
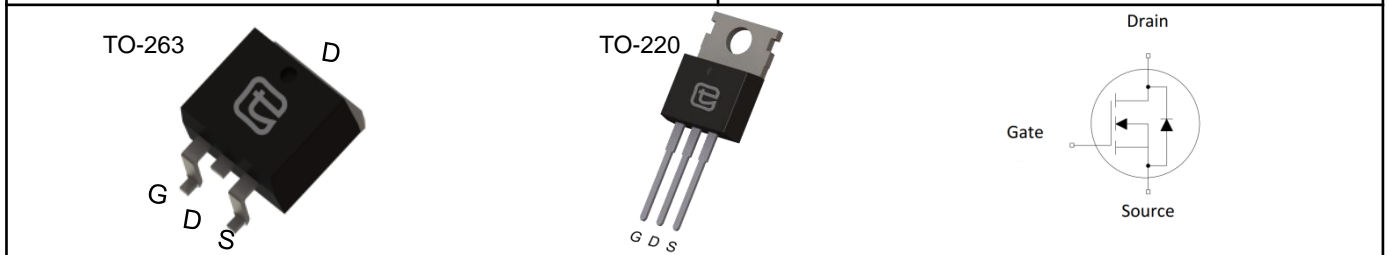




85V N-Channel Trench MOSFET(Preliminary)

<p>General Description</p> <ul style="list-style-type: none"> ● Trench Power Technology ● Low $R_{DS(ON)}$ ● Low Gate Charge ● Optimized for fast-switching Applications <p>Applications</p> <ul style="list-style-type: none"> ● Synchronous Rectification in DC/DC and AC/DC Converters ● Isolated DC/DC Converters in Telecom and Industrial 	<p>Product Summary</p> <p>V_{DS} 85V</p> <p>I_D (at $V_{GS}=10V$) 85A</p> <p>$R_{DS(ON)}$ (at $V_{GS}=10V$) < 9mΩ</p> <p>100% UIS Tested</p> 
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Device	Package	Form	Marking
TTB85N08A	TO-263	Tape & Reel	85N08A
TTP85N08A	TO-220	Tube	85N08A

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)			
Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^B	I_D	$T_C = 25^\circ C$	85
		$T_C = 100^\circ C$	55
Pulsed Drain Current ^A	I_{DM}	255	A
Avalanche Current ^A	I_{AS}	40	A
Single Pulse Avalanche Energy $L = 0.3mH$ ^A	E_{AS}	240	mJ
Power Dissipation ^C	P_D	$T_C = 25^\circ C$	160
		$T_C = 100^\circ C$	78
Operating Junction and Storage Temperature Range	T_J, T_{SGT}	-55 to 175	$^\circ C$

Thermal Resistance			
Parameter		Symbol	Units
Thermal Resistance, Junction-to-Case	Steady-State	R_{thJC}	0.95
Thermal Resistance, Junction-to-Ambient	Steady-State	R_{thJA}	100



Electrical Characteristics($T_J = 25^\circ\text{C}$ unless otherwise noted)							
Symbol	Parameter	Conditions	Value			Units	
			Min	Typ	Max		
STATIC PARAMETERS							
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	85	--	--	V	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 85\text{V}, V_{GS} = 0\text{V}$	$T_J = 25^\circ\text{C}$	--	--	1	μA
			$T_J = 100^\circ\text{C}$	--	--	25	
I_{GSS}	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	--	--	± 100	nA	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2	3	4	V	
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{V}, I_D = 30\text{A}$	--	8.4	9	m Ω	
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{V}, I_D = 20\text{A}$	30	--	--	S	
V_{SD}	Diode Forward Voltage	$I_S = 20\text{A}, V_{GS} = 0\text{V}$	--	--	1	V	
I_S	Maximum Body-Diode Continuous Current ^B		--	--	85	A	
DYNAMIC PARAMETERS							
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 40\text{V}, f = 1\text{MHz}$	--	5400	--	μF	
C_{oss}	Output Capacitance		--	245	--		
C_{rss}	Reverse Transfer Capacitance		--	204	--		
SWITCHING PARAMETERS							
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS} = 10\text{V}, V_{DS} = 40\text{V}, I_D = 20\text{A}$	--	92	--	nC	
Q_{gs}	Gate Source Charge		--	27	--		
Q_{gd}	Gate Drain Charge		--	21	--		
$t_{D(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{V}, V_{DS} = 40\text{V}, I_D = 20\text{A}, R_G = 2.5\Omega$	--	24	--	ns	
t_r	Turn-On Rise Time		--	19	--		
$T_{D(off)}$	Turn-Off Delay Time		--	70	--		
t_f	Turn-Off Fall Time		--	30	--		
t_{rr}	Body Diode Reverse Recovery Time	$I_F = 20\text{A}, di/dt = 100\text{A}/\mu\text{s}$	--	37	--	ns	
Q_{rr}	Body Diode Reverse Recovery Charge		--	58	--	nC	

