SHENZHEN TUOFENG SEMICONDUCTOR TECHNOLOGY CO.,LTD

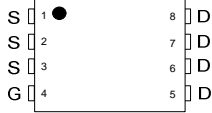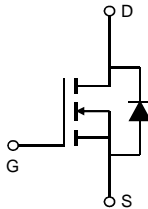# PDFN 3333 Plastic-Encapsulate MOSFETS
TF075N03M

N-Channel Enhancement Mode Power MOSFET

Features

• 30V/30A

$R_{DS (ON)}$ =7.5mΩ(Typ.)@V_{GS}=10V

$R_{DS (ON)}$ =9.3mΩ(Typ.)@V_{GS}=4.5V

• Super High Dense Cell Design
• Fast Switching Speed
• Low gate Charge
• 100% avalanche tested
• Lead Free and Green Devices Available

Applications

• Switching Application Systems

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S  1       8  D
S  2       7  D
S  3       6  D
G  4       5  D
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PDFN 3333 top view

Schematic diagram

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit

Common Ratings (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	30	A

Mounted on Large Heat Sink

Symbol	Parameter		Rating	Unit
I_{DP} [1]	300μs Pulse Drain Current Tested	T_C=25°C	100	A
I_D [2]	Continuous Drain Current@T_C(V_{GS}=10V)	T_C=25°C	30	A
	Continuous Drain Current@T_A(V_{GS}=10V) [3]	T_A=25°C	9.8	
P_D	Maximum Power Dissipation@T_C	T_C=25°C	30	W
	Maximum Power Dissipation@T_A [3]	T_A=25°C	3.8	

Notes:

①Pulse width limited by safe operating area.

②Calculated continuous current based on maximum allowable junction temperature.

③When mounted on 1 inch square copper board, t≤10sec.

④Limited by T_{Jmax}, I_{AS} =13A, V_{DD} = 24V, R_G = 50Ω, Starting T_J = 25°C.

⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.

⑥Guaranteed by design, not subject to production testing.
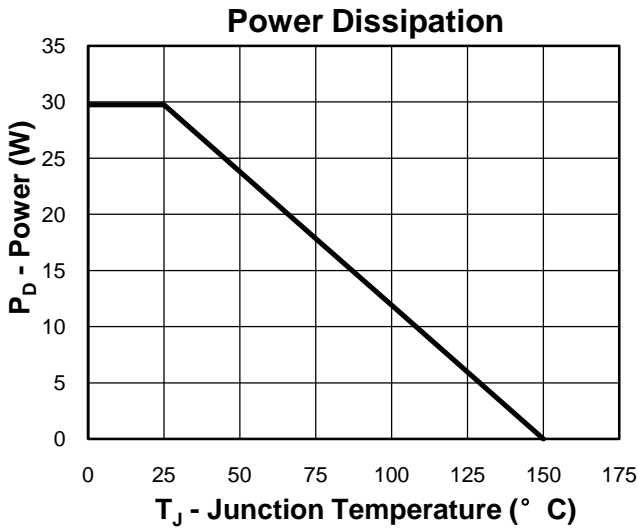
Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.5	°C/W
$R_{\theta JA}$ [3]	Thermal Resistance-Junction to Ambient	37	°C/W
Drain-Source Avalanche Ratings			
E_{AS} [4]	Avalanche Energy, Single Pulsed	30	mJ

