

N-Channel 100 V (D-S) MOSFET

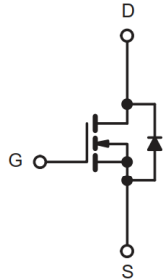
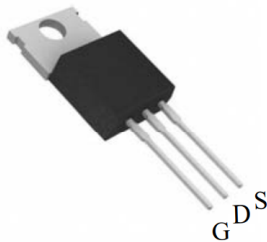


RoHS
COMPLIANT

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ)(TYP.)	I _D (A)	Q _g (TYP.)
100	1.7 at V _{GS} = 10 V	280	191 nC

TO-220 Pin Configuration



N-Channel MOSFET

FEATURES

- Maximum 175 °C junction temperature
- 100 % R_g and UIS tested

APPLICATIONS

- Power supplies:
 - Uninterruptible power supplies
 - AC/DC switch-mode power supplies
 - Lighting
- Synchronous rectification
- DC/DC converter
- Motor drive switch
- DC/AC inverter
- Battery management

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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	280
		T _C = 100 °C	153
Pulsed Drain Current (t = 100 μs)	I _{DM}	1120	A
Avalanche Current	I _{AS}	155	
Single Avalanche Energy ^a	E _{AS}	2388	mJ
Maximum Power Dissipation ^a	P _D	T _C = 25 °C	415 ^b
		T _C = 100 °C	166 ^b
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^c	R _{thJA}	65	°C/W
Junction-to-Case (Drain)	R _{thJC}	0.35	

Notes

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

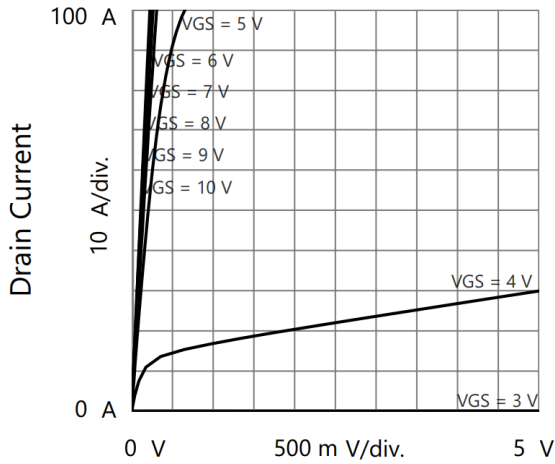
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	100	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1	-	3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 80 V, V _{GS} = 0 V, T _J = 125 °C	-	-	100	
		V _{DS} = 80 V, V _{GS} = 0 V, T _J = 175 °C	-	-	2	mA
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	280	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 30 A	-	1.7	2.2	mΩ
		V _{GS} = 4.5 V, I _D = 15 A	-	2.6	3.3	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 3 A	-	55	-	S
Dynamic ^b						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, V _{DS} = 50 V, f = 1 MHz	-	12500	-	pF
Output Capacitance	C _{OSS}		-	2910	-	
Reverse Transfer Capacitance	C _{rss}		-	92	-	
Total Gate Charge ^c	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 30 A	-	191	-	nC
Gate-Source Charge ^c	Q _{gs}		-	112	-	
Gate-Drain Charge ^c	Q _{gd}		-	13.1	-	
Gate Resistance	R _g	f = 1 MHz	-	2.7	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 50 V, R _L = 1.67 Ω I _D ≅ 30 A, V _{GEN} = 10 V, R _g = 1 Ω	-	43	-	ns
Rise Time ^c	t _r		-	52	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	107	-	
Fall Time ^c	t _f		-	79	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T_C = 25 °C)						
Pulsed Current (t = 100 μs)	I _{SM}		-	-	1120	A
Forward Voltage ^a	V _{SD}	I _F = 30 A, V _{GS} = 0 V	-	-	1.2	V
Reverse Recovery Time	t _{rr}	I _F = 30 A, di/dt = 100 A/μs	-	88	-	ns
Peak Reverse Recovery Charge	I _{RM(REC)}		-	5	-	A
Reverse Recovery Charge	Q _{rr}		-	300	-	nC

