

LinearL2™ Power MOSFET w/ Extended FBSOA

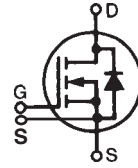
IXTN240N075L2

$$V_{DSS} = 75V$$

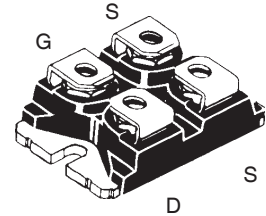
$$I_{D25} = 225A$$

$$R_{DS(on)} \leq 7m\Omega$$

N-Channel Enhancement Mode
Avalanche Rated



miniBLOC, SOT-227
E153432



G = Gate
S = Source
D = Drain

Either Source Terminal S can be used as the Source Terminal or the Kelvin Source (Gate Return) Terminal.

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	75	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	75	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ C$ (Chip Capability)	225	A
$I_{L(RMS)}$	External Lead Current Limit	200	A
I_{DM}	$T_C = 25^\circ C$, pulse width limited by T_{JM}	720	A
I_A	$T_C = 25^\circ C$	240	A
E_{AS}	$T_C = 25^\circ C$	3	J
P_D	$T_C = 25^\circ C$	735	W
T_J		-55...+150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55...+150	$^\circ C$
V_{ISOL}	50/60 Hz, RMS	$t = 1$ minute	2500 V~
	$I_{ISOL} \leq 1mA$	$t = 1$ second	3000 V~
M_d	Mounting Torque	1.5/13	Nm/lb.in
	Terminal Connection Torque	1.3/11.5	Nm/lb.in
Weight		30	g

Features

- Designed for Linear Operation
- International Standard Package
- Guaranteed FBSOA at $75^\circ C$
- Avalanche Rated
- Molding Epoxy Meets UL94 V-0 Flammability Classification
- MiniBLOC with Aluminium Nitride Isolation

Advantages

- Easy to mount
- Space savings
- High power density

Applications

- Solid state circuit breakers
- Soft start controls
- Linear amplifiers
- Programmable loads
- Current regulators

Symbol	Test Conditions ($T_J = 25^\circ C$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 1mA$	75		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 3mA$	2.0		4.5 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ C$			10 μA
				50 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 120A$, Note 1			7 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}$, $I_D = 60\text{A}$, Note 1	60	86	110 S
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		19	nF
C_{oss}			4420	pF
C_{rss}			1470	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 120\text{A}$ $R_G = 1\Omega$ (External)		34	ns
t_r			200	ns
$t_{d(off)}$			136	ns
t_f			47	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 120\text{A}$		546	nC
Q_{gs}			86	nC
Q_{gd}			225	nC
R_{thJC}				0.17 $^\circ\text{C/W}$
R_{thCS}			0.05	$^\circ\text{C/W}$

Safe Operating Area Specification

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
SOA	$V_{DS} = 75\text{V}$, $I_D = 5.9\text{A}$, $T_C = 75^\circ\text{C}$, $T_p = 5\text{s}$	440		W

Source-Drain Diode

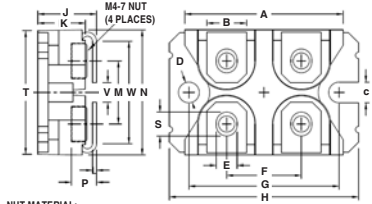
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			240 A
I_{SM}	Repetitive, pulse width limited by T_{JM}			960 A
V_{SD}	$I_F = 100\text{A}$, $V_{GS} = 0\text{V}$, Note 1			1.5 V
t_{rr}	$I_F = 120\text{A}$, $-di/dt = 100\text{A}/\mu\text{s}$, $V_R = 37.5\text{V}$, $V_{GS} = 0\text{V}$		206	ns
I_{RM}			18.8	A
Q_{RM}			1.9	μC

Note: 1. Pulse test, $t \leq 300\mu\text{s}$; duty cycle, $d \leq 2\%$.

