

N-Channel 250 V (D-S) Power MOSFET



PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (mΩ) (TYP.)	I _D (A)	Q _g (TYP.)
250	16 at V _{GS} = 10 V	80	86 nC

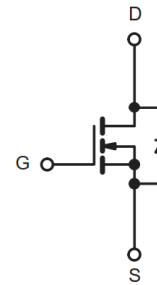
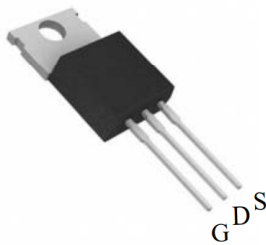
FEATURES

- DT-Trench Power MOSFET
- Very low on-resistance R_{DS(on)}
- 100% R_g and UIS Tested

APPLICATIONS

- Networking
- DC/DC Converter

TO-220 Pin Configuration



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V _{DS}	250	V
Gate-Source Voltage		V _{GS}	± 20	
Continuous Drain Current (T _J = 175 °C)	T _C = 25 °C	I _D	80	A
	T _C = 100 °C		56.6	
Pulsed Drain Current		I _{DM}	320	
Avalanche Current	L = 0.1 mH	I _{AS}	70	mJ
Single Avalanche Energy ^a		E _{AS}	1200	
Maximum Power Dissipation ^a	T _C = 25 °C	P _D	300 ^b	W
	T _C = 100 °C		150 ^b	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-Case (Drain)		R _{thJC}	0.5	°C/W

Notes

- Duty cycle ≤ 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR4 material).

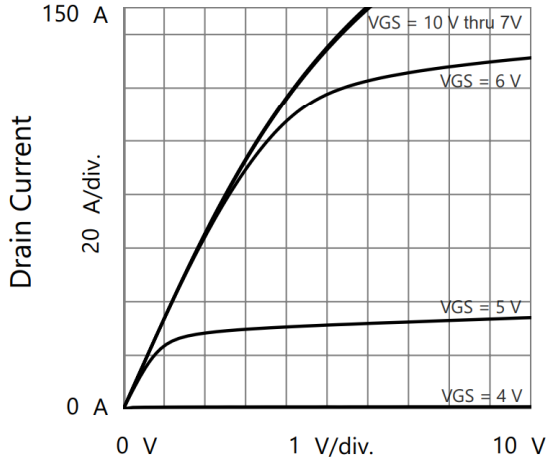
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	250	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2	-	4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 250 V, V _{GS} = 0 V	-	-	1	μA
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	80	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 40 A	-	16	18.5	mΩ
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 40 A	70	-	-	S
Dynamic ^b						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, V _{DS} = 125 V, f = 1MHz	-	5750	-	pF
Output Capacitance	C _{OSS}		-	298	-	
Reverse Transfer Capacitance	C _{RSS}		-	25	-	
Total Gate Charge ^c	Q _g	V _{DS} = 125 V, V _{GS} = 10 V, I _D = 40 A	-	86	-	nC
Gate-Source Charge ^c	Q _{gs}		-	22	-	
Gate-Drain Charge ^c	Q _{gd}		-	18	-	
Gate Resistance	R _g	f = 1 MHz	-	3	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 125 V, R _g = 4.7 Ω I _D = 40 A, V _{GEN} = 10 V	-	18	-	ns
Rise Time ^c	t _r		-	26	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	40	-	
Fall Time ^c	t _f		-	11	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T_C = 25 °C)						
Continuous Source Current	I _S	T _C = 25 °C	-	-	80	A
Pulsed Source Current	I _{SM}		-	-	320	A
Forward Voltage ^a	V _{SD}	I _F = 40 A, V _{GS} = 0 V	-	-	1.2	V
Reverse Recovery Time	t _{rr}	I _F = 40 A, di/dt = 100 A/μs	-	140	-	ns
Reverse Recovery Charge	Q _{rr}		-	600	-	nC

