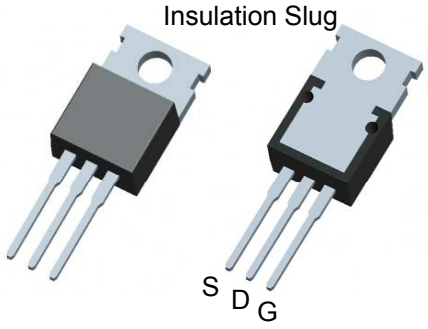
Features

- 80V/80A,
  $R_{DS\ (ON)}$ =7mΩ(Typ.)@V_{GS}=10V
- Insulation Slug(V_{ISO}≥1500VAC)
- Ultra Low On-Resistance
- Exceptional dv/dt capability
- Fast Switching and Fully Avalanche Rated
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Switching Application Systems
- Inverter Systems

Pin Description



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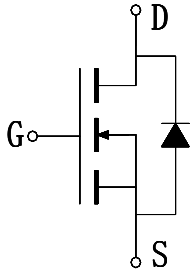


N-Channel MOSFET

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		80	V
V_{GSS}	Gate-Source Voltage		±25	
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	80	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	320	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	80	A
		T_C=100°C	56	
P_D	Maximum Power Dissipation	T_C=25°C	150	W
		T_C=100°C	75	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.0	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
E_{AS} ③	Avalanche Energy, Single Pulsed		225	mJ

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

Symbol	Parameter	Test Condition	RU7588R3			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	80			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	2	3	4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±25V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$④	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=40A		7	9	mΩ
Diode Characteristics						
V_{SD}④	Diode Forward Voltage	I_{SD}=40A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=40A, dI_{SD}/dt=100A/μs		48		ns
Q_{rr}	Reverse Recovery Charge			105		nC
Dynamic Characteristics⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.4		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, Frequency=1.0MHz		3400		pF
C_{oss}	Output Capacitance			450		
C_{rss}	Reverse Transfer Capacitance			170		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=30V,I_{DS}=40A, V_{GEN}=10V,R_G=7Ω		14		ns
t_r	Turn-on Rise Time			16		
$t_{d(OFF)}$	Turn-off Delay Time			31		
t_f	Turn-off Fall Time			54		
Gate Charge Characteristics⑤						
Q_g	Total Gate Charge	V_{DS}=60V, V_{GS}=10V, I_{DS}=40A		64		nC
Q_{gs}	Gate-Source Charge			13		
Q_{gd}	Gate-Drain Charge			22		

Notes:

①Pulse width limited by safe operating area.

②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.

③Limited by T_{Jmax}, I_{AS} =30A, V_{DD} = 48V, R_G = 50Ω , Starting T_J = 25°C.

④Pulse test;Pulse width≤300μs, duty cycle≤2%.

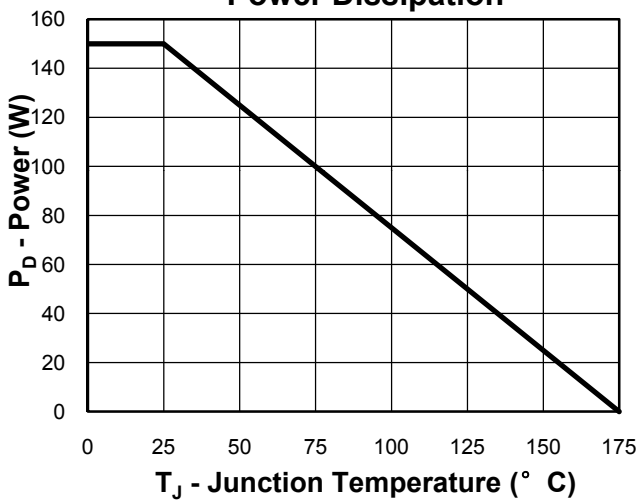
⑤Guaranteed by design, not subject to production testing.