A. Single pulse width limited by maximum junction temperature.

B. The maximum current rating is package limited.

C. The power dissipation P_D is based on $T_{J(MAX)} = 175^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

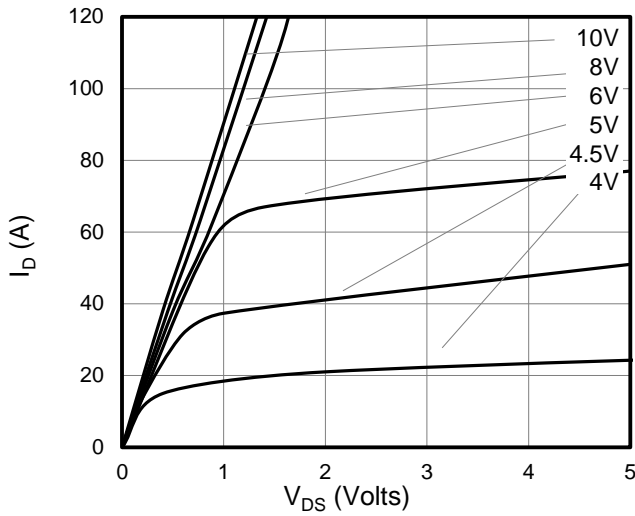


Figure 1: On-Region Characteristics

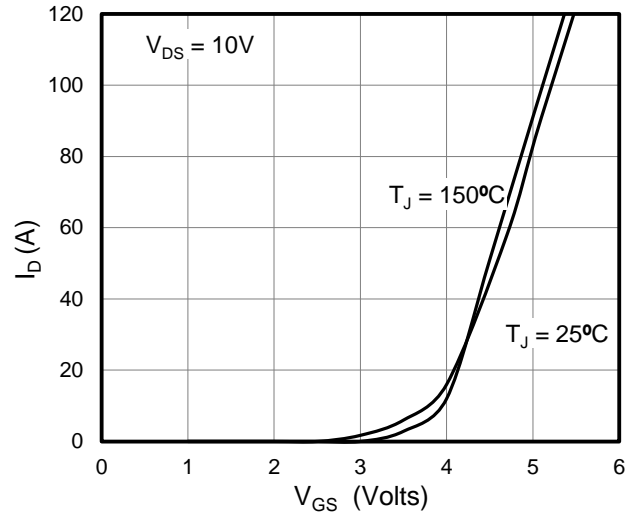


Figure 2: Transfer Characteristics