Notes

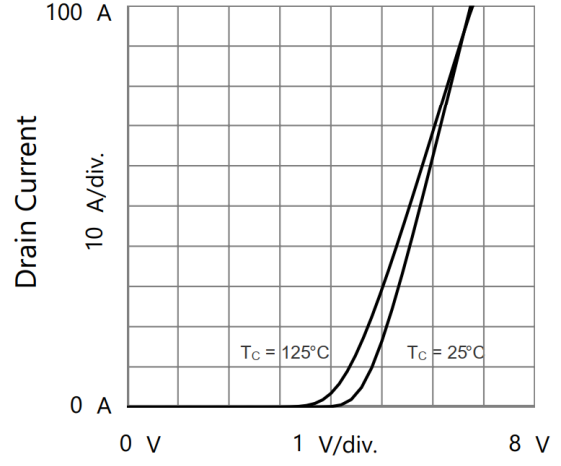
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

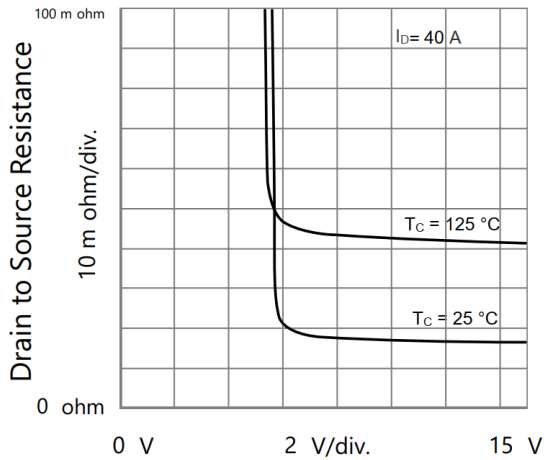
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



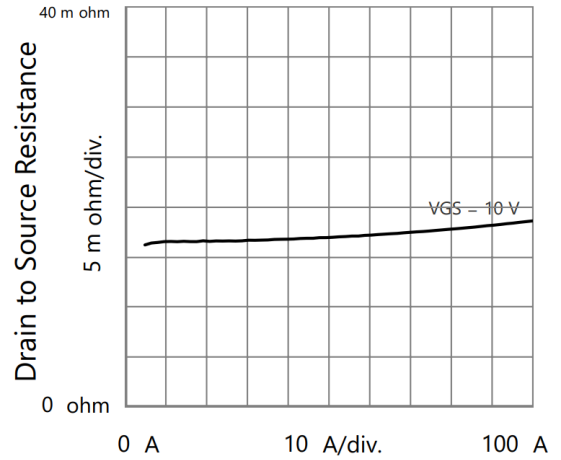
Drain to Source Voltage
Output Characteristics



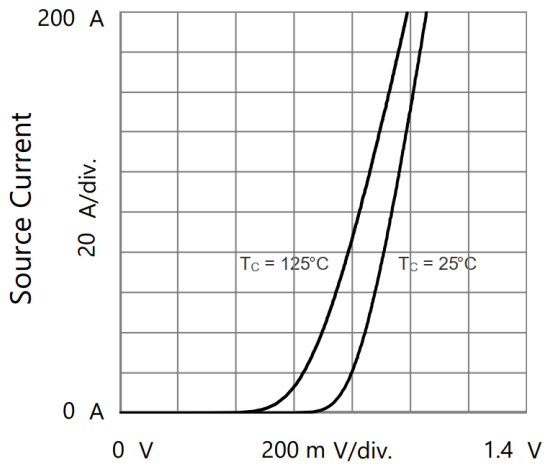
Gate to Source Voltage
Transfer Characteristics



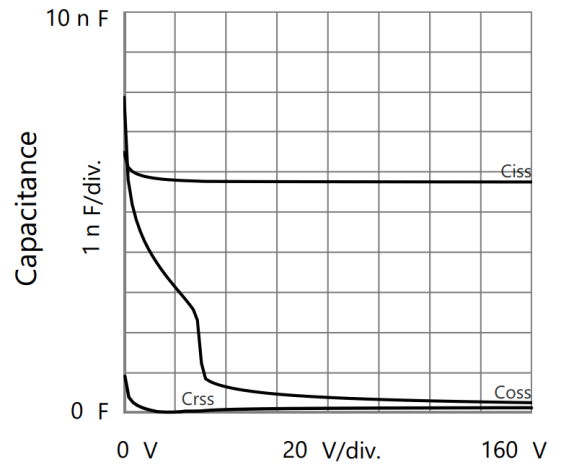
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

