290R

N-Channel Advanced Power MOSFET

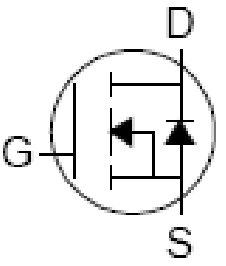
Features

- 30V/290A,
  $R_{DS(ON)}$ =1.8mΩ(Typ.)@V_{GS}=10V
- Super High Dense Cell Design
- Ultra Low On-Resistance
- 100% avalanche tested
- Lead Free and Green Devices Available
  (RoHS Compliant)

Pin Description



TO-220



N-Channel MOSFET

Applications

- DC-DC Converters and Off-line UPS
- Switching Applications

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C=25°C	290①	A
Mounted on Large Heat Sink				
I_{DP}	300μs Pulse Drain Current Tested	T_C=25°C	1160②	A
I_D	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	290①	A
		T_C=100°C	194①	
P_D	Maximum Power Dissipation	T_C=25°C	375	W
		T_C=100°C	188	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.4	°C/W
Drain-Source Avalanche Ratings				
E_{AS}③	Avalanche Energy, Single Pulsed		306	mJ

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Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

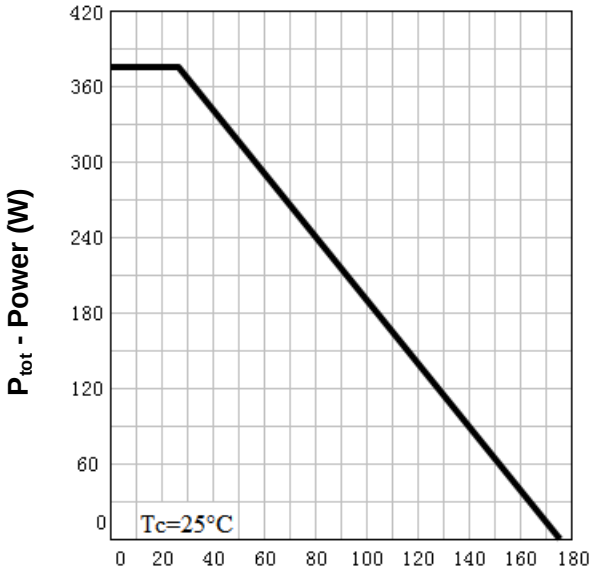
Symbol	Parameter	Test Condition	RU30290R			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
		T_J=85°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	2		4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ④	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=75A		1.8	2.5	mΩ
Diode Characteristics						
V_{SD} ④	Diode Forward Voltage	I_{SD}=75A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=75A, dI_{SD}/dt=100A/μs		56		ns
Q_{rr}	Reverse Recovery Charge			102		nC
Dynamic Characteristics ⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.5		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz		4950		pF
C_{oss}	Output Capacitance			1010		
C_{rss}	Reverse Transfer Capacitance			210		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=0.2Ω I_{DS}=75A, V_{GEN}=10V, R_G=2.5Ω		21		ns
t_r	Turn-on Rise Time			99		
$t_{d(OFF)}$	Turn-off Delay Time			105		
t_f	Turn-off Fall Time			52		
Gate Charge Characteristics ⑤						
Q_g	Total Gate Charge	V_{DS}=24V, V_{GS}=10V, I_{DS}=75A		95		nC
Q_{gs}	Gate-Source Charge			27		
Q_{gd}	Gate-Drain Charge			32		

Notes: ①Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.
②Pulse width limited by safe operating area.
③Limited by T_{Jmax}, I_{AS} =35A, V_{DD} = 24V, R_G = 50Ω , Starting T_J = 25°C.
④Pulse test ; Pulse width≤300μs, duty cycle≤2%.
⑤Guaranteed by design, not subject to production testing.

