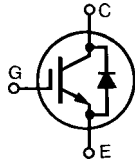


SG40T120DB

Discrete IGBTs

$$\begin{aligned}V_{CES} &= 1200V \\I_{C100} &= 40A \\V_{CEsat(typ)} &= 1.90V \\E_{off(typ)} &= 1.4mJ\end{aligned}$$



G=Gate栅极
C=Collector集电极
E=Emitter发射极
TAB底板=Collector集电极
其中SG40T120DB4 是绝缘式的

IGBT

Symbol	Test Conditions	Maximum Ratings	Unit
V_{CES} V_{CGR}	$T_J=25^{\circ}C$ to $150^{\circ}C$ $T_J=25^{\circ}C$ to $150^{\circ}C$; $R_{GE}=1\text{ M}\Omega$;	1200 1200	V
V_{GES} V_{GEM}	Continuous Transient	± 20 ± 30	V
I_{C25} I_{C100} I_{CM}	$T_C=25^{\circ}C$; limited by leads $T_C=100^{\circ}C$ $T_C=25^{\circ}C$, 1 ms	80 40 160	A
SSOA (RBSOA)	$V_{GE}=15V$; $T_{VJ}=125^{\circ}C$; $R_G=5\text{ }\Omega$ Clamped inductive load	$I_{CM}=120$ @ $0.8 V_{CES}$	A
P_c	$T_C=25^{\circ}C$	280	W
T_J T_{JM} T_{stg}		-55...+175 175 -55...+150	$^{\circ}C$
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10s Maximum Tab temperature for soldering SMD devices for 10s	300 260	$^{\circ}C$ $^{\circ}C$
M_d	Mounting torque (M3)	1.13/10	Nm/lb.in.
Weight	Typical	6	g

($T_J=25^{\circ}C$, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
BV_{CES}	$I_C=1mA$; $V_{GE}=0V$	1200			V
$V_{GE(th)}$	$I_C=250\mu A$; $V_{CE}=V_{GE}$	4.5	5.8	7.0	V
I_{CES}	$V_{CE}=V_{CES}$; $T_J=25^{\circ}C$ $V_{GE}=0V$; $T_J=125^{\circ}C$			250 4	μA mA
I_{GES}	$V_{CE}=0V$; $V_{GE}=\pm 20V$			± 200	nA
$V_{CE(sat)}$	$I_C=I_{C100}$; $V_{GE}=15V$		1.90	2.40	V

Sirectifier®

SG40T120DB

Discrete IGBTs

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
g _{ts}	I _C =I _{C90} ; V _{CE} =10V Pulse test, t ≤ 300μs, duty cycle ≤ 2%		33		S
I _{C(ON)}	V _{GE} =10V; V _{CE} =10V		140		A
C _{ies} C _{oes} C _{res}	V _{CE} =25V; V _{GE} =0V; f=1MHz		3823 170 94		pF
Q _g Q _{ge} Q _{gc}	I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES}		230 30 147		nC
t _{d(on)} t _{ri} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =25°C I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES} ; R _G =R _{off} =10Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8V _{CES} higher T _J or increased R _G		62 54 260 30 1.4		ns ns ns ns mJ
t _{d(on)} t _{ri} E _{on} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =150°C I _C =I _{C100} ; V _{GE} =15V; V _{CE} =0.5V _{CES} ; R _G =R _{off} =10Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8V _{CES} higher T _J or increased R _G		55 54 3.5 300 38 1.85		ns ns mJ ns ns mJ
R _{thJC} (IGBT)				0.45	°C/W
R _{thJA} (IGBT)				40	°C/W

Reverse Diode (FRED)

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
V _F	I _F =15A; T _{VJ} =25°C I _F = 60A; T _{VJ} =25°C		1.58 2.15	1.70	V
I _{RM}	V _R =100V; I _F =20A; -di _F /dt=100A/μs L ≤ 0.05μH; T _{VJ} =100°C		5.4		A
t _{rr}	I _F =1A; -di _F /dt=50A/μs; V _R =30V; T _J =25°C		70		ns
R _{thJC}	Diode			0.80	K/W