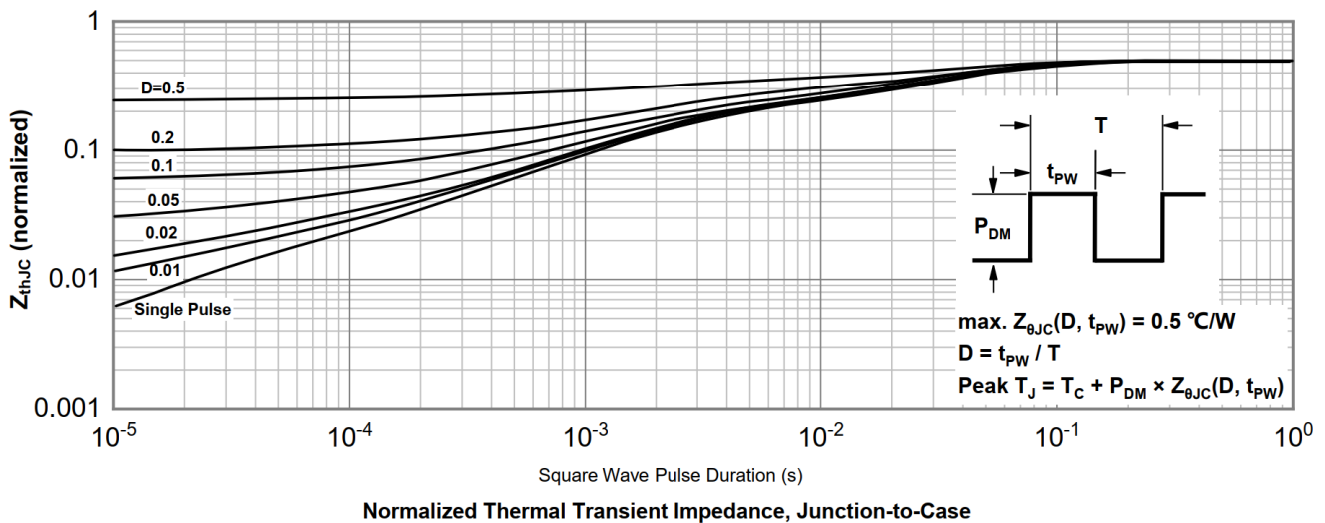
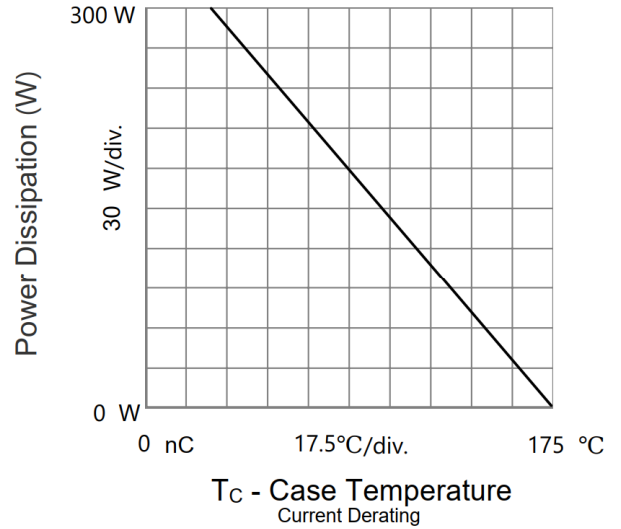
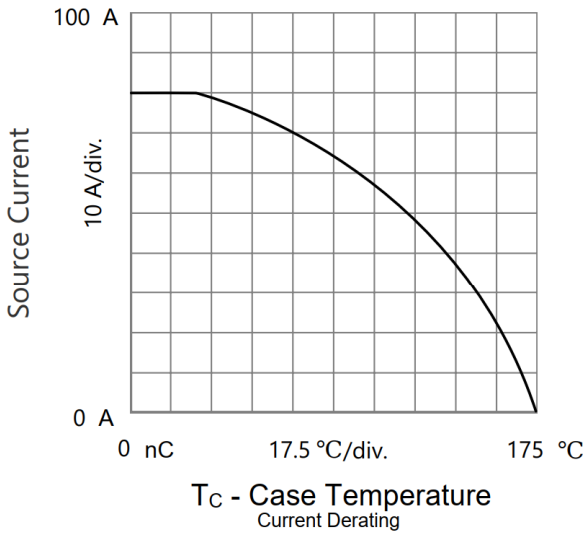