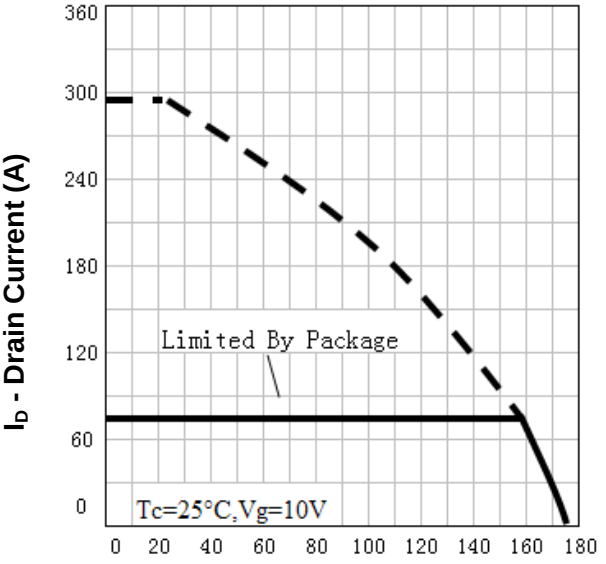
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Typical Characteristics

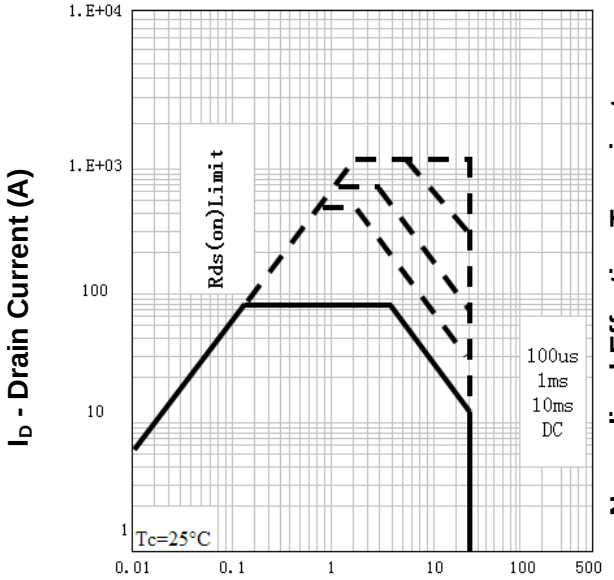
Power Dissipation



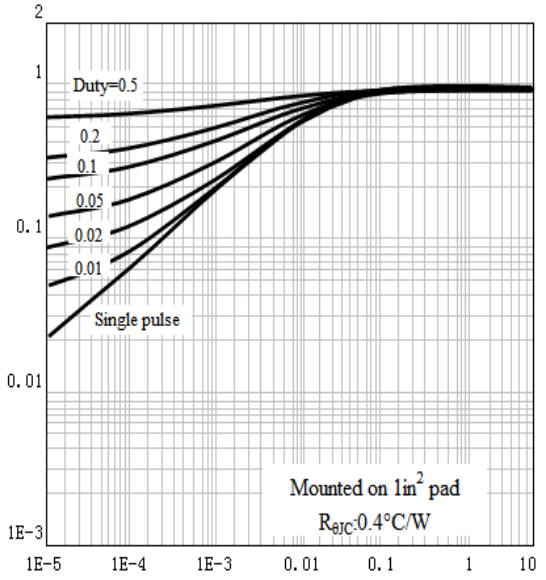
Drain Current



Safe Operation Area

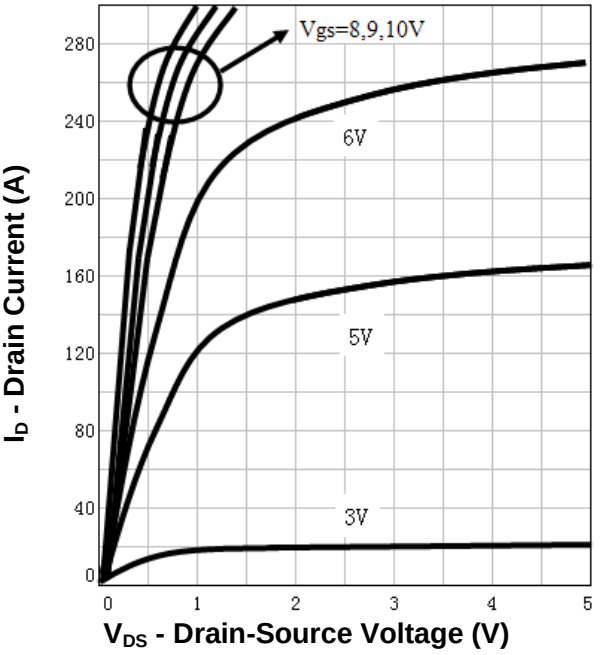


Thermal Transient Impedance

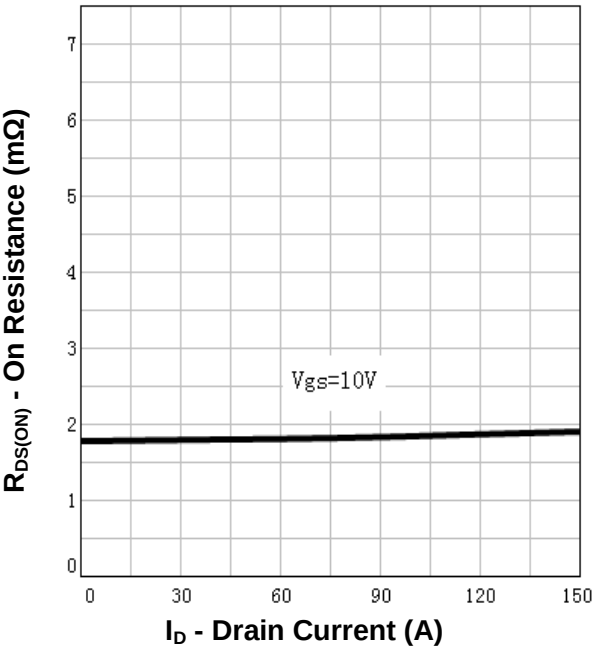


Typical Characteristics

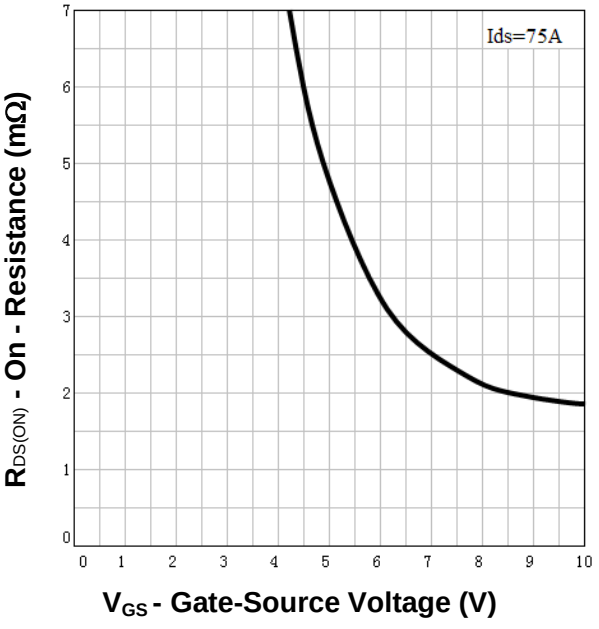