Electrical Characteristics (T$_C$=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
BV$_{DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250µA	30			V
I$_{DSS}$	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	µA
		T$_J$=125°C			30	
V$_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250µA	1.2	1.4	2.2	V
I$_{GSS}$	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
R$_{DS(ON)}$ [5]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A		7.5	9.0	mΩ
		V_{GS}=4.5V, I_{DS}=15A		9.3	12	mΩ
Diode Characteristics						
V$_{SD}$ [5]	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V			1.2	V
t$_{rr}$	Reverse Recovery Time	I_{SD}=20A, dI$_{SD}$/dt=100A/µs		13		ns
Q$_{rr}$	Reverse Recovery Charge			8		nC
Dynamic Characteristics [6]						
R$_G$	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1		Ω
C$_{iss}$	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz		1007		pF
C$_{oss}$	Output Capacitance			128		
C$_{rss}$	Reverse Transfer Capacitance			117		
t$_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R$_L$=0.75Ω, I_{DS}=20A, V_{GEN}=10V, R$_G$=3Ω		5.7		ns
t$_r$	Turn-on Rise Time			47		
t$_{d(OFF)}$	Turn-off Delay Time			31		
t$_f$	Turn-off Fall Time			23		
Gate Charge Characteristics [6]						
Q$_g$	Total Gate Charge	V_{DS}=15V, V_{GS}=10V ,I_{DS}=20A		23		nC
Q$_{gs}$	Gate-Source Charge			4.2		
Q$_{gd}$	Gate-Drain Charge			4.3		

Typical Characteristics

Power Dissipation

Drain Current

VGS=10V

Safe Operation Area

$R_{DS(ON)}$ limited

DC

10μs
100μs
1ms
10ms

T_C=25°C

Drain Current

Ids=20A
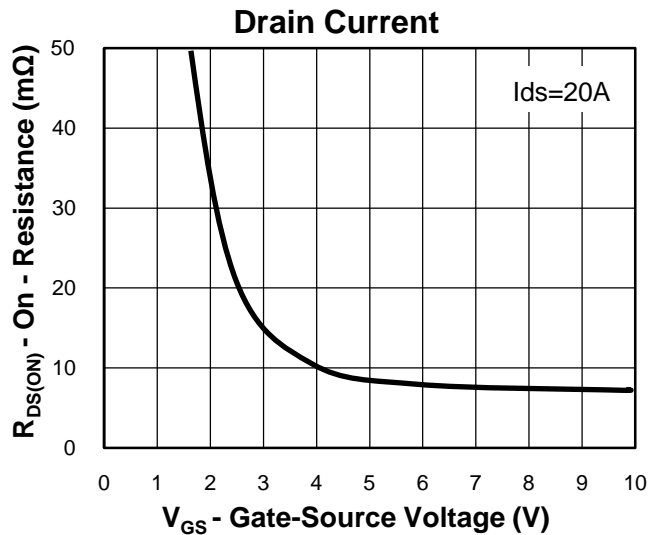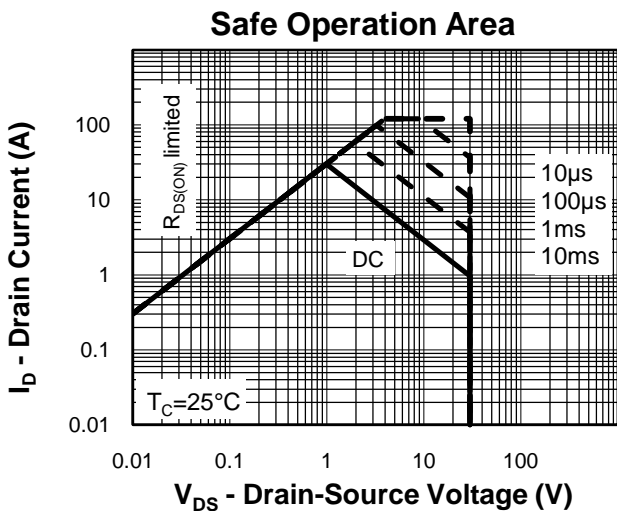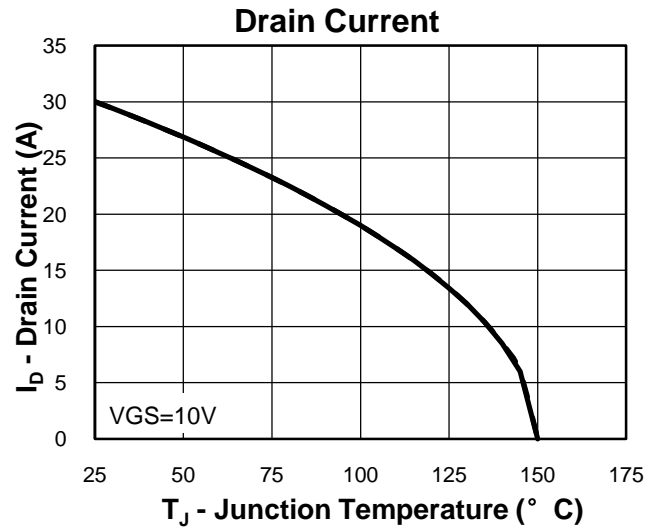
Thermal Transient Impedance