Notes

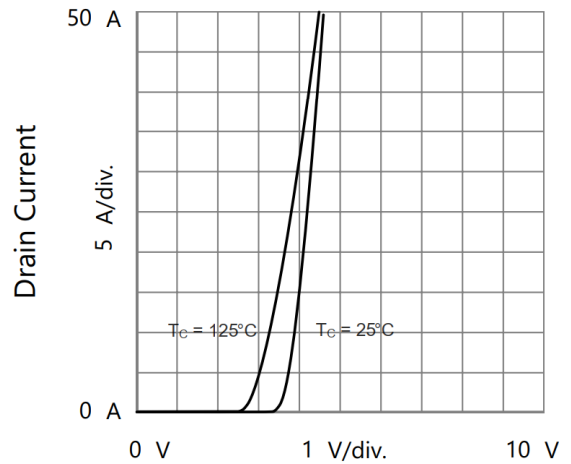
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

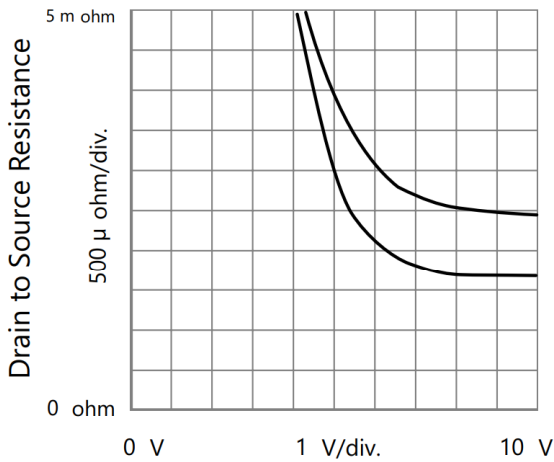
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)



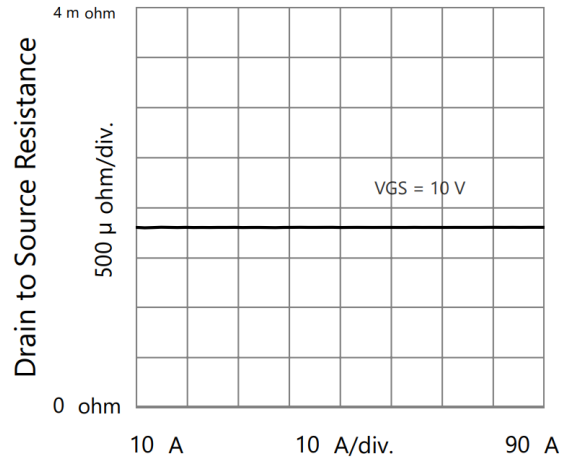
Drain to Source Voltage
Output Characteristics



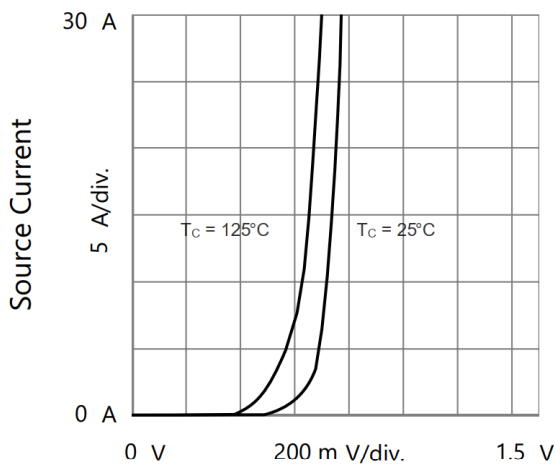
Gate to Source Voltage
Transfer Characteristics



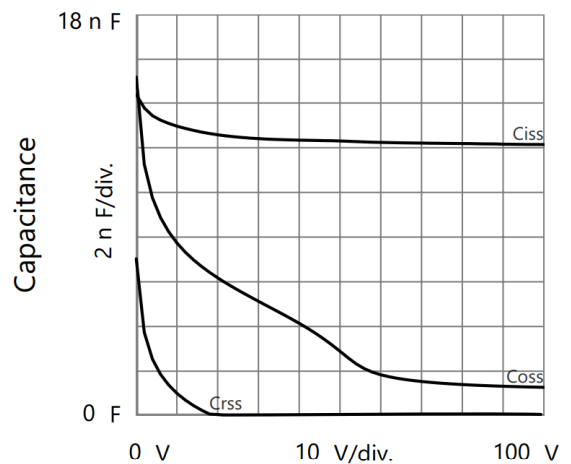
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