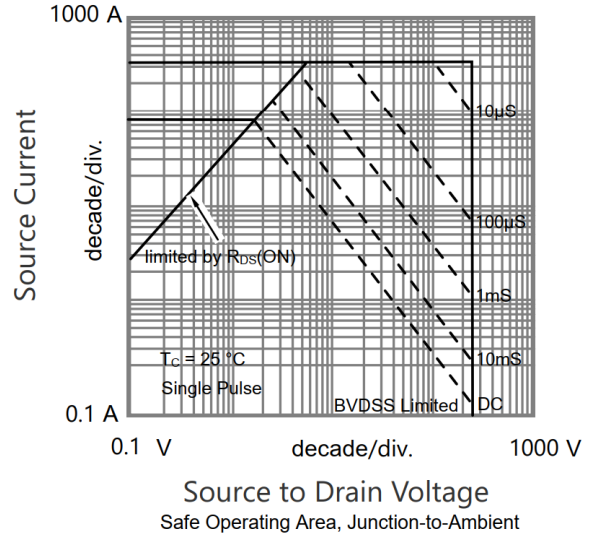
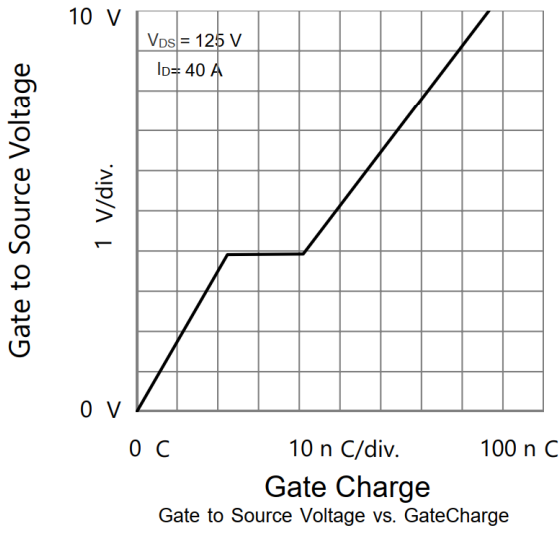