Ordering and Marking Information

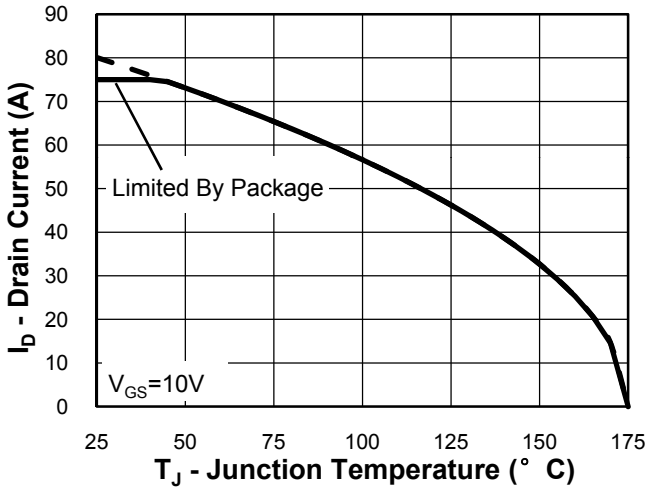
Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU7588R3	RU7588R3	TO220S	Tube	50	-	-

Typical Characteristics

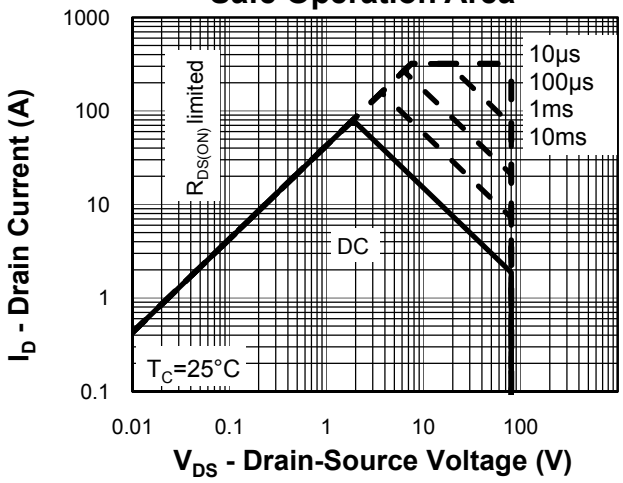
Power Dissipation



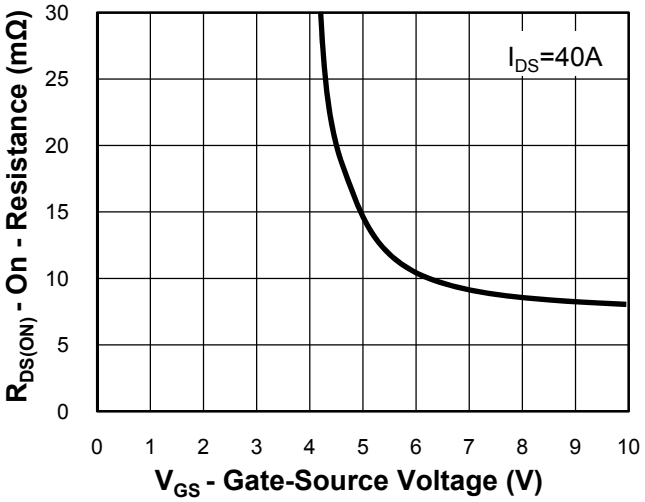
Drain Current



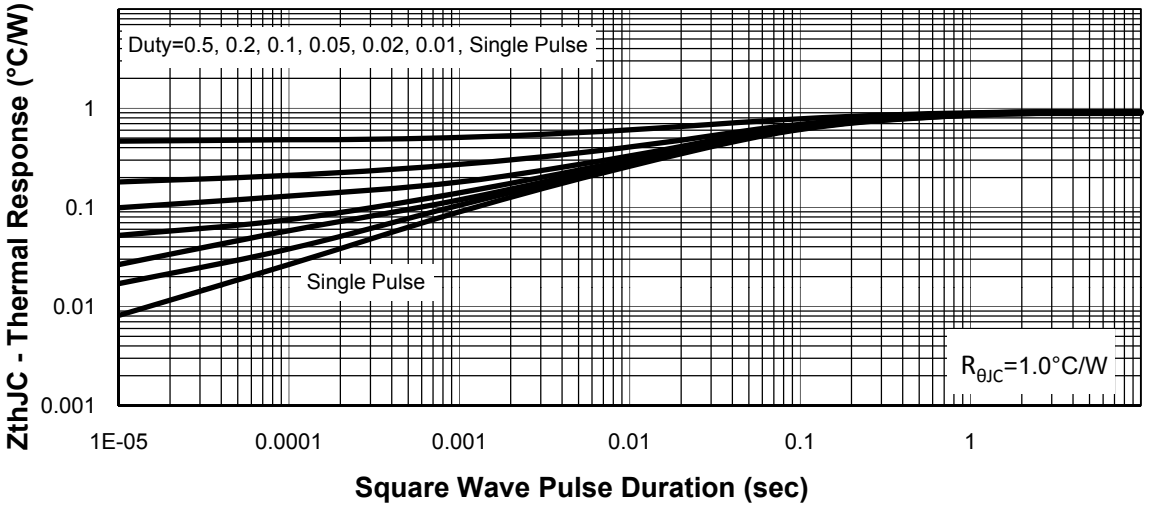
Safe Operation Area