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

TO-227 Outline



NUT MATERIAL:
STANDARD - Low carbon steel with
Ni plating.
OPTIONAL - Brass Nut is available
PART NUMBER-BN

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.489	1.505	37.80	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1
V	.130	.180	3.30	4.57
W	.780	.830	19.81	21.08

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2
by one or more of the following U.S. patents: 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2
4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

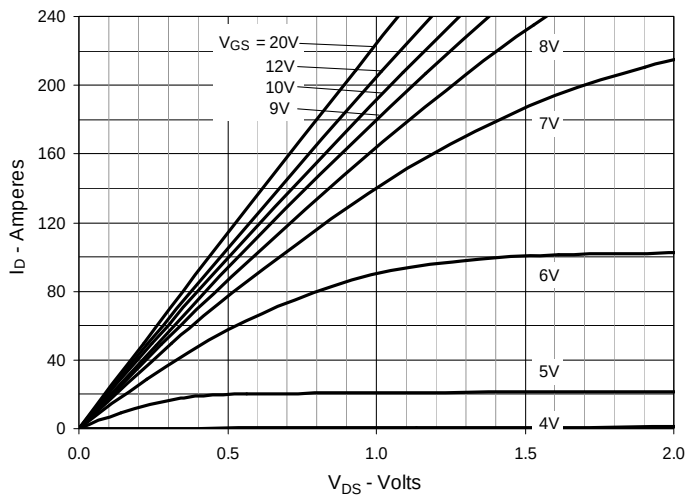


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

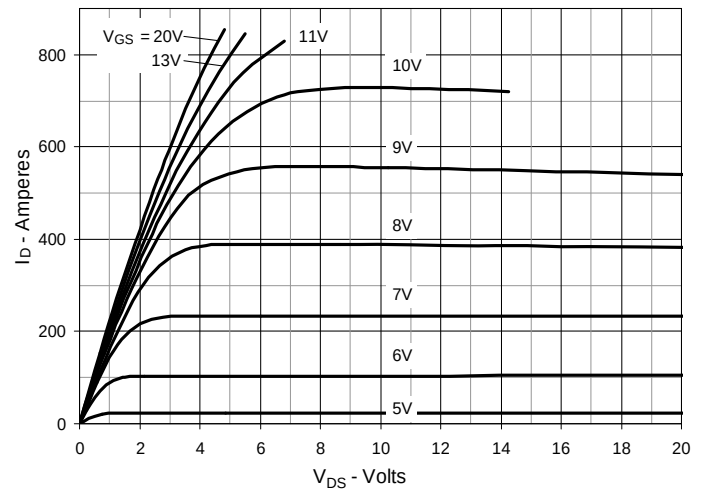


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

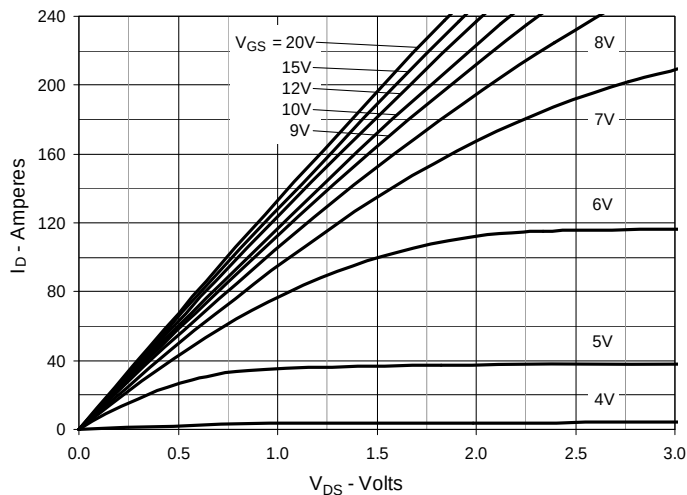


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 120\text{A}$ Value vs. Junction Temperature

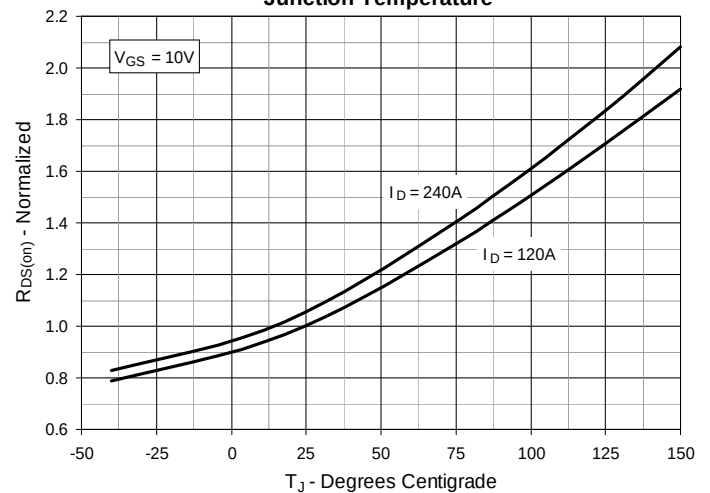


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 120\text{A}$ Value vs. Drain Current