Sirectifier®

SG40T120DB

Discrete IGBTs

Features

- Infineon Gen7 Trench Field Stop IGBT technology
- Low switching losses
- Switching frequency up to 30KHz
- High short circuit capability
- Positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- Ultra fast free wheeling diodes

Application

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverter

Advantages

- space and weight savings
- reduced protection circuits

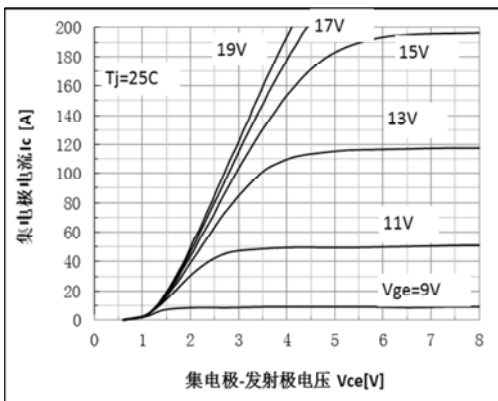


图 1 输出特性曲线

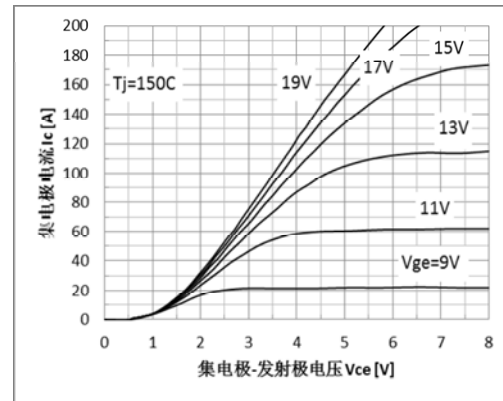


图 2 输出特性曲线

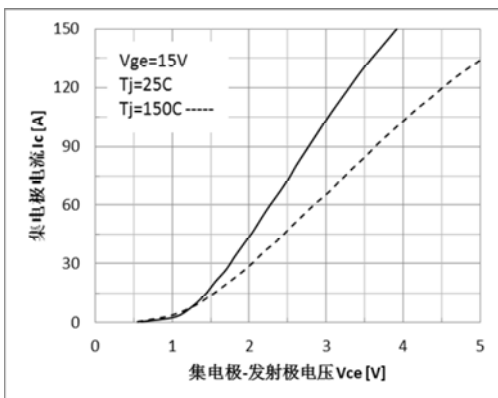


图 3 饱和压降特性

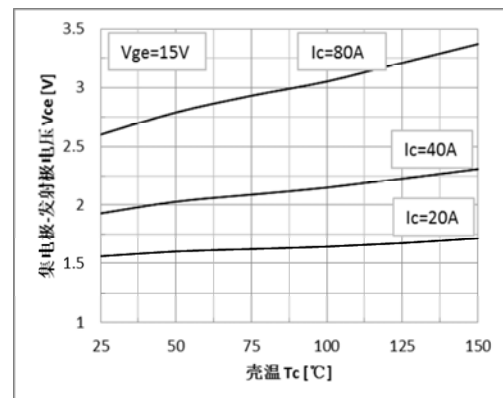


图 4 饱和压降温度特性

SG40T120DB

Discrete IGBTs

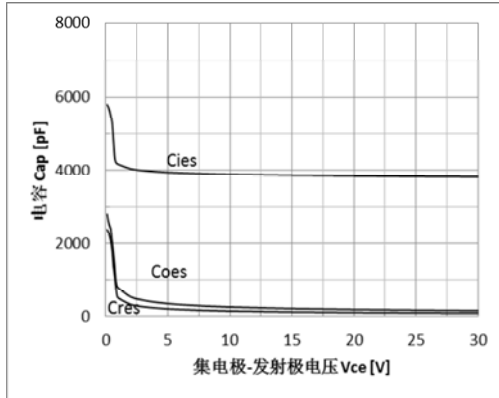


图 5 电容特性

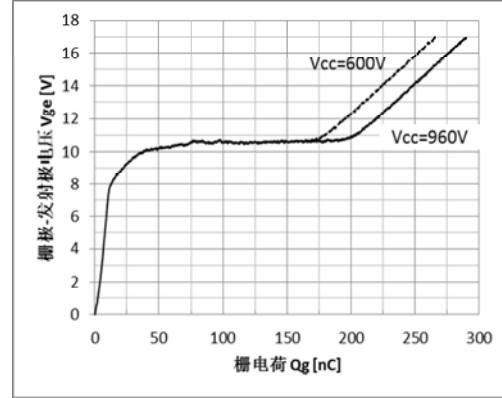


图 6 栅电荷特性

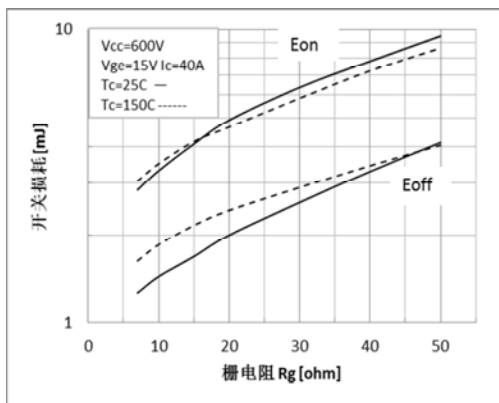


图 7 开关损耗-栅电阻特性曲线

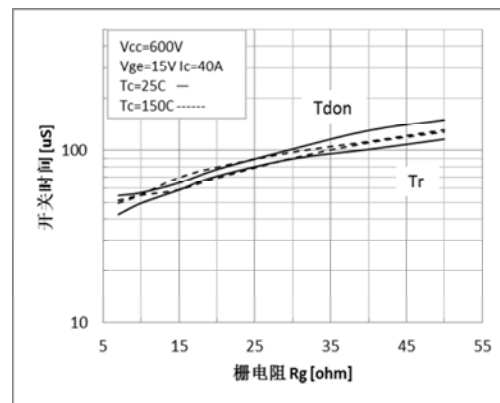