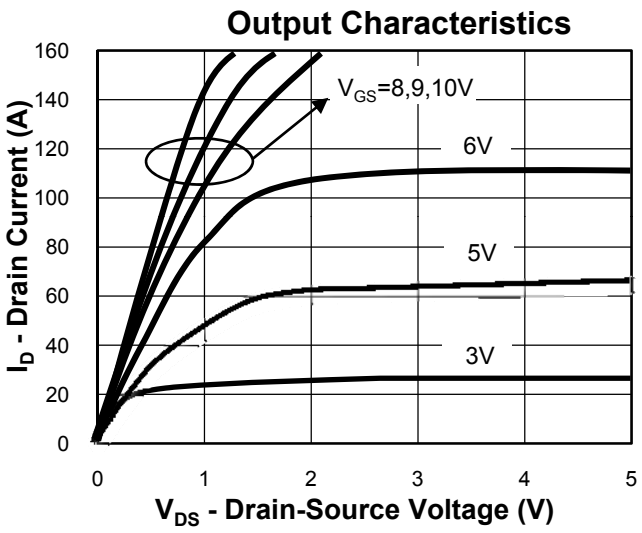
Drain Current

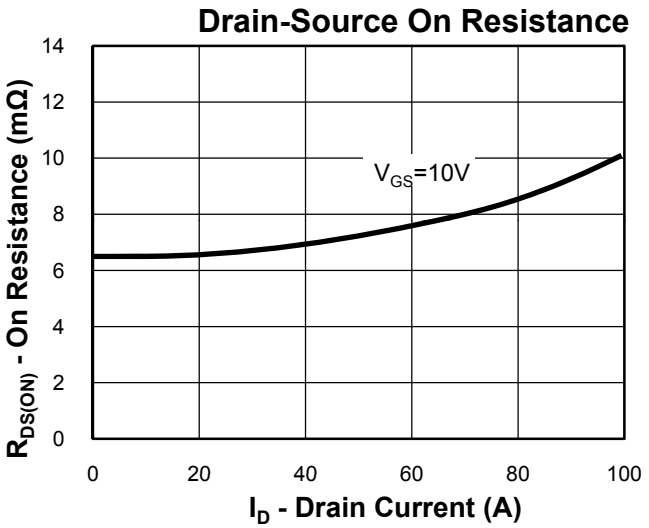


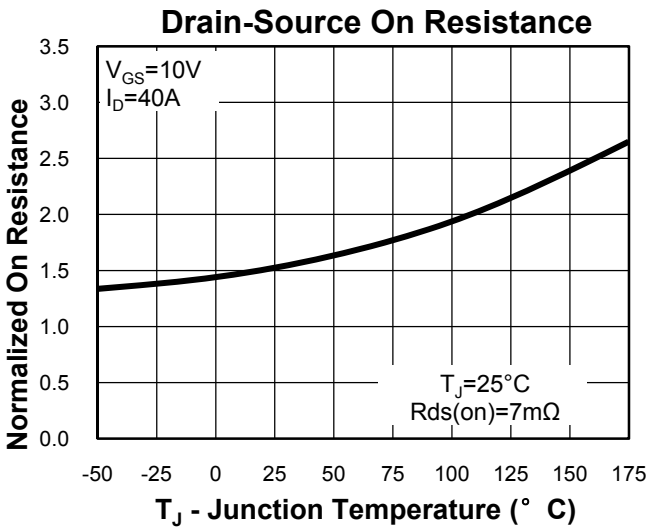
Thermal Transient Impedance

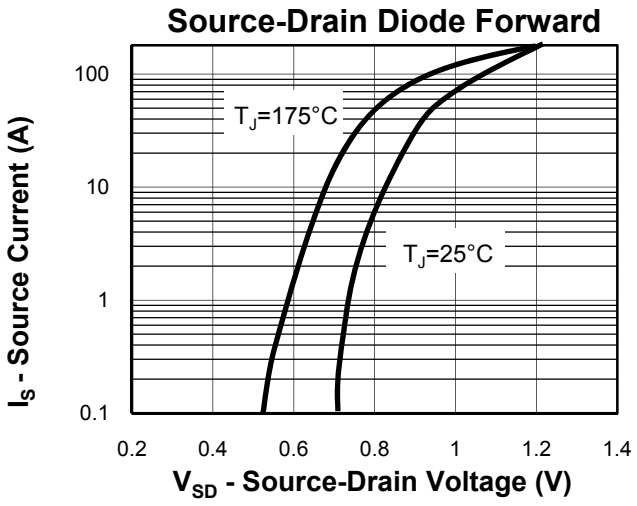


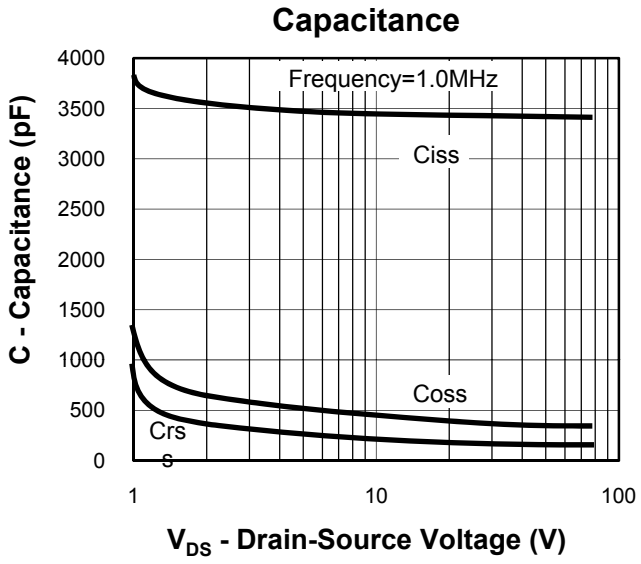
Typical Characteristics

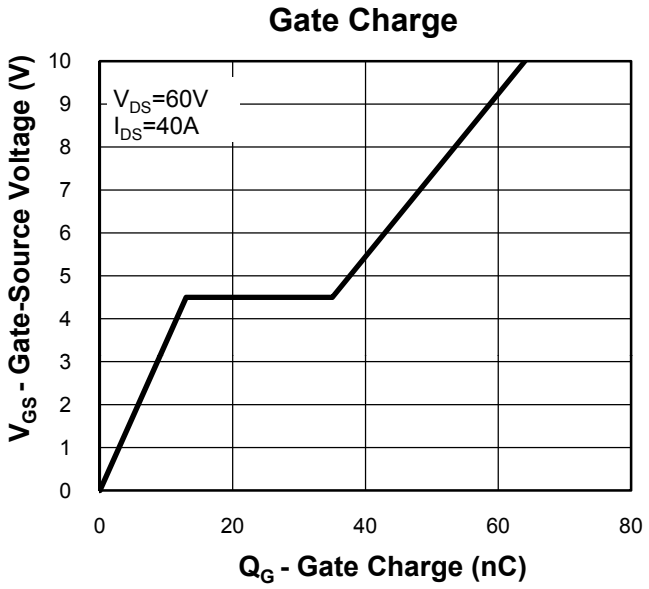




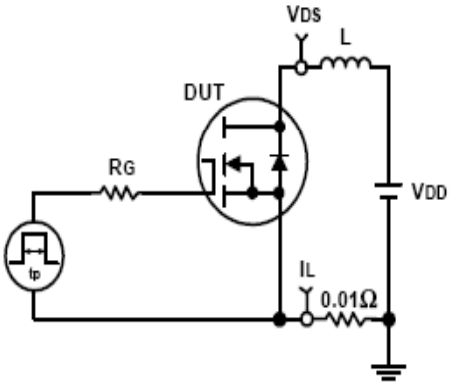


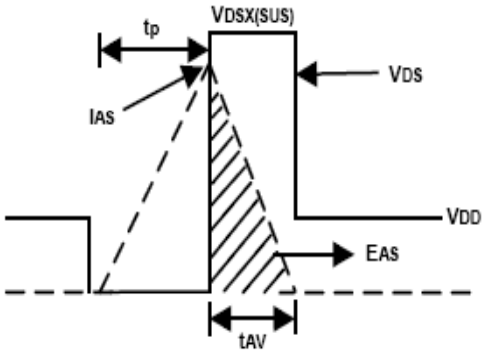