Output Characteristics



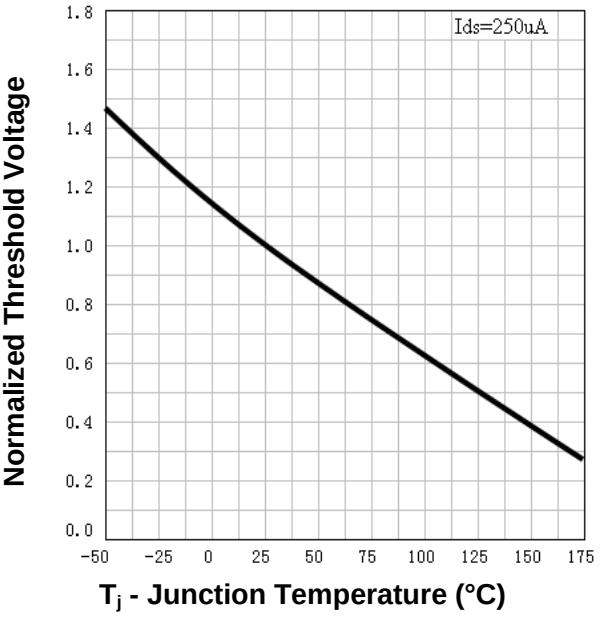
Drain-Source On Resistance



Drain-Source On Resistance

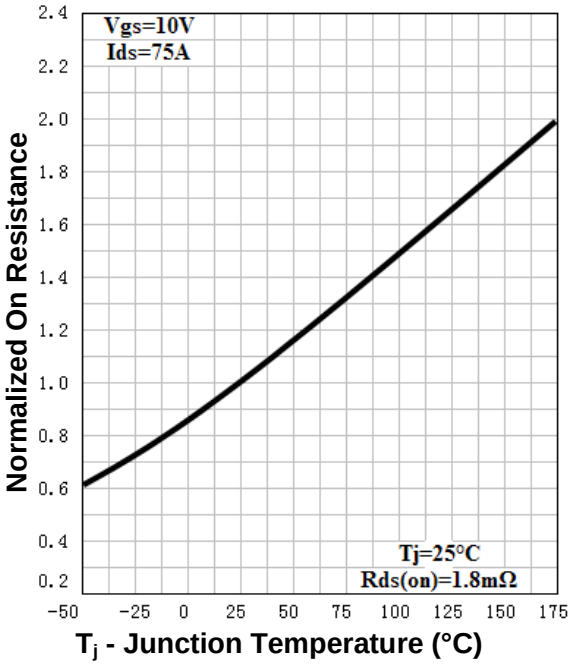


Gate Threshold Voltage

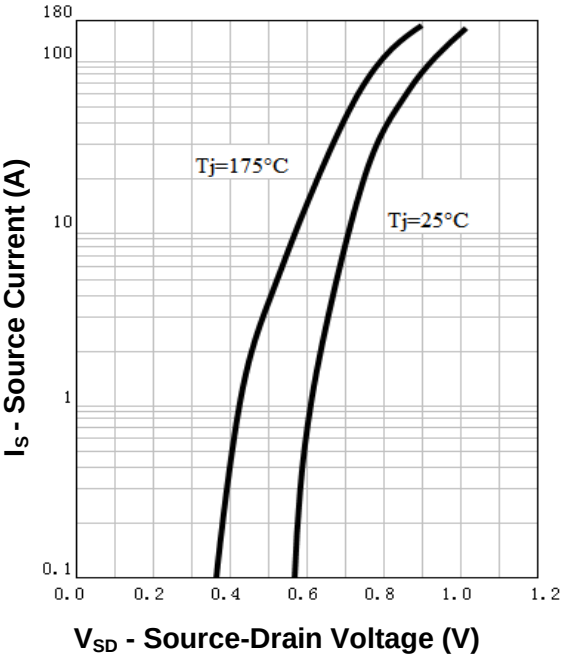


Typical Characteristics

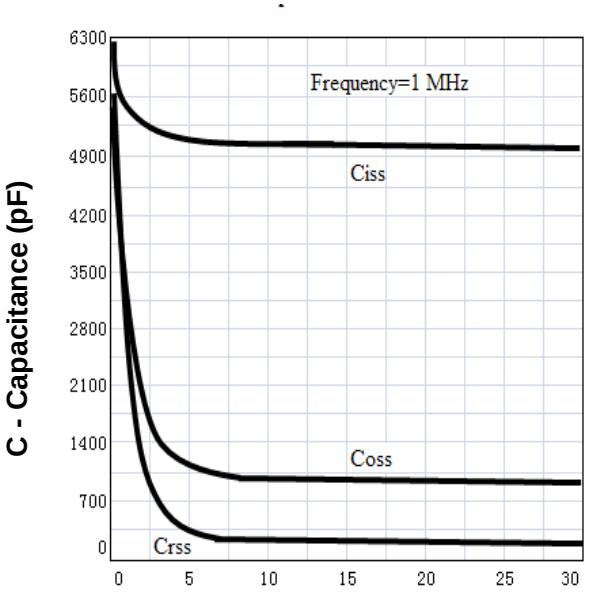
Drain-Source On Resistance



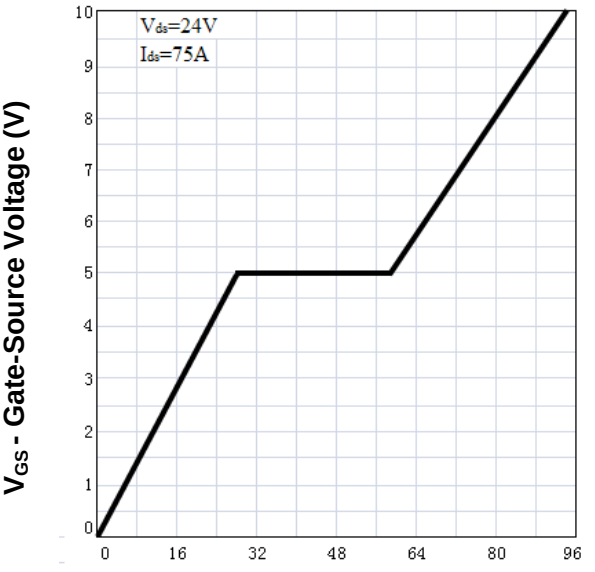
Source-Drain Diode Forward