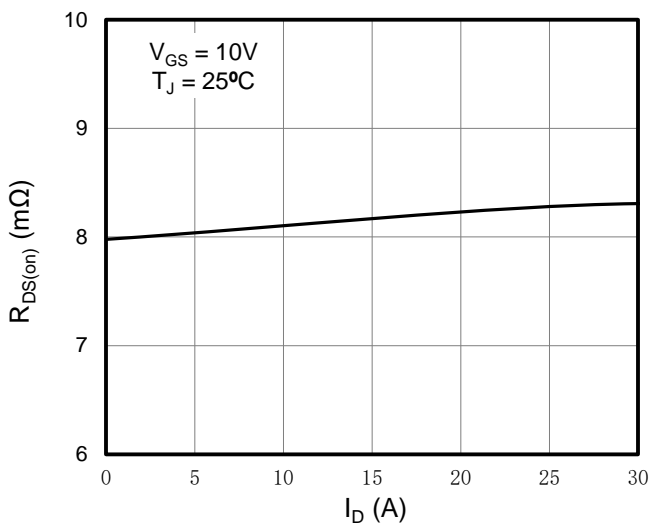


Figure 3: On-Resistance vs. Drain Current

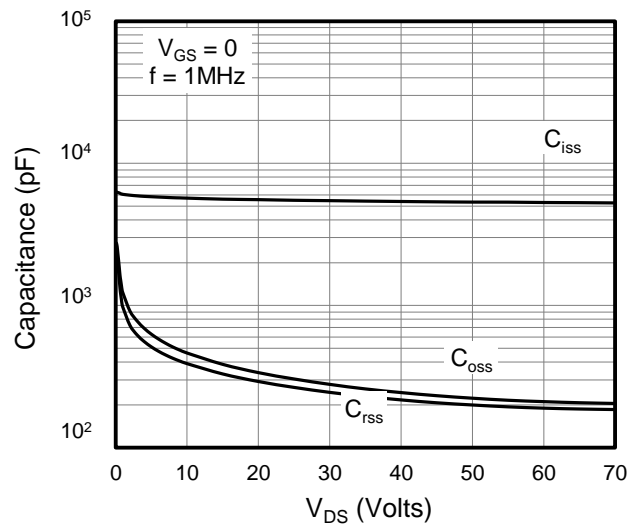


Figure 4: Capacitance Characteristics

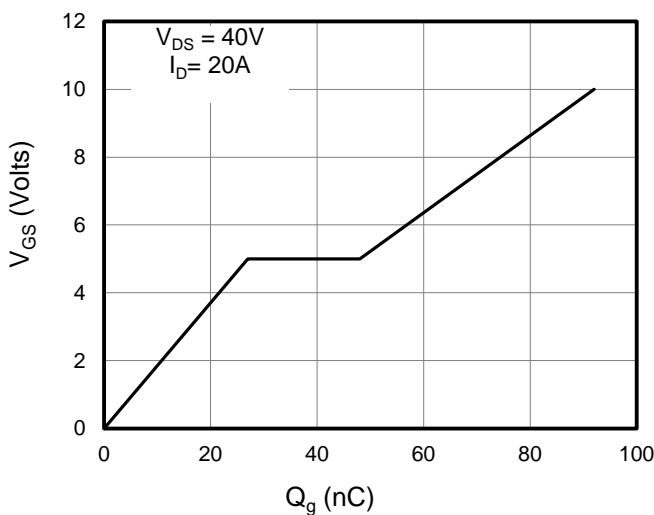


Figure 5: Gate Charge Characteristics

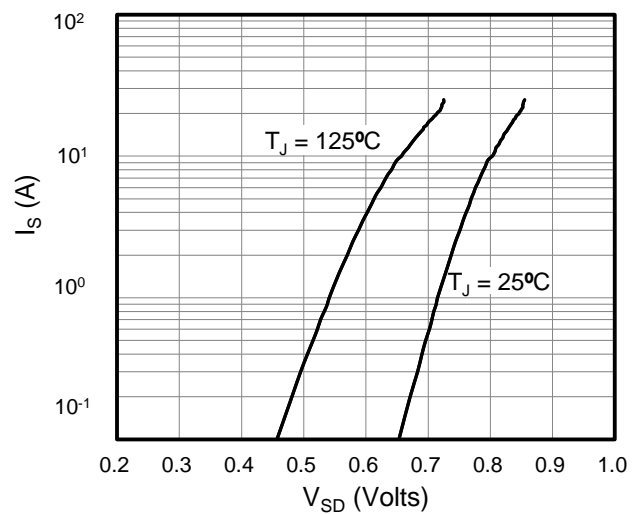


Figure 6: Body Diode Forward Voltage



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

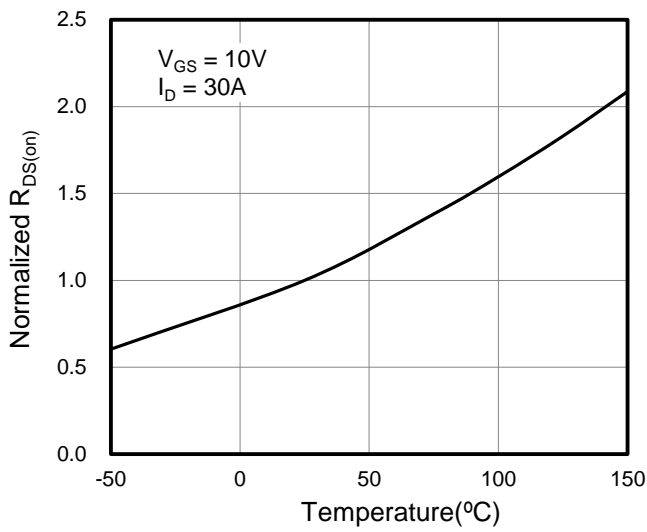