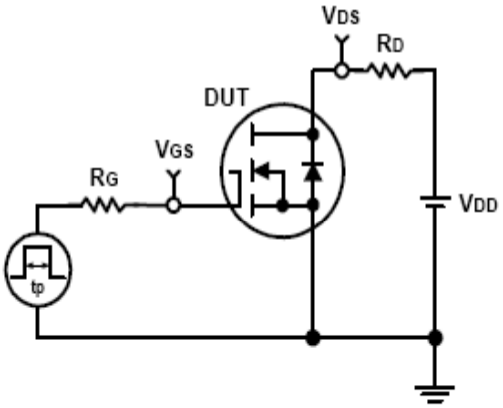


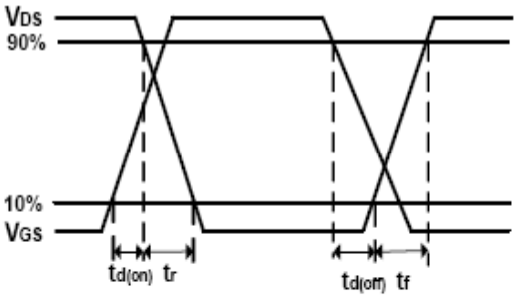
Avalanche Test Circuit and Waveforms





Switching Time Test Circuit and Waveforms





Package Information

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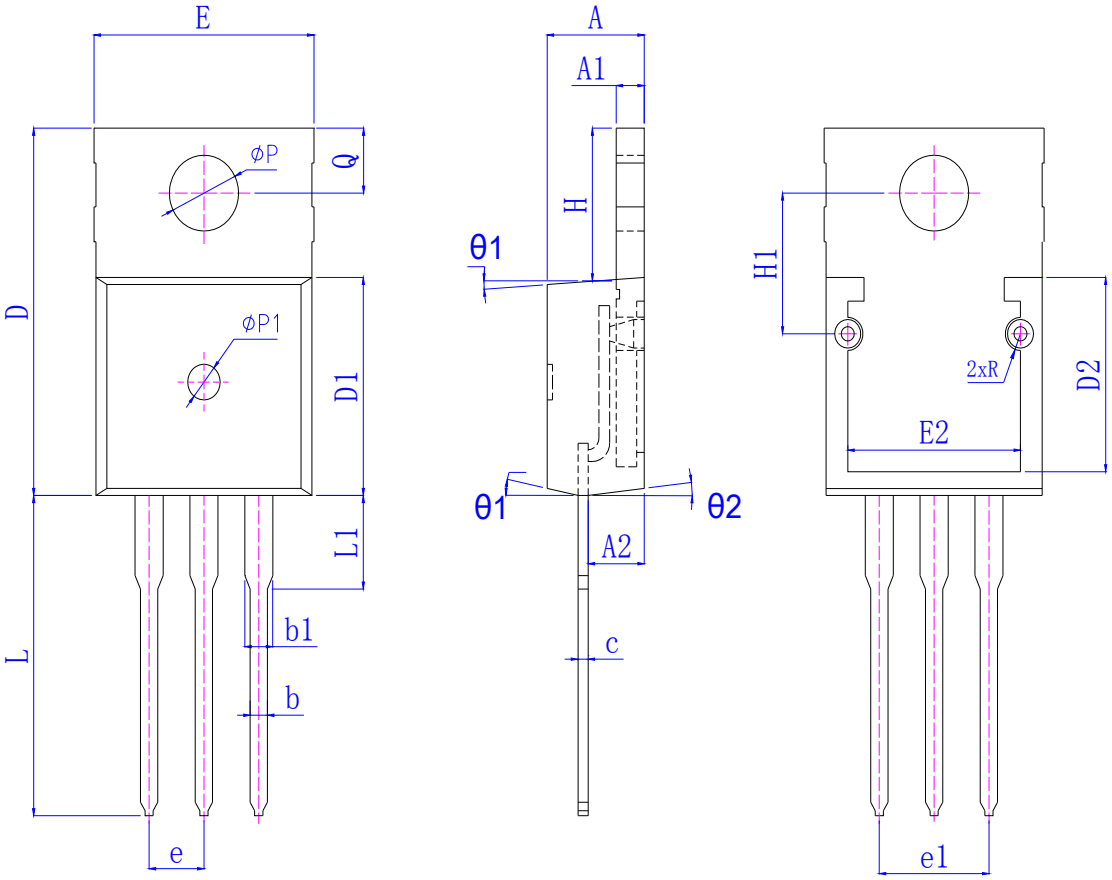

SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.30	4.50	4.70	0.169	0.177	0.185	Φp	3.20	*	3.30	0.126	*	0.130