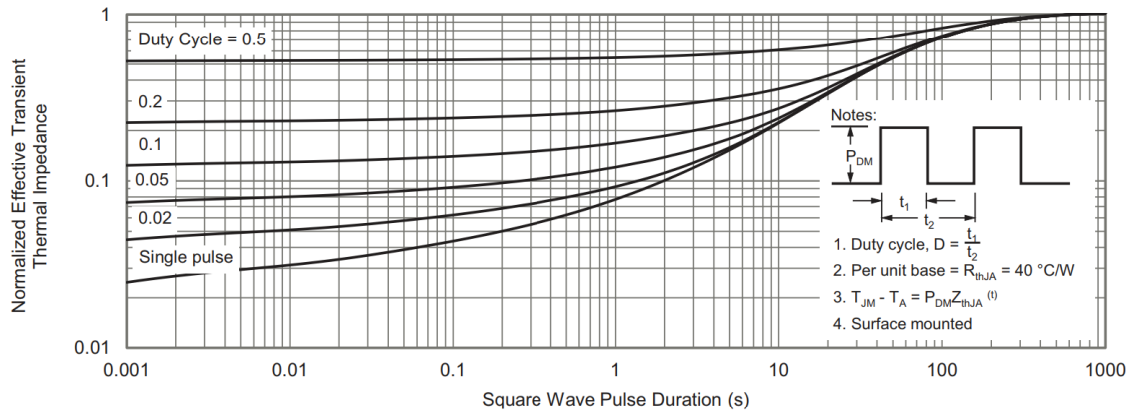
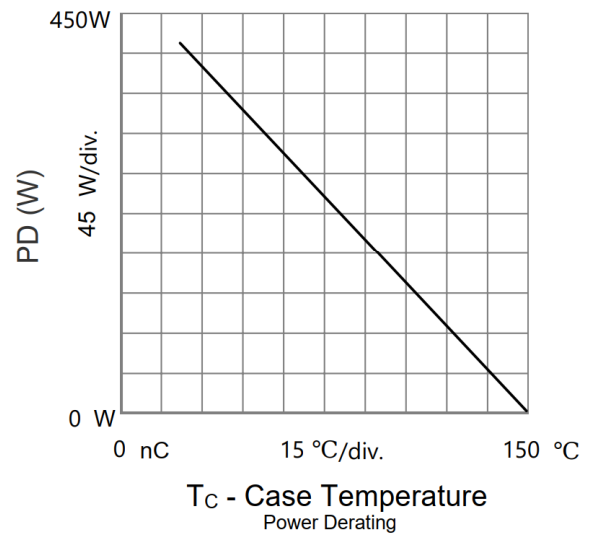
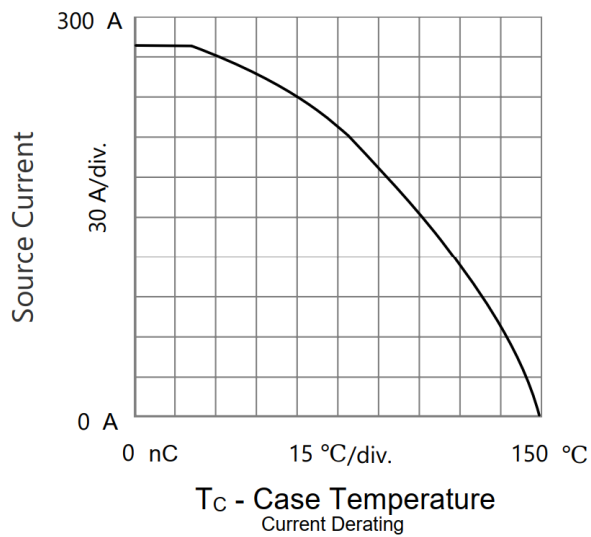
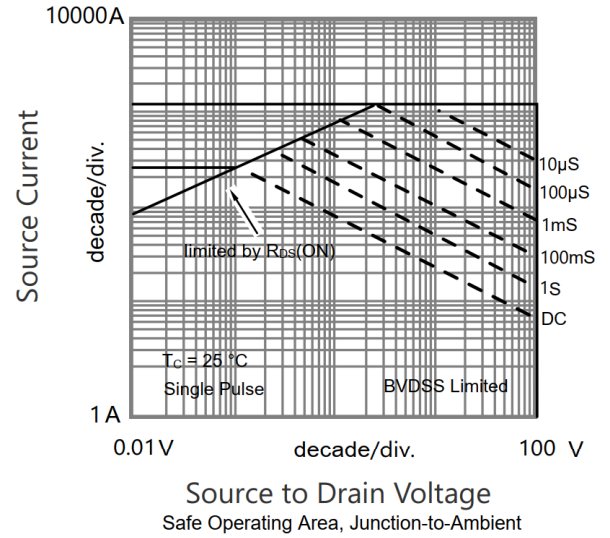
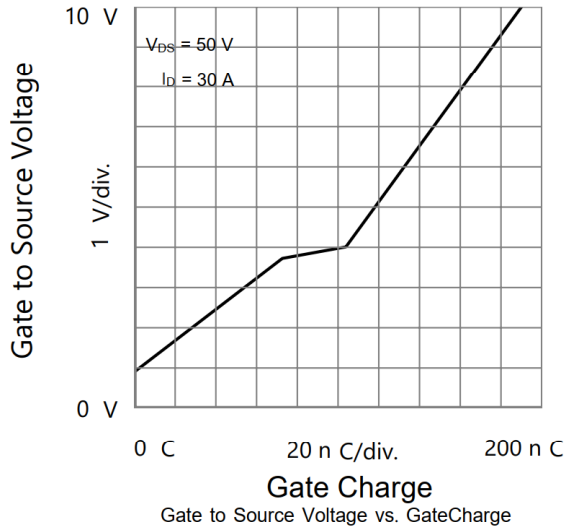