图 8 开通-栅电阻特性曲线

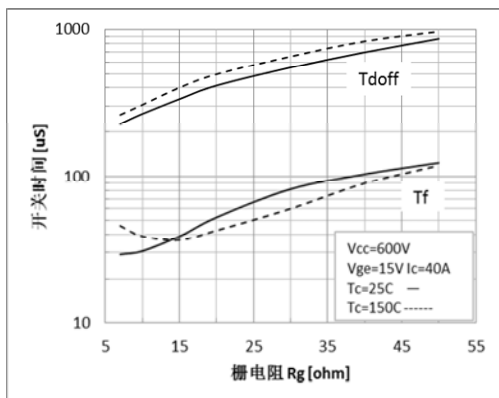


图 9 关断-栅电阻特性曲线

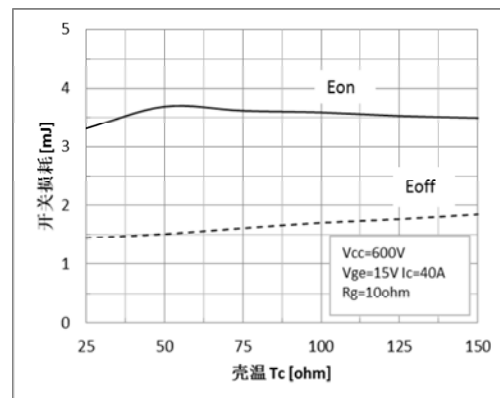


图 10 开关损耗温度特性

SG40T120DB

Discrete IGBTs

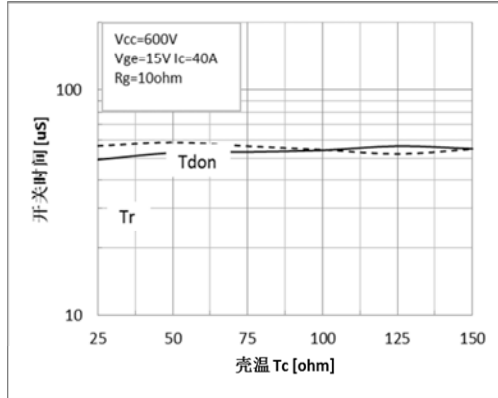


图 11 开通温度特性

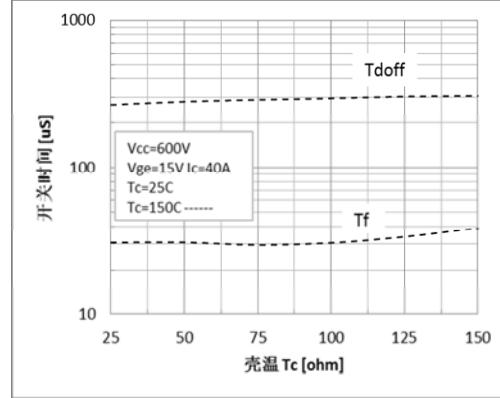


图 12 关断温度特性

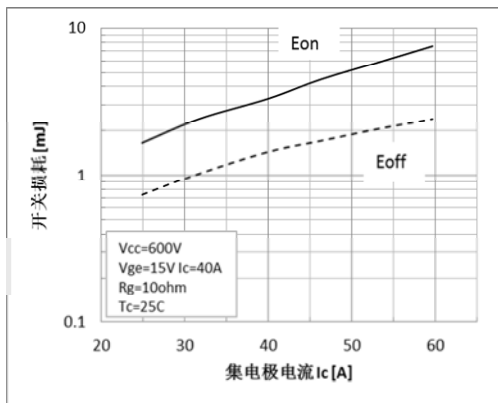


图 13 开关损耗与电流特性

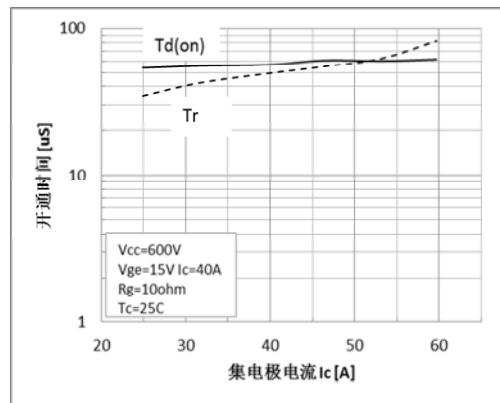


图 14 开通与电流特性

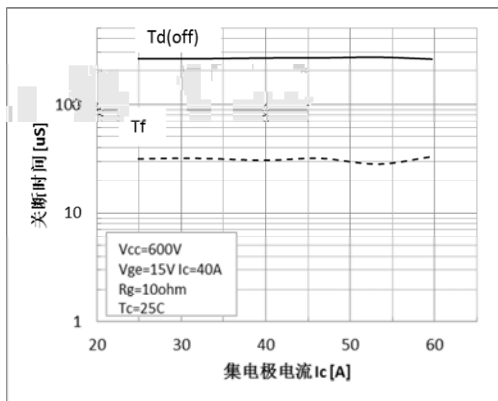


图 15 关断与电流特性