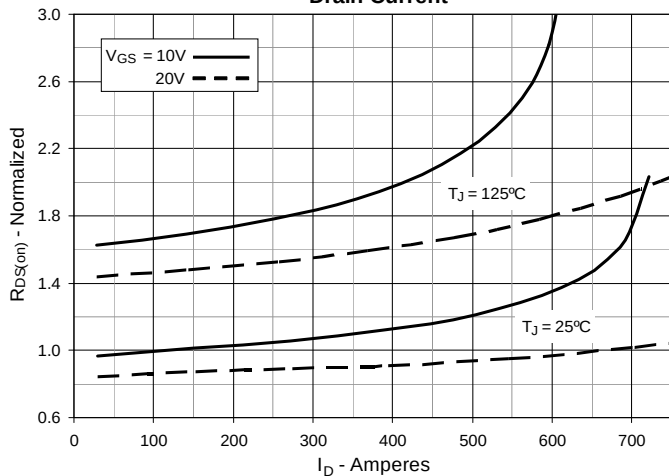


Fig. 6. Maximum Drain Current vs. Case Temperature

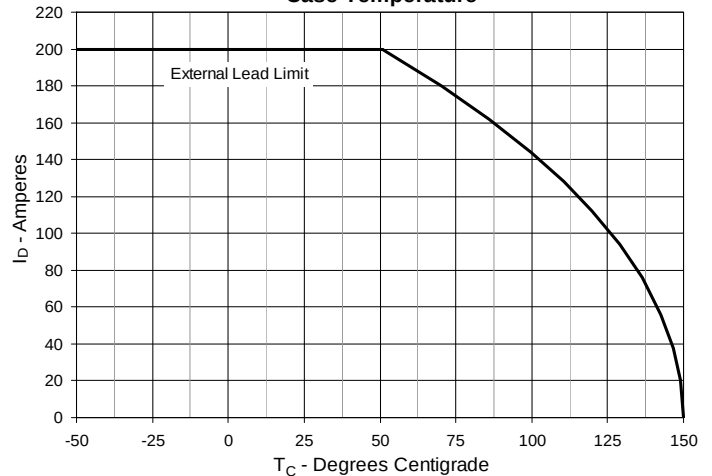


Fig. 7. Input Admittance

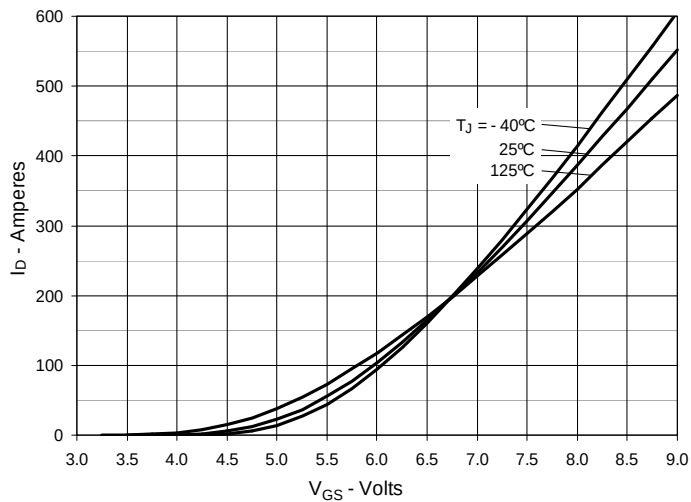


Fig. 8. Transconductance

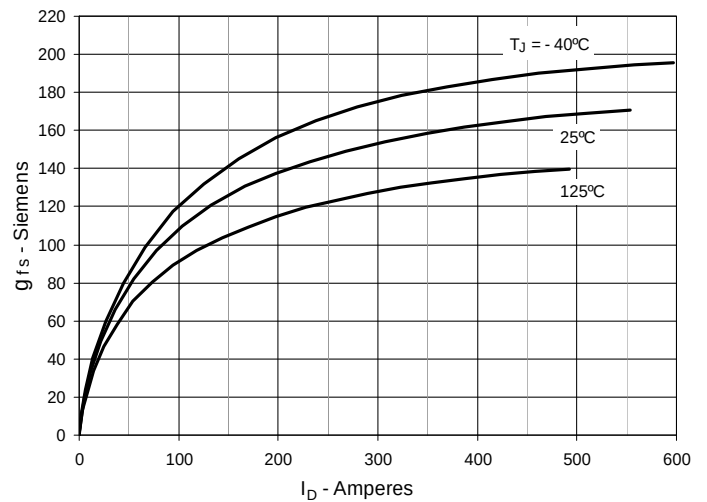