Duty=0.5, 0.2, 0.1, 0.05, 0.02, 0.01, Single Pulse

Single Pulse
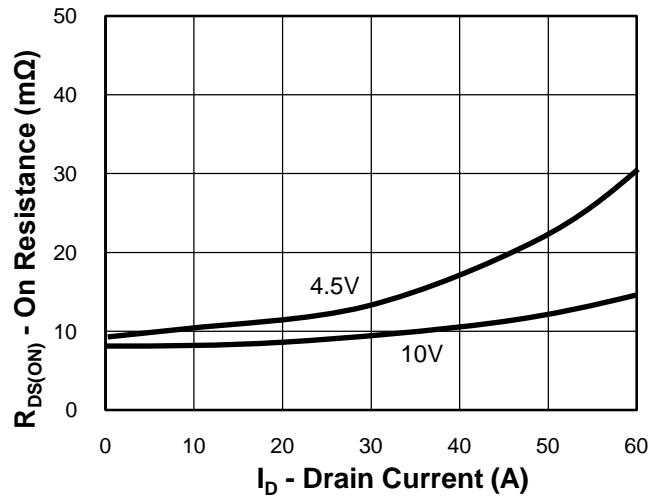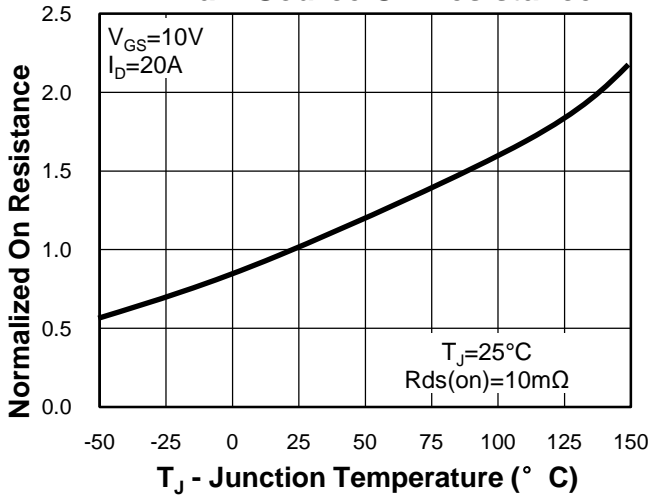
$R_{\theta JC}$=4.5°C/W
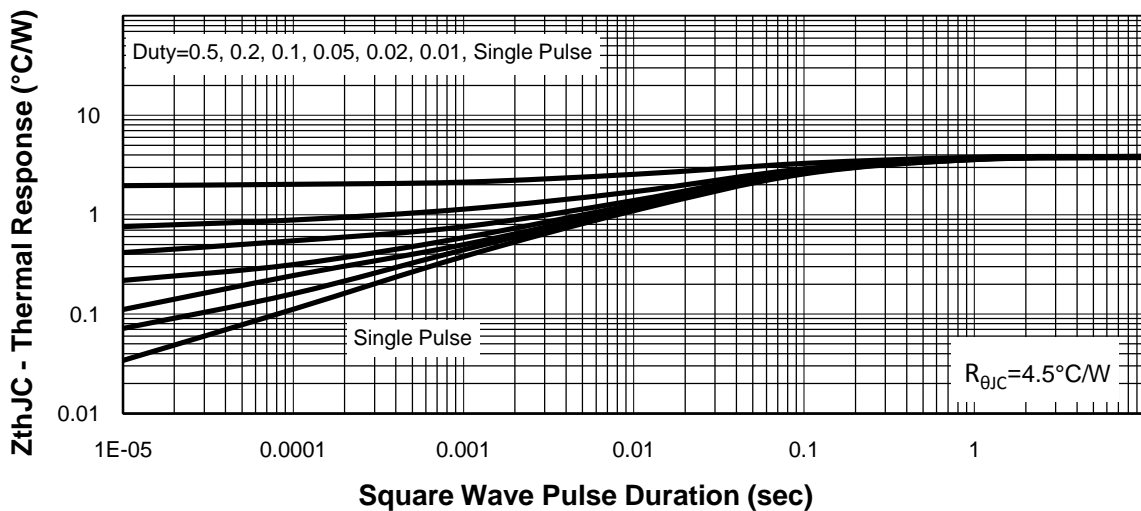
Typical Characteristics