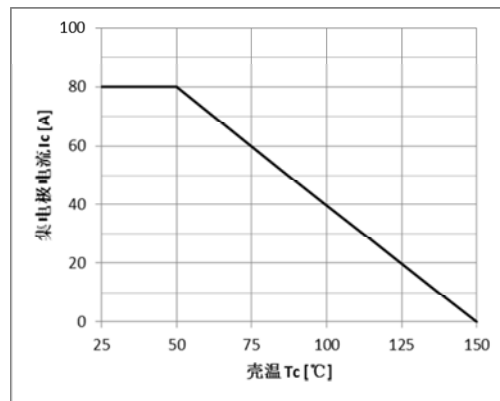


图 16 集电极电流温度特性

SG40T120DB

Discrete IGBTs

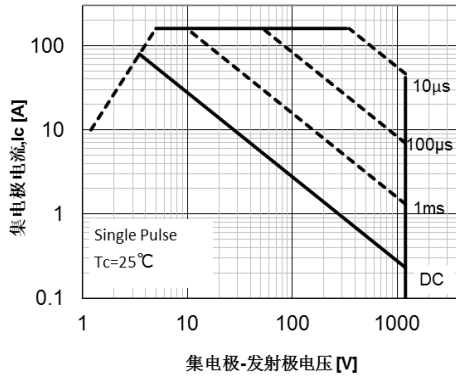


图 17 正向安全工作区

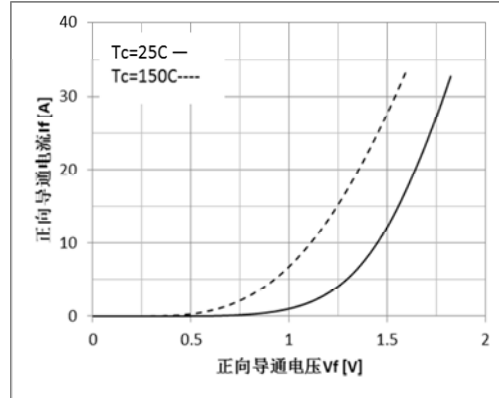


图 18 二极管正向特性

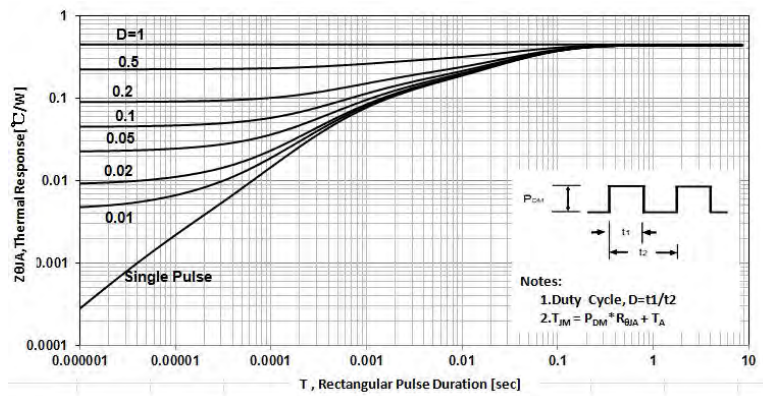


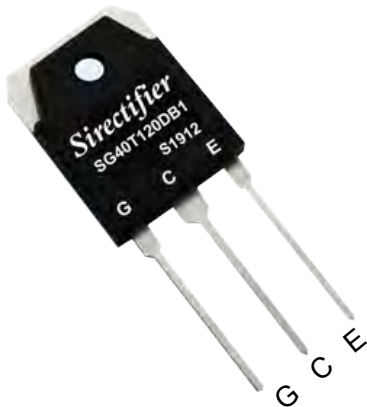
图 19 瞬态热阻特性

SG40T120DB

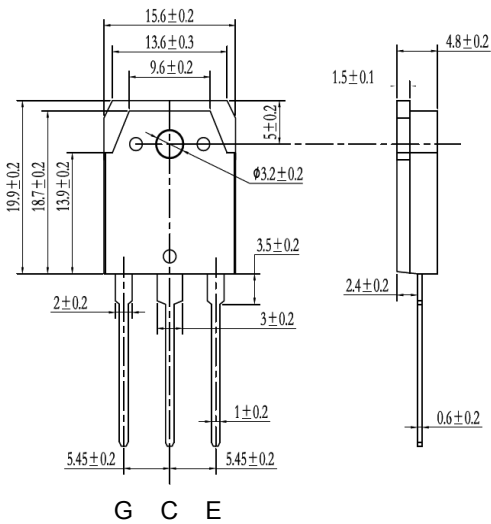
Discrete IGBTs

Dimensions

TO-3P



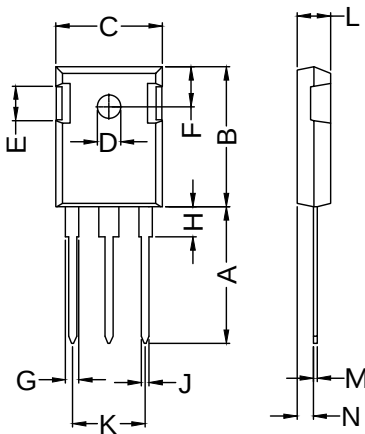
SG40T120DB1 (封装外形 TO-3P)