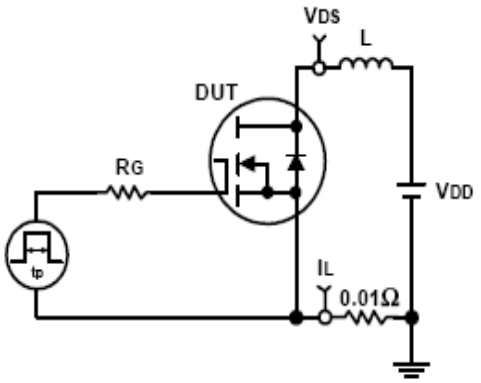
Capacitance

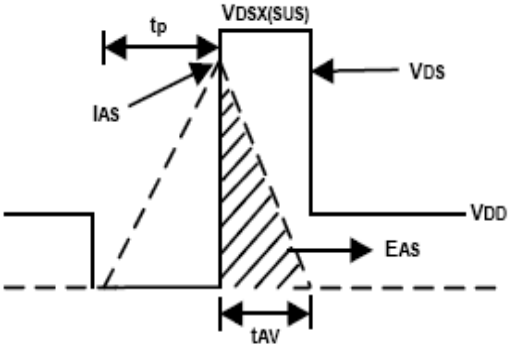


Gate Charge

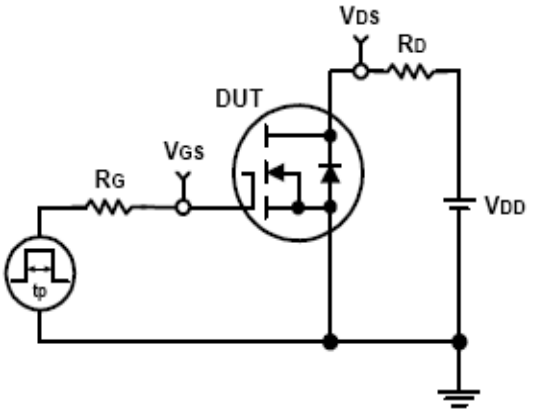


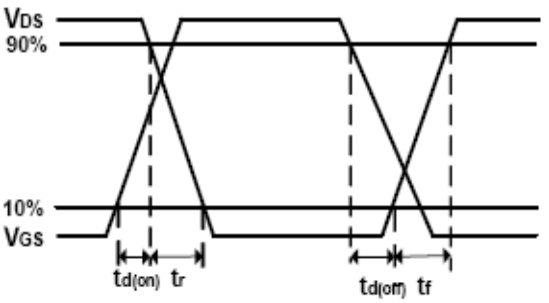
Avalanche Test Circuit and Waveforms





Switching Time Test Circuit and Waveforms



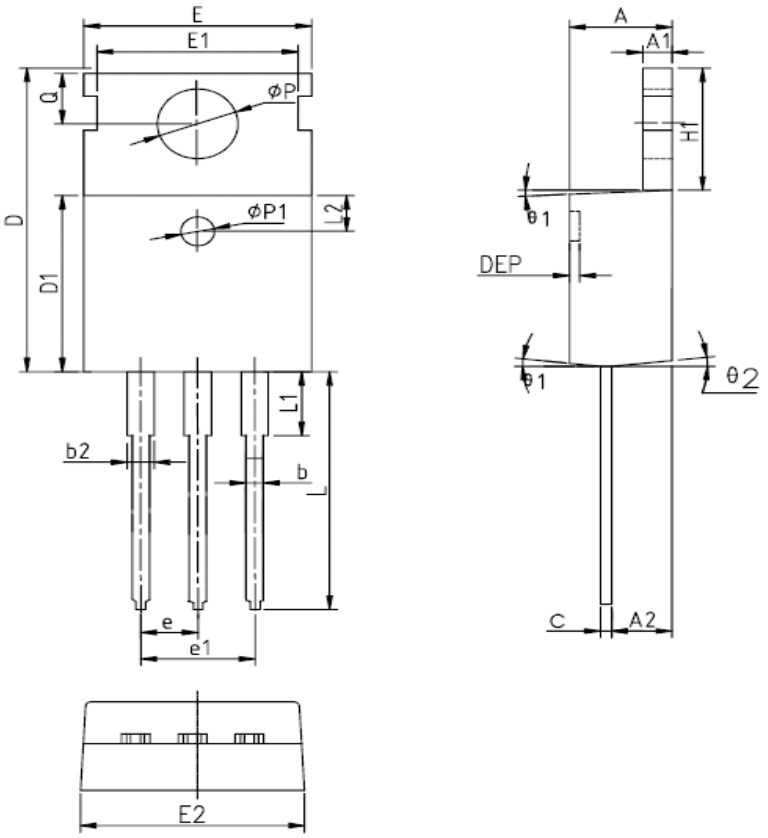


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU30290R	RU30290R	TO-220	Tube	50	-	-

Package Information

TO-220FB-3L



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185	Øp1	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.27	1.30	1.33	0.050	0.051	0.052	e	2.54BSC			0.1BSC		
A2	2.35	2.40	2.50	0.093	0.094	0.098	e1	5.08BSC			0.2BSC		
b	0.77	-	0.90	0.030	-	0.035	H1	6.40	6.50	6.60	0.252	0.256	0.260
b2	1.23	-	1.36	0.048	-	0.054	L	12.75	-	13.17	0.502	-	0.519
C	0.48	0.50	0.52	0.019	0.020	0.021	L1	-	-	3.95	-	-	0.156
D	15.40	15.60	15.80	0.606	0.614	0.622	L2	2.50REF.			0.098REF.		
D1	9.00	9.10	9.20	0.354	0.358	0.362	Øp	3.57	3.60	3.63	0.141	0.142	0.143
DEP	0.05	0.10	0.20	0.002	0.004	0.008	Q	2.73	2.80	2.87	0.107	0.110	0.113
E	9.70	9.90	10.10	0.382	0.389	0.398	θ 1	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	θ 2	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							

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