Output Characteristics
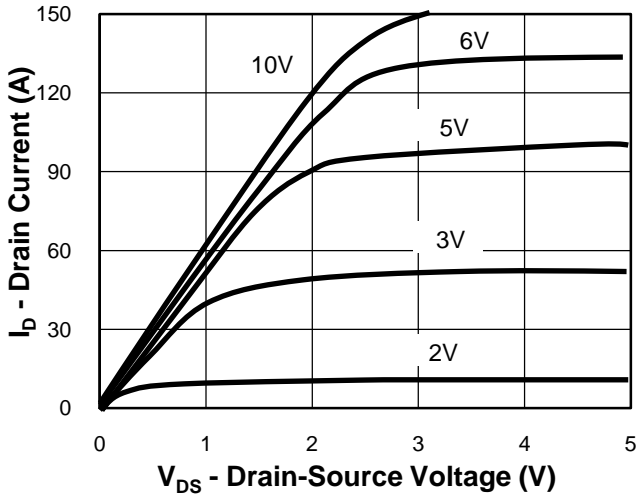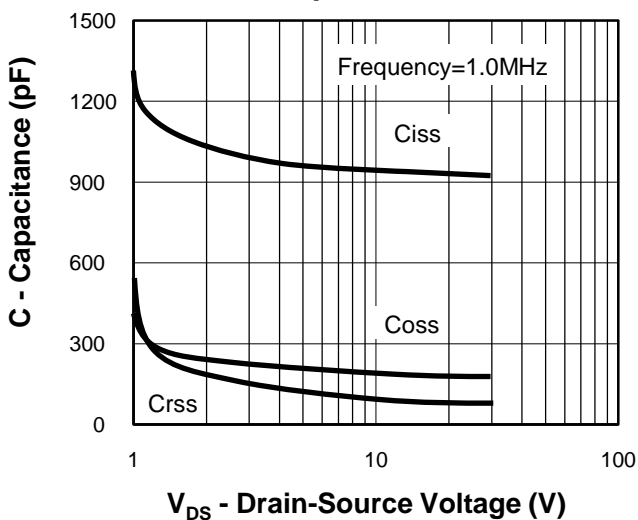