Fig. 9. Forward Voltage Drop of Intrinsic Diode

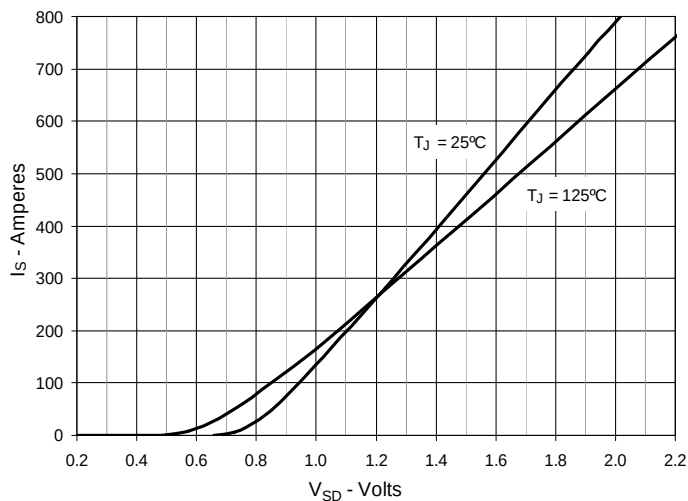


Fig. 10. Gate Charge

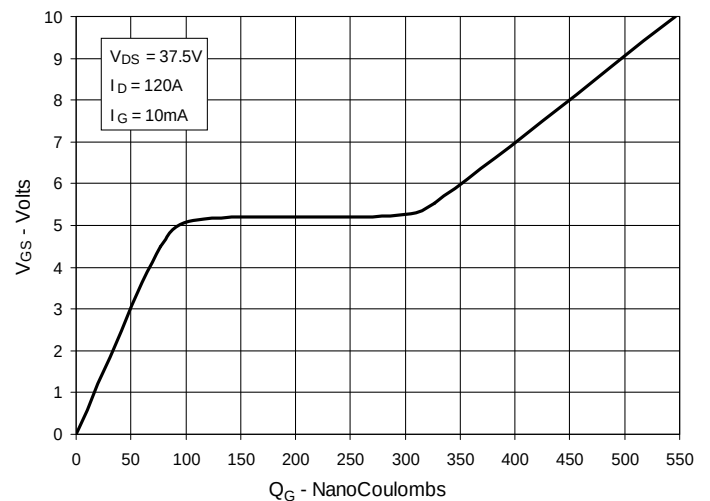


Fig. 11. Capacitance

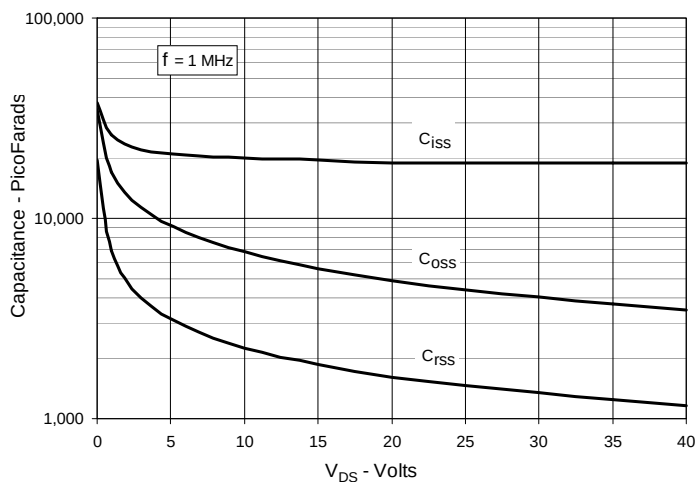


Fig. 12. Maximum Transient Thermal Impedance

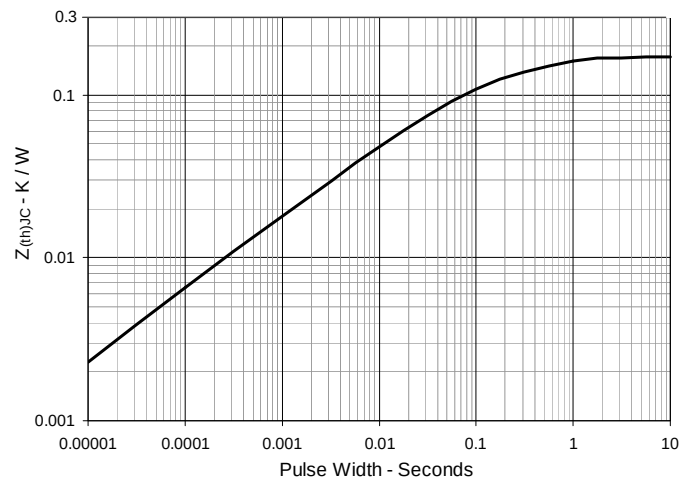