Source to Drain Voltage
Body Diode Forward Characteristics

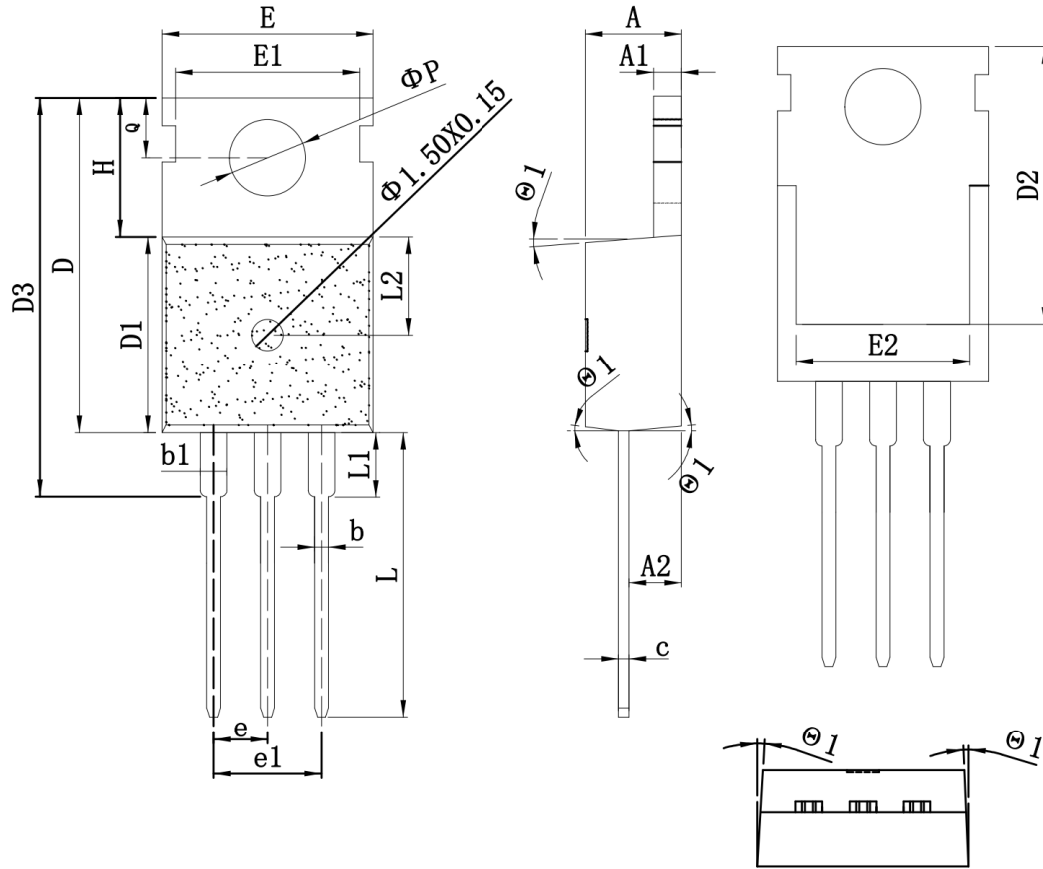


Drain to Source Voltage
Capacitances

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