Source to Drain Voltage
Body Diode Forward Characteristics

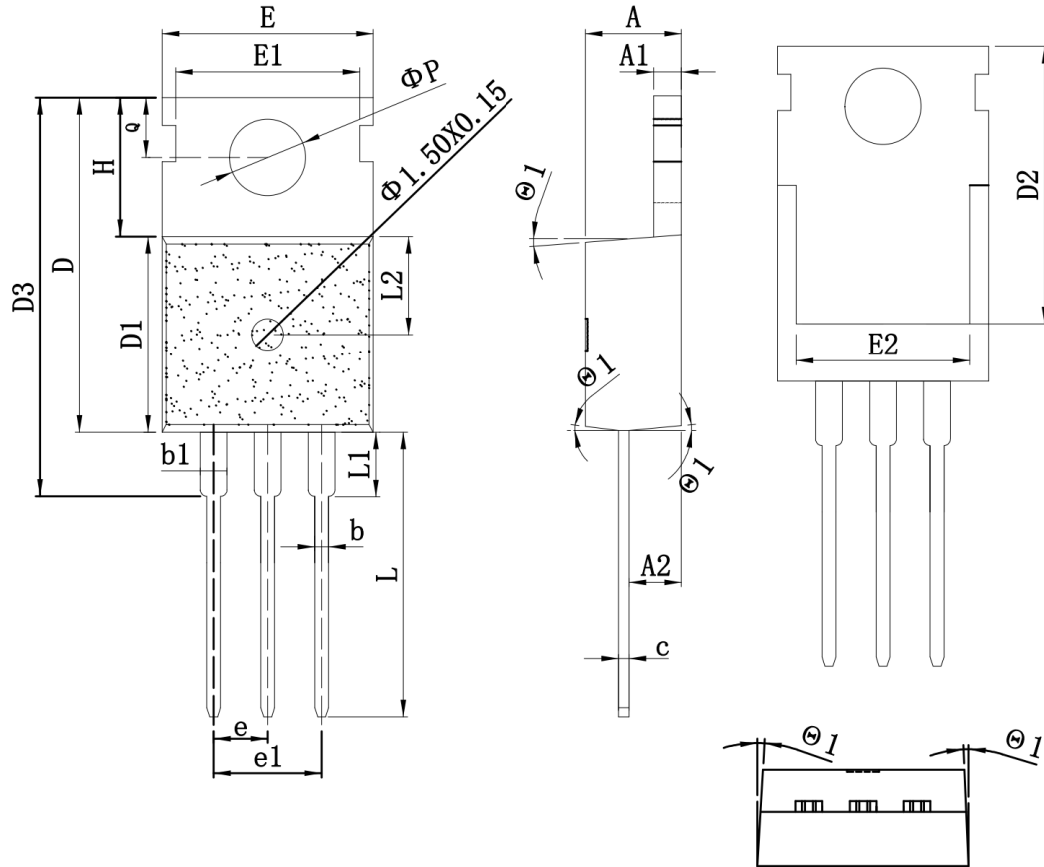


Drain to Source Voltage
Capacitances

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



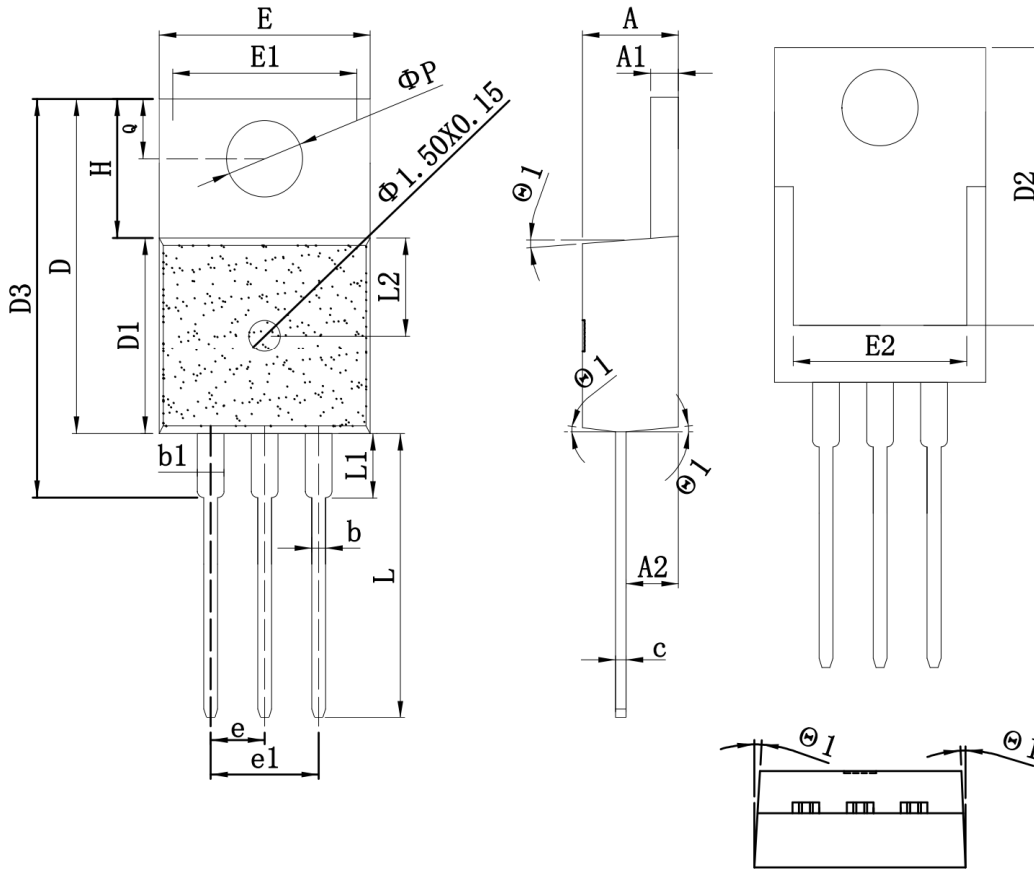
TO-220_3L-A PACKAGE OUTLINE



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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