

N-Channel 80 V (D-S) Super Junction MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^a	Q _g (Typ.)
80	1.6 at V _{GS} = 10 V	250	204 nC

FEATURES

- DT-SJ Power MOSFET
- Very low on-resistance
- Excellent gate charge x R_{DS(on)} product(FOM)

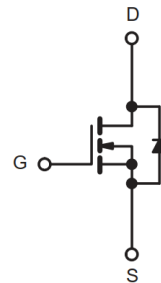
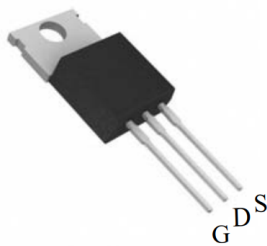


RoHS
COMPLIANT

APPLICATIONS

- Power Management
- Motor Drivers
- DC-DC Converters

TO-220 Pin Configuration



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	80	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	250
		T _C = 100 °C	190
Pulsed Drain Current	I _{DM}	875	A
Single Pulse Avalanche Energy	L = 0.5 mH E _{AS}	2303	mJ
Maximum Power Dissipation	P _D	T _C = 25 °C	267 ^c
		T _C = 100 °C	106
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)		260	

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^b	R _{thJA}	40	60	°C/W
Maximum Junction-to-Case (Drain)	R _{thJC}	0.4	0.47	

Notes:

- Based on T_C = 25 °C.
- Surface mounted on 1" x 1" FR4 board.
- See SOA curve for voltage derating