Drain-Source On Resistance
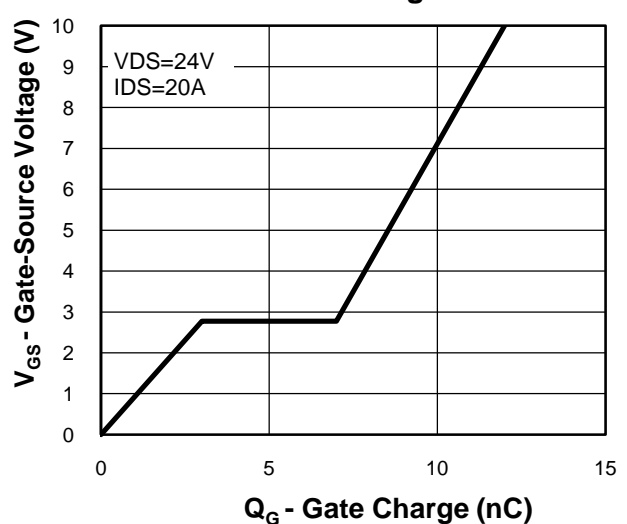

Drain-Source On Resistance
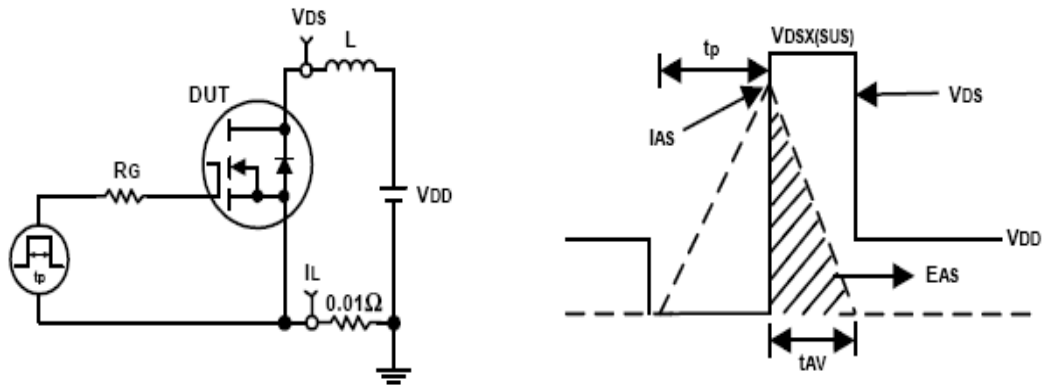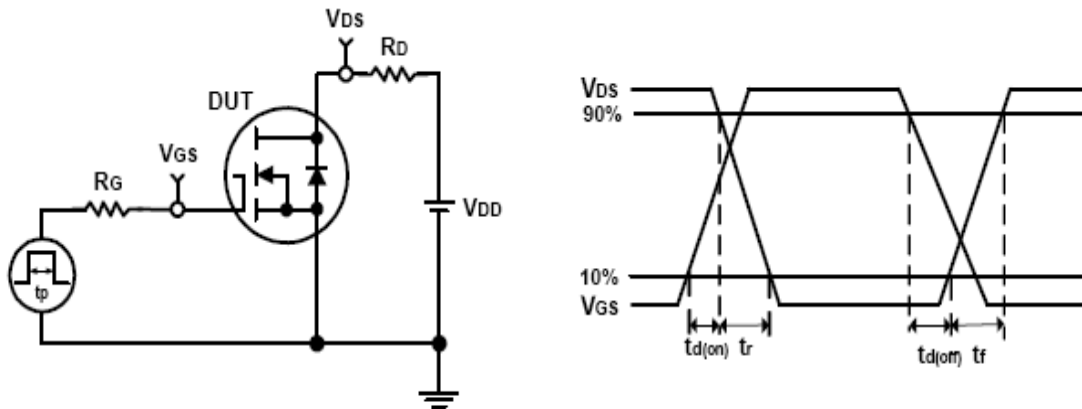