TO-247AD



SG40T120DB2 (封装外形TO-247AD)

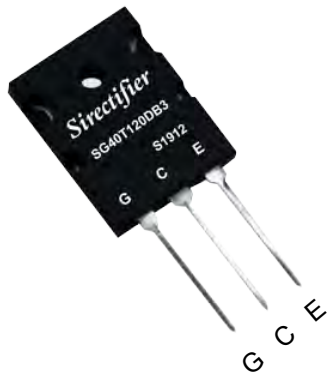


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.620	0.640
ØD	3.15	3.65	0.124	0.144
E	4.32	5.49	0.170	0.216
F	5.40	6.30	0.213	0.248
G	1.65	2.18	0.065	0.086
H	3.80	4.50	0.150	0.177
J	1.00	1.40	0.039	0.055
K	10.80	11.10	0.425	0.437
L	4.70	5.30	0.185	0.209
M	0.40	0.80	0.016	0.031
N	1.50	2.49	0.059	0.098

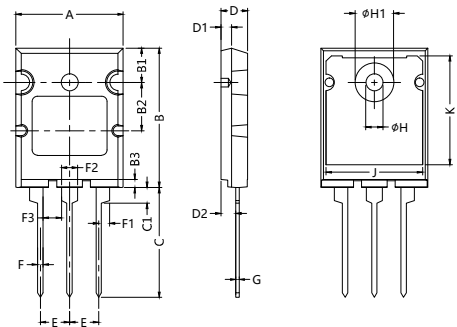
SG40T120DB

Discrete IGBTs

TO-264

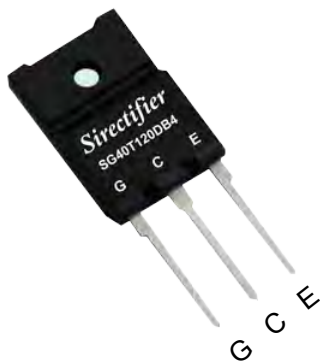


SG40T120DB3 (封装外形TO-264)

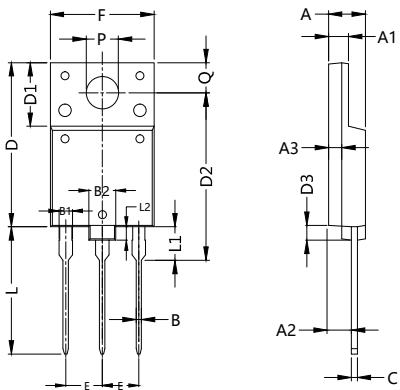


Dim.	Millimeter		Dim.	Millimeter	
	Min.	Max.		Min.	Max.
A	19.50	20.50	E	5.45TYP	
B	25.70	26.30	F	0.90	1.25
B1	5.80	6.20	F1	2.30	2.75
B2	8.80	9.20	F2	2.80	3.20
B3	1.35REF		F3	2.40	/
C	19.50	20.50	G	0.50	0.85
C1	2.20	2.70	H	3.20	3.60
D	4.80	5.20	H1	6.50	7.50
D1	2.00REF		J	16.00	/
D2	2.50	3.10	K	19.00	/

TO-3PF



SG40T120DB4 (封装外形绝缘式TO-3PF)



Dim.	Millimeter		Dim.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.30	5.70	D2	24.50	25.30
A1	2.80	3.25	D3	3.30	3.70
A2	3.10	3.70	E	5.35	5.55
A3	1.80	2.20	F	15.30	15.70
B	0.65	0.95	L	18.50	19.50
B1	1.90	2.15	L1	4.50	5.20
B2	3.80	4.50	L2	1.90	2.20
C	0.70	1.10	P	3.40	3.80
D	24.30	24.70	Q	4.30	4.70
D1	9.80	10.25			