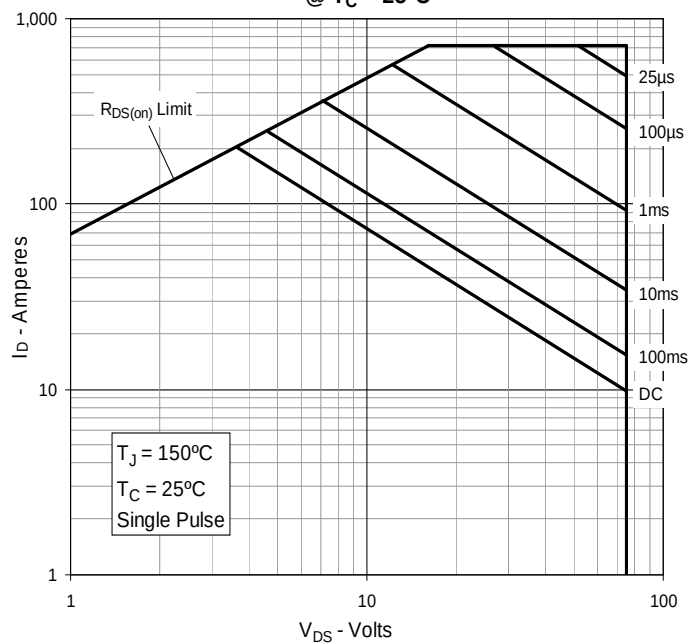
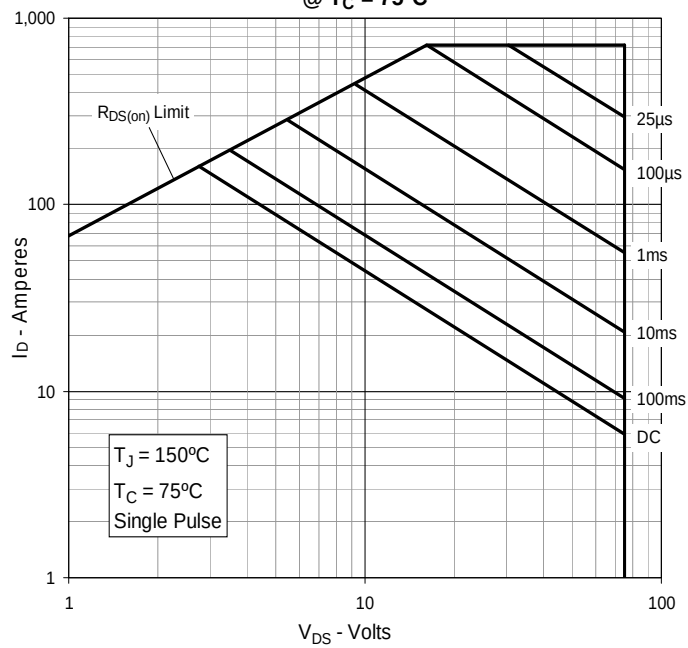


Fig. 13. Forward-Bias Safe Operating Area
@ $T_C = 25^\circ\text{C}$

Fig. 14. Forward-Bias Safe Operating Area
@ $T_C = 75^\circ\text{C}$




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