Source-Drain Diode Forward
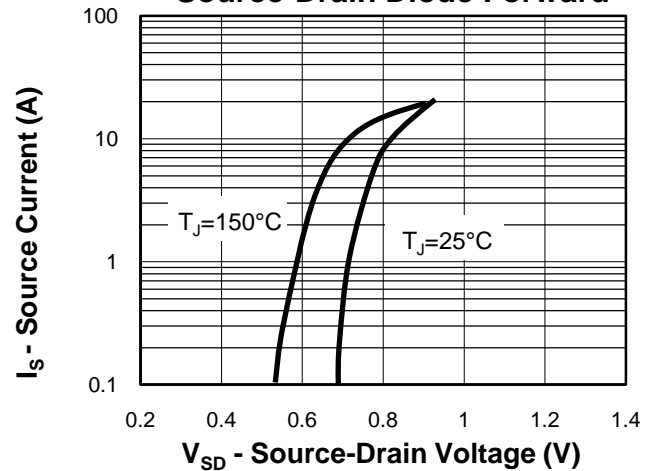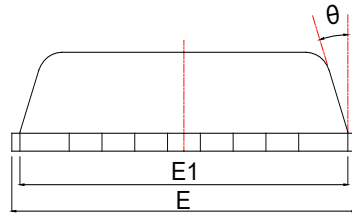

Capacitance

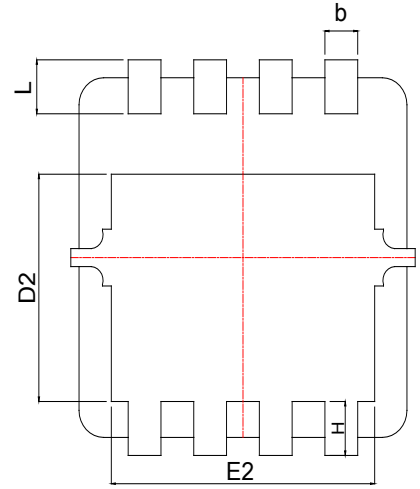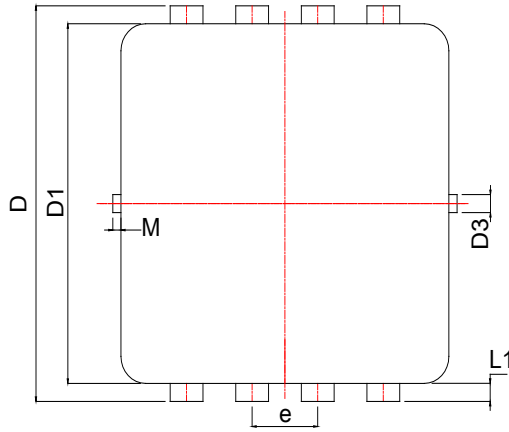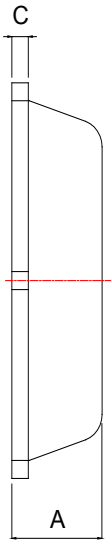**Gate Charge**

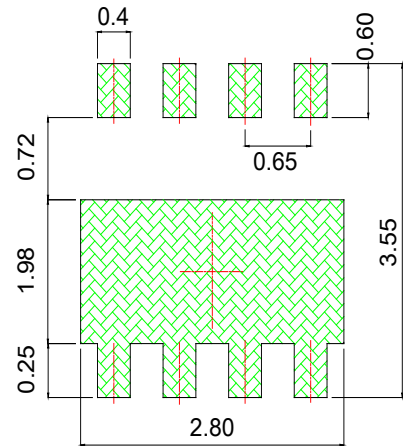## Avalanche Test Circuit and Waveforms

Switching Time Test Circuit and Waveforms

Package Information

PDFN3333

Land Pattern
(Only for Reference)

SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031	E1	3.00	3.15	3.20	0.118	0.122	0.126
b	0.25	0.30	0.35	0.010	0.012	0.014	E2	2.39	2.49	2.59	0.094	0.098	0.102
c	0.10	0.15	0.25	0.004	0.007	0.010	e	0.65BSC			0.026BSC		
D	3.25	3.35	3.45	0.128	0.132	0.136	H	0.30	0.40	0.50	0.012	0.016	0.020
D1	3.00	3.10	3.20	0.118	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	1.78	1.88	1.98	0.070	0.074	0.078	L1	*	0.13	*	*	0.005	*
D3	*	0.13	*	*	0.005	*	θ	*	10°	12°	*	10°	12°
E	3.20	3.30	3.40	0.126	0.130	0.134	M	*	*	0.15	*	*	0.006