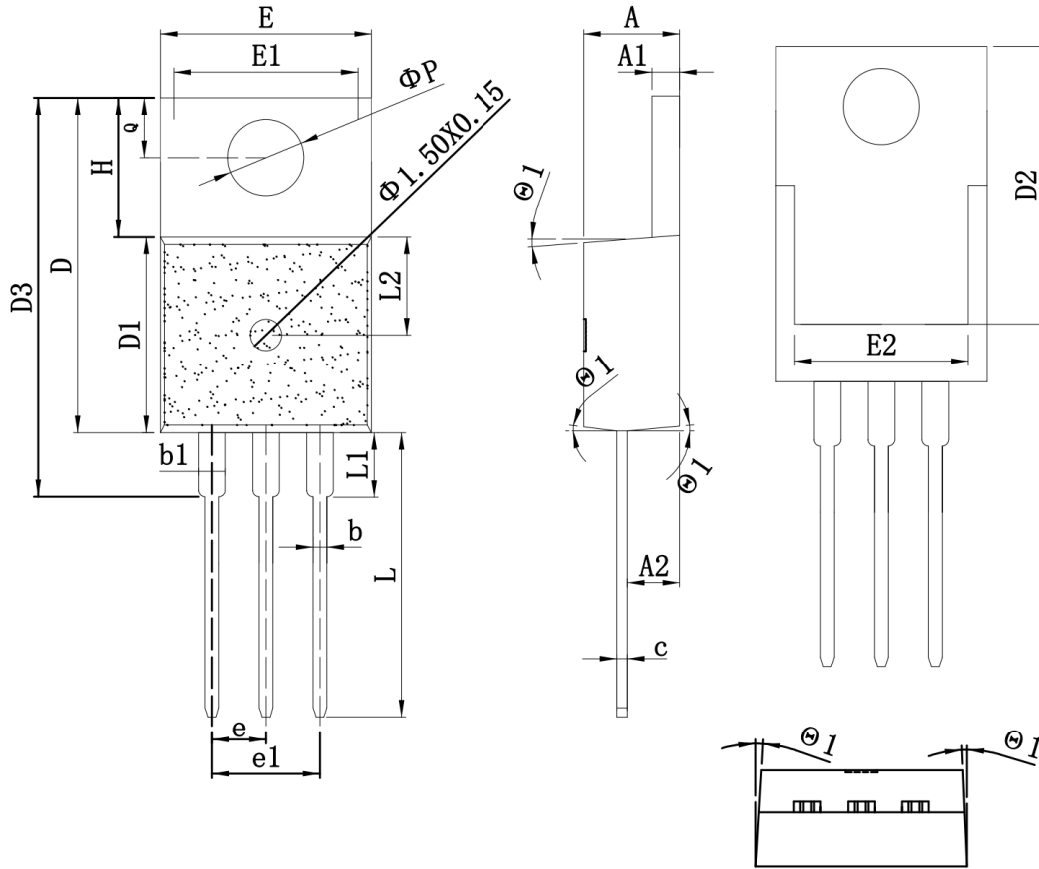
TO-220_3L-A PACKAGE OUTLINE



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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