A1	1.25	1.27	1.29	0.049	0.050	0.051	e	2.54 BSC			0.10 BSC		
A2	2.37	2.57	2.77	0.093	0.101	0.109	e1	5.08 BSC			0.20 BSC		
b	0.60	0.80	1.00	0.024	0.031	0.039	H	6.13	6.23	6.43	0.241	0.245	0.253
b1	1.24	1.34	1.44	0.049	0.053	0.057	H1	5.89	5.94	5.99	0.232	0.234	0.236
c	0.40	0.50	0.60	0.016	0.020	0.024	L	12.90	13.40	13.90	0.508	0.528	0.547
D	15.33	15.53	15.73	0.604	0.611	0.619	L1	*	*	3.92	*	*	0.154
D1	9.10	9.30	9.50	0.358	0.366	0.374	Φp1	1.40	1.50	1.60	0.055	0.059	0.063
D2	8.14	8.19	8.24	0.320	0.322	0.324	Q	*	2.74	*	*	0.108	*
E	10.10	10.20	10.30	0.398	0.402	0.406	R	0.675	0.700	0.725	0.027	0.028	0.029
E1	9.96	10.16	10.36	0.392	0.400	0.408	θ1	1°	3°	5°	1°	3°	5°
E2	8.13	8.18	8.23	0.320	0.322	0.324	θ2	1°	3°	5°	1°	3°	5°

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