Figure 7: On-Resistance vs. Junction Temperature

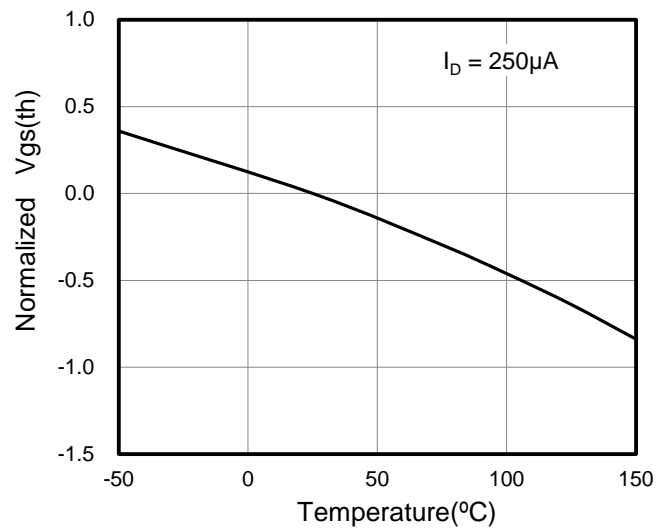


Figure 8: $V_{GS(th)}$ vs. Junction Temperature

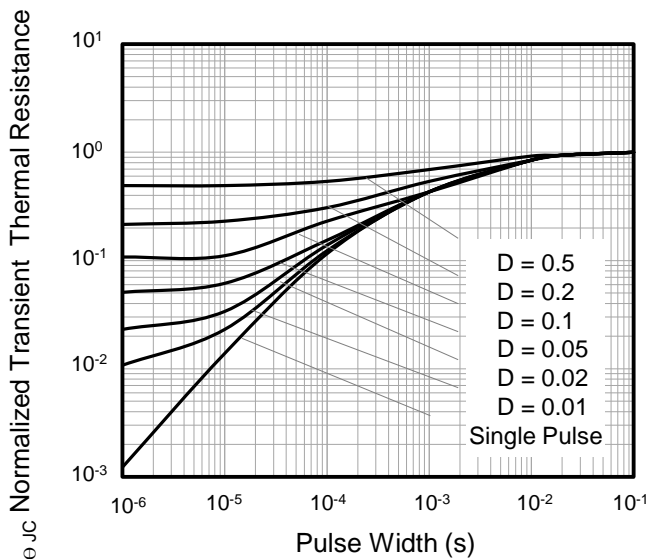


Figure 9: Normalized Transient Thermal Resistance

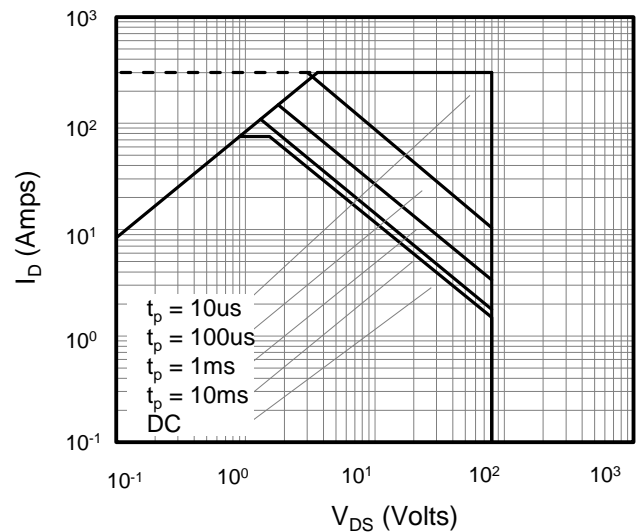


Figure 10: Safe Operating Area



Figure A: Gate Charge Test Circuit and Waveform



Figure B: Resistive Switching Test Circuit and Waveform