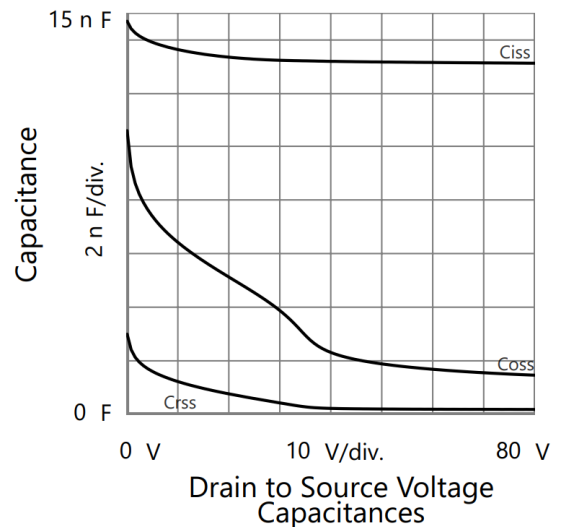
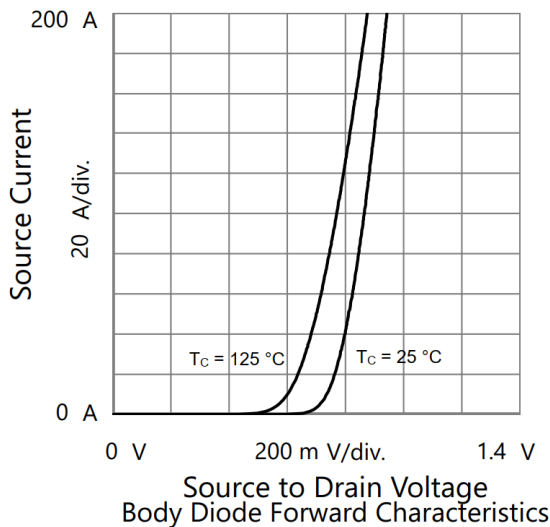
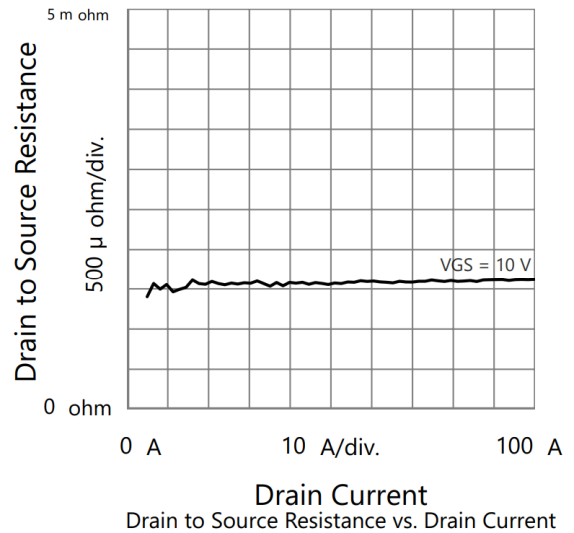
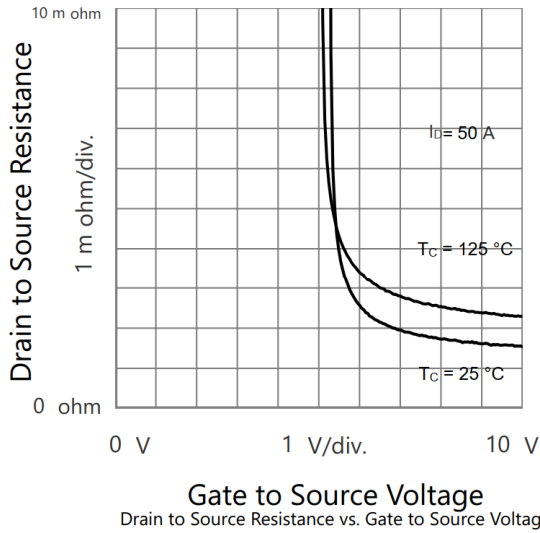
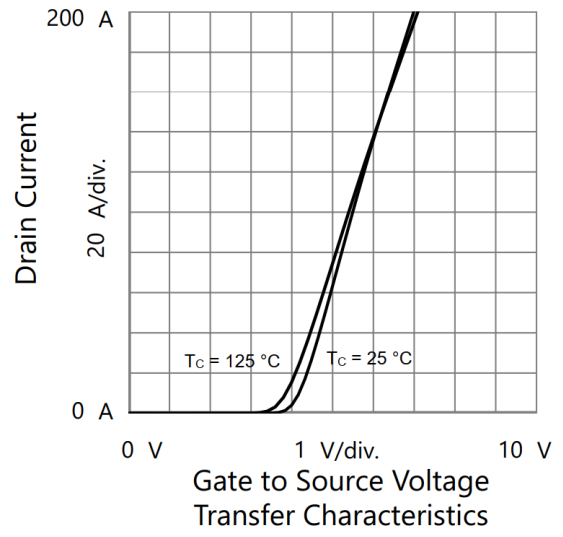
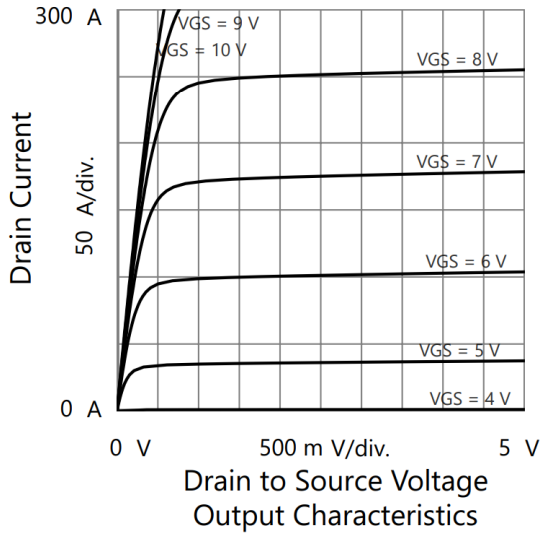
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	80	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2	-	4	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 64\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	-	10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	250	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 50\text{ A}$	-	1.6	2.2	m Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 40\text{ A}$	-	145	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 40\text{ V}, f = 1\text{ MHz}$	-	13200	-	pF
Output Capacitance	C_{oss}		-	2310	-	
Reverse Transfer Capacitance	C_{rss}		-	93	-	
Total Gate Charge ^c	Q_g	$V_{DS} = 40\text{ V}, V_{GS} = 10\text{ V}, I_D = 50\text{ A}$	-	204	-	nC
Gate-Source Charge ^c	Q_{gs}		-	50	-	
Gate-Drain Charge ^c	Q_{gd}		-	43	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	-	2	-	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 40\text{ V}, R_g = 6\text{ }\Omega,$ $V_{GEN} = 10\text{ V}$	-	35	-	ns
Rise Time ^c	t_r		-	133	-	
Turn-Off Delay Time ^c	$t_{d(off)}$		-	116	-	
Fall Time ^c	t_f		-	152	-	
Drain-Source Body Diode Ratings and Characteristics ^b ($T_C = 25\text{ }^\circ\text{C}$)						
Continuous Source Current	I_S	$T_C = 25\text{ }^\circ\text{C}$	-	-	250	A
Pulsed Source Current	I_{SM}		-	-	875	A
Forward Voltage ^a	V_{SD}	$I_F = 50\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.2	V
Reverse Recovery Time	t_{rr}	$I_F = 30\text{ A}, di/dt = 500\text{ A}/\mu\text{s}$	-	112	-	ns
Reverse Recovery Charge	Q_{rr}		-	315	-	nC