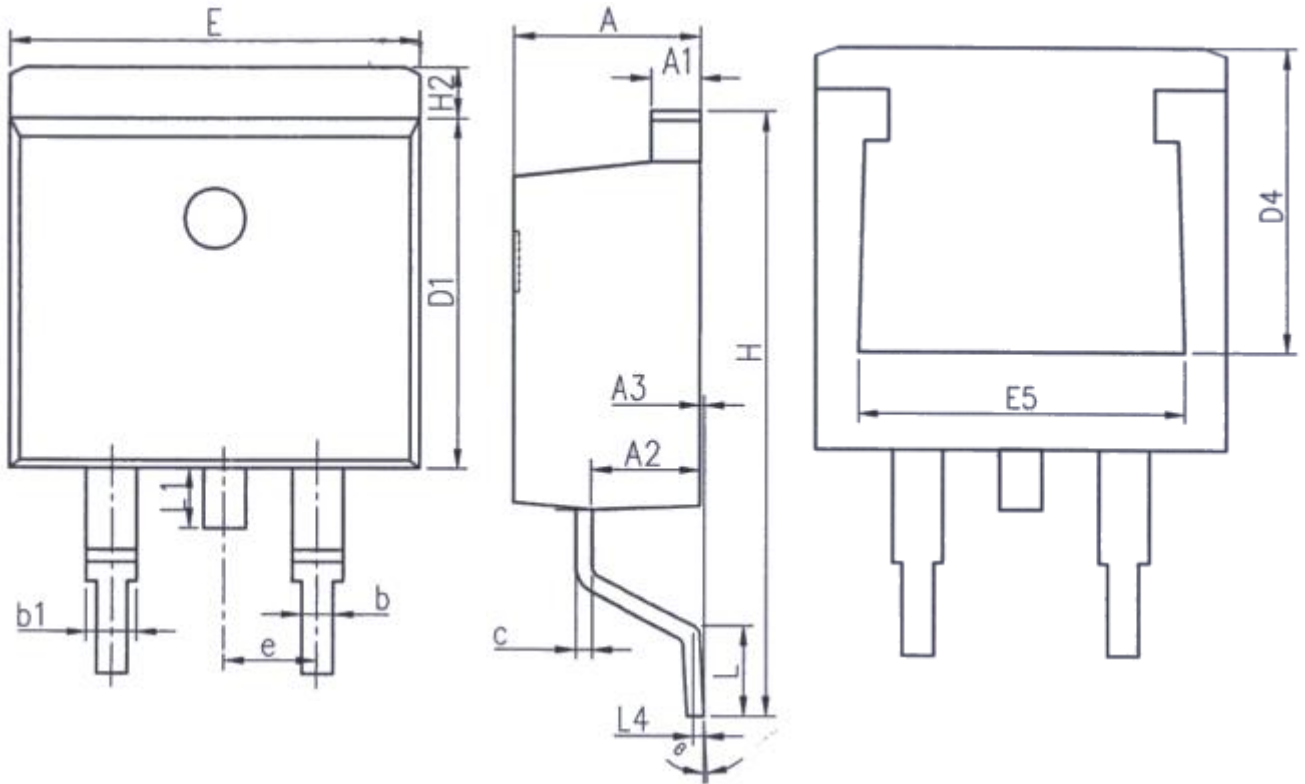


Figure C: Unclamped Inductive Switching Test Circuit and Waveform





TO-263

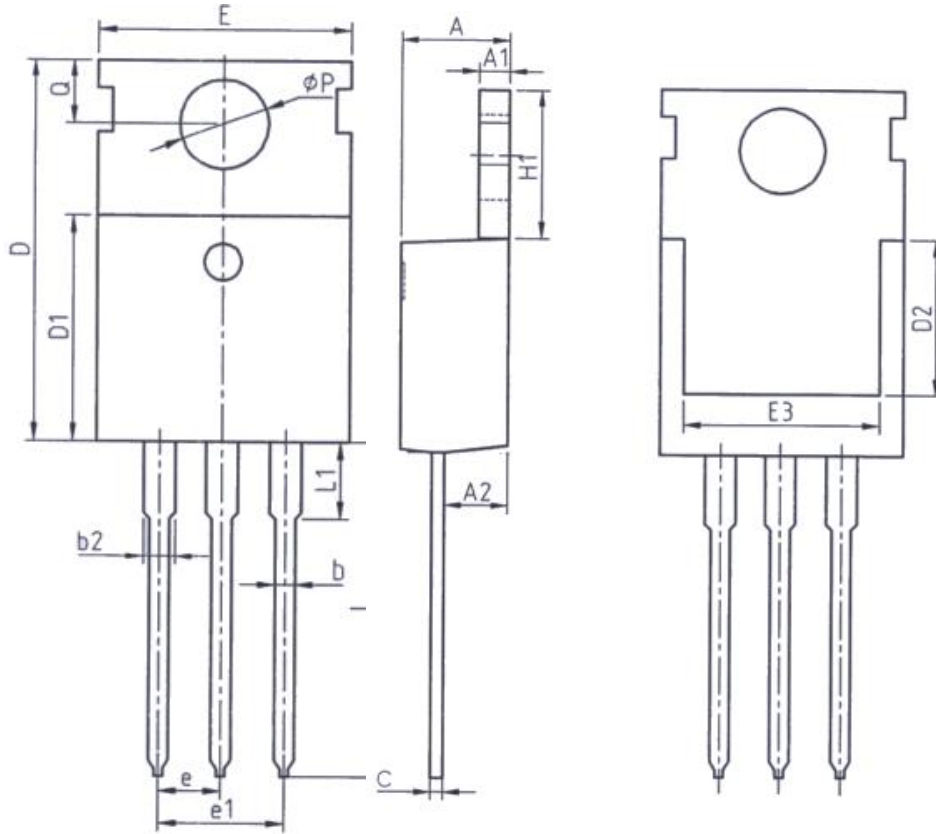


Unit: mm		
Symbol	Min.	Max.
A	4.37	4.77
A1	1.22	1.42
A2	2.49	2.89
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.30	0.53
D1	8.50	8.90
D4	6.60	-

Unit: mm		
Symbol	Min.	Max.
E	9.86	10.36
E5	7.06	-
e	2.54BSC	
H	14.70	15.50
H2	1.07	1.47
L	2.00	2.60
L1	1.40	1.70
L4	0.25BSC	
θ	0°	9°



TO-220



Unit: mm		
Symbol	Min.	Max.
A	4.37	4.77
A1	1.25	1.45
A2	2.20	2.60
b	0.70	0.95
b2	1.17	1.47
c	0.40	0.65
D	15.10	16.10
D1	8.80	9.40
D2	5.50	-

Unit: mm		
Symbol	Min.	Max.
E	9.70	10.30
E3	7.00	-
e	2.54BSC	
e1	5.08BSC	
H1	6.25	6.85
L	12.75	13.80
L1	-	3.40
P	3.40	3.80
Q	2.60	3.00



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