Notes

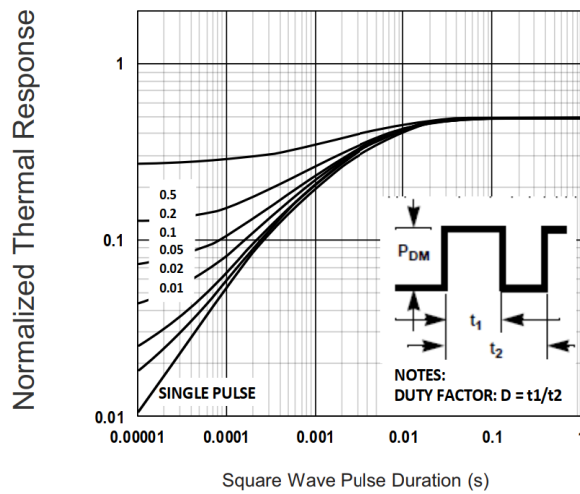
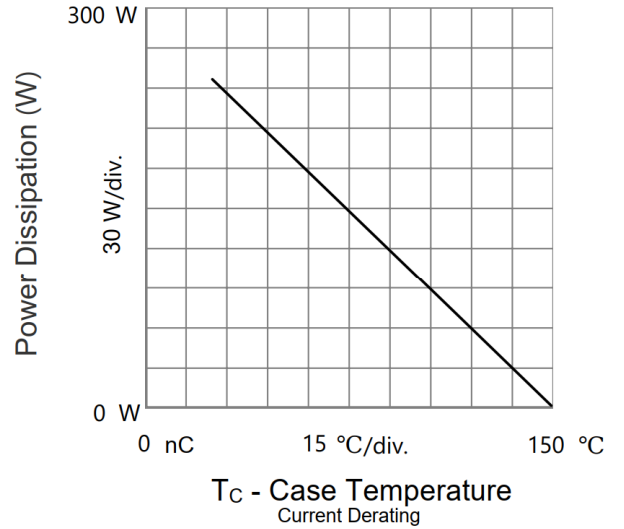
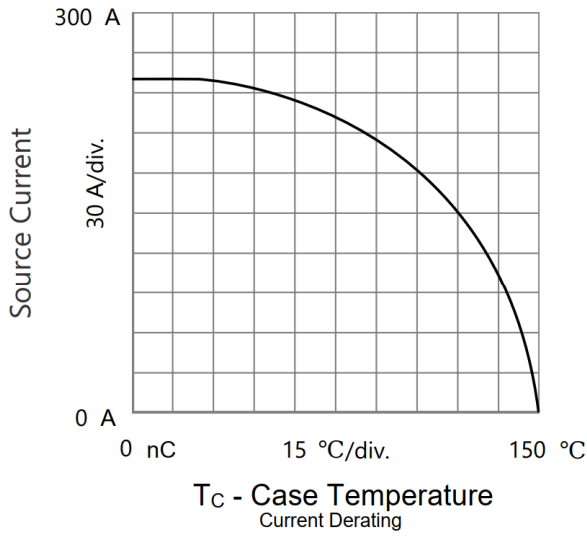
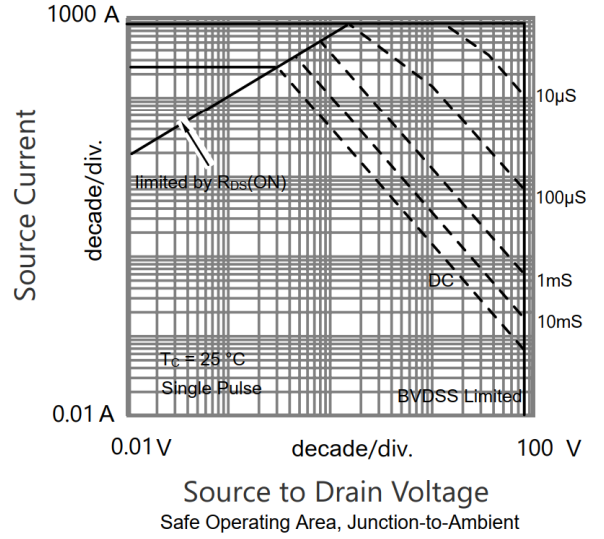
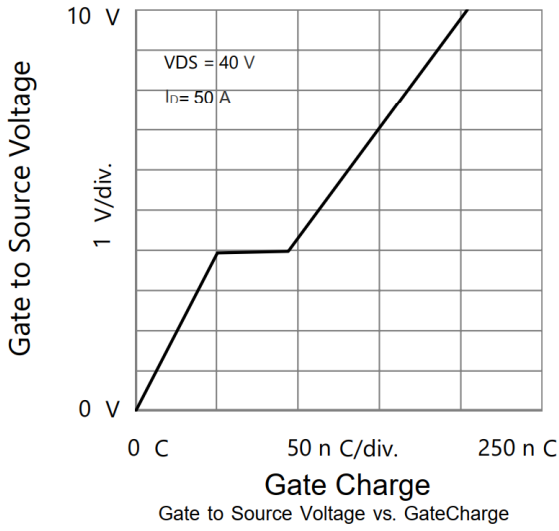
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)

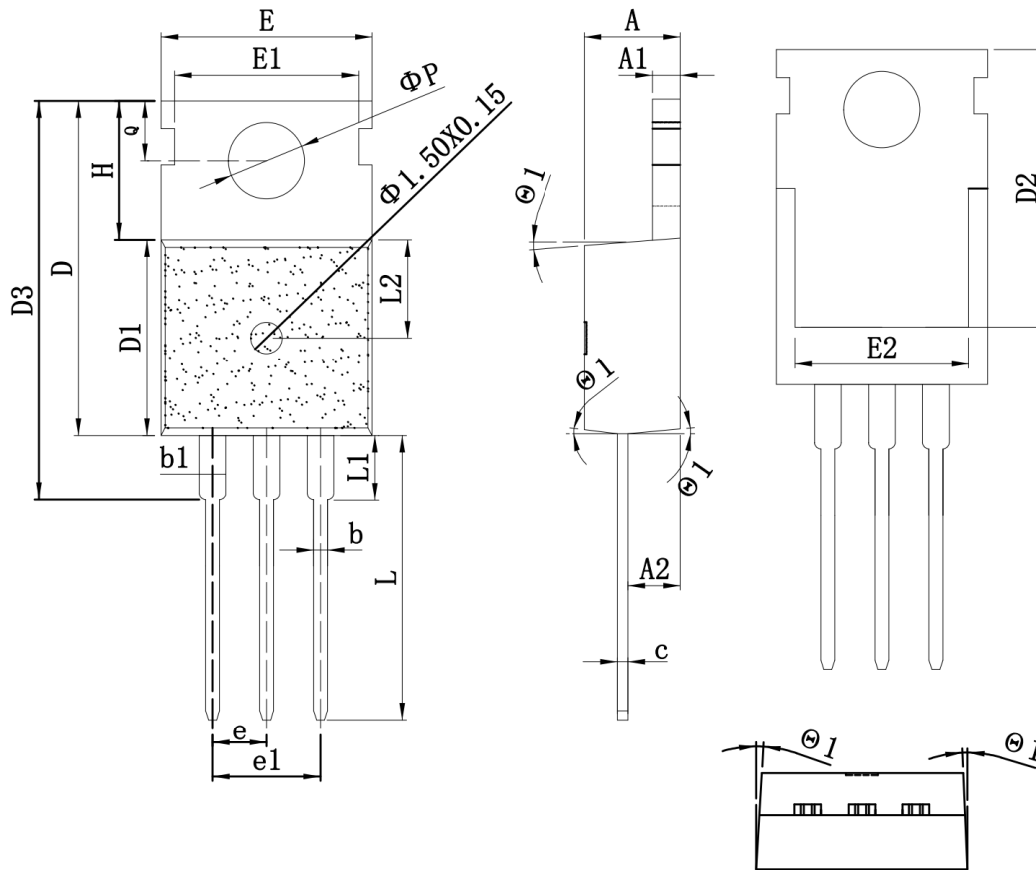


TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient

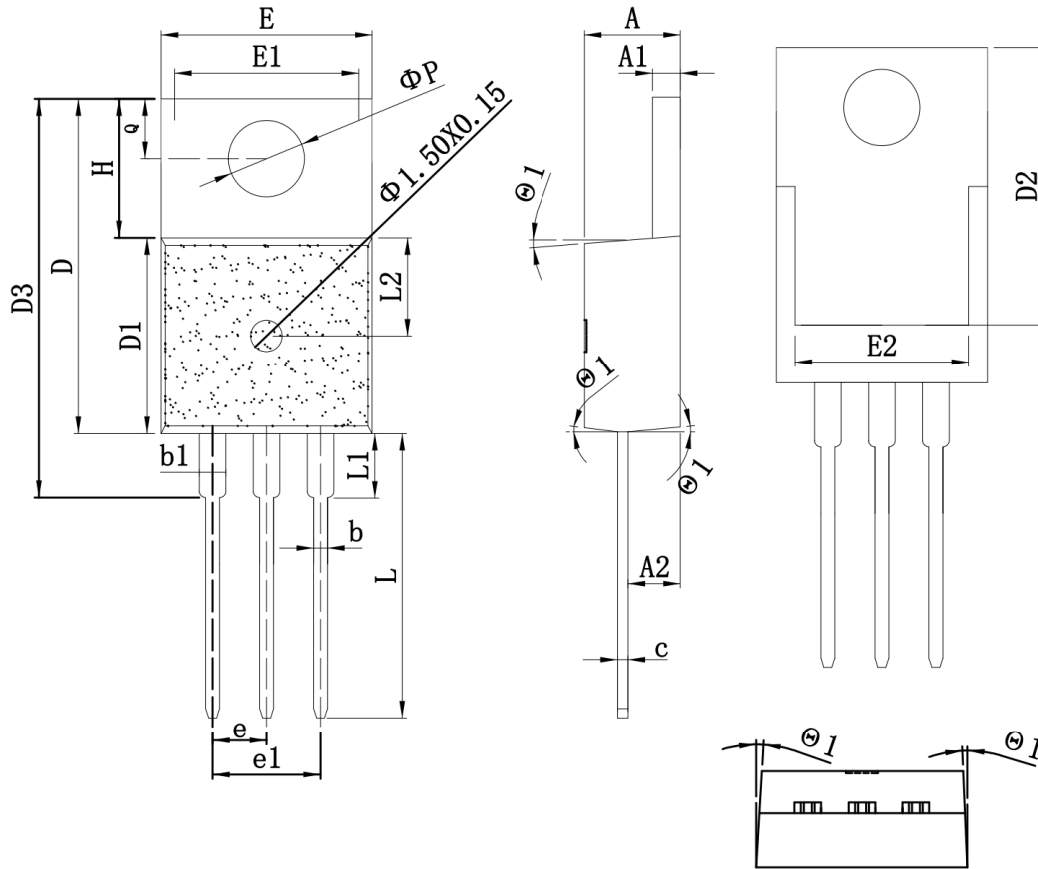
TO-220_3L-A PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	mm			SYMBOL	mm		
	MIN	TYP	MAX		MIN	TYP	MAX
A	4.15	4.50	4.80	E1	8.25	8.70	9.15
A1	1.15	1.30	1.50	E2	7.20	8.00	8.80
A2	2.10	2.40	2.65	e	2.38	2.54	2.74
b	0.65	0.80	1.00	e1	5.08REF		
b1	1.10	1.33	1.80	H	6.20	6.50	6.90
c	0.35	0.50	0.65	L	12.75	13.28	13.70
D	14.25	15.75	16.15	L1	-	-	3.50
D1	8.70	9.20	9.60	L2	2.30	4.65	7.00
D2	12.30	13.10	13.85	φP	3.40	3.65	3.85
D3	16.20	18.80	20.60	Q	2.50	2.80	3.00
E	8.68	10.02	11.00	θ	2°	-	7°

TO-220_3L-B PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	mm			SYMBOL	mm		
	MIN	TYP	MAX		MIN	TYP	MAX
A	4.15	4.50	4.80	E1	8.25	8.70	9.15
A1	1.15	1.30	1.50	E2	7.20	8.00	8.80
A2	2.10	2.40	2.65	e	2.38	2.54	2.74
b	0.65	0.80	1.00	e1	5.08REF		
b1	1.10	1.33	1.80	H	6.20	6.50	6.90
c	0.35	0.50	0.65	L	12.75	13.28	13.70
D	14.25	15.75	16.15	L1	-	-	3.50
D1	8.70	9.20	9.60	L2	2.30	4.65	7.00
D2	12.30	13.10	13.85	φP	3.40	3.65	3.85
D3	16.20	18.80	20.60	Q	2.50	2.80	3.00
E	8.68	10.02	11.00	θ	2°	-	7°

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