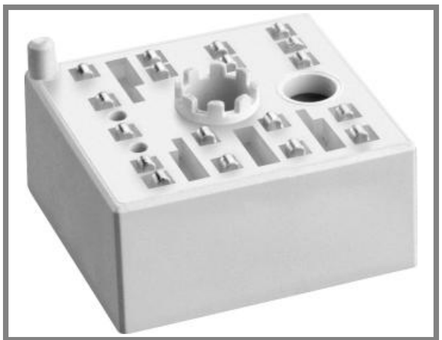


MiniSKiiP® 0

1-phase bridge rectifier + 3-phase bridge inverter

SKiiP 01NEC066V3

Features

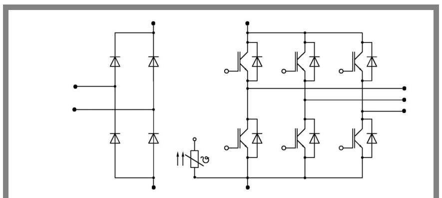
- Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*

- Inverter up to 3,5 kVA
- Typical motor power 1,5 kW

Remarks

- Case temperature limited to T_C = 125°C max.
- Product reliability results are valid for T_j = 150°C
- SC data: $t_p \le$ 6 µs; $V_{GE} \le$ 15 V; T_j = 150°C; V_{CC} = 360 V
- V_{CEsat}, V_F = chip level value



NEC

Absolute Maximum Ratings	T_s = 25 °C, unless otherwise specified		
Symbol	**Conditions**	**Values**	**Units**
IGBT - Inverter			
V_{CES}		600	V
I_C	T_s = 25 (70) °C, T_j = 150 °C	12 (11)	A
I_C	T_s = 25 (70) °C, T_j = 175 °C	12 (12)	A
I_{CRM}	t_p = 1 ms	12	A
V_{GES}		± 20	V
Diode - Inverter			
I_F	T_s = 25 (70) °C, T_j = 150 °C	12 (12)	A
I_F	T_s = 25 (70) °C, T_j = 175 °C	12 (12)	A
I_{FRM}	t_p = 1 ms	12	A
Diode - Rectifier			
V_{RRM}		800	V
I_F	T_s = 70 °C	35	A
I_{FSM}	t_p = 10 ms, sin 180 °, T_j = 25 °C	220	A
i²t	t_p = 10 ms, sin 180 °, T_j = 25 °C	240	A²s
I_{tRMS}	per power terminal (20 A / spring)	20	A
T_j	IGBT, Diode	-40...+175	°C
T_{stg}		-40...+125	°C
V_{isol}	AC, 1 min.	2500	V

Characteristics	T_s = 25 °C, unless otherwise specified				
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT - Inverter					
$V_{CE(sat)}$	I_{Cnom} = 6 A, T_j = 25 (150) °C	1,1	1,45 (1,65)	1,85 (2,05)	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 1 mA		5,8		V
$V_{CE(TO)}$	T_j = 25 (150) °C		0,9 (0,7)	1,1 (1)	V
r_{CE}	T_j = 25 (150) °C		100 (167)	134 (184)	mΩ
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,45		nF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,1		nF
C_{res}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,05		nF
$R_{CC'+EE'}$	spring contact-chip T_s = 25 (150)°C				mΩ
$R_{th(j-s)}$	per IGBT		2,4		K/W
$t_{d(on)}$	under following conditions		20		ns
t_r	V_{CC} = 300 V, V_{GE} = -8V/+15V		25		ns
$t_{d(off)}$	I_{Cnom} = 6 A, T_j = 150 °C		175		ns
t_f	R_{Gon} = R_{Goff} = 47 Ω		60		ns
E_{on} (E_{off})	inductive load		0,3 (0,2)		mJ
Diode - Inverter					
V_F = V_{EC}	I_F = 6 A, T_j = 25 (150) °C		1,3 (1,3)	1,6 (1,6)	V
$V_{(TO)}$	T_j = 25 (150) °C		0,9 (0,8)	1 (0,9)	V
r_T	T_j = 25 (150) °C		67 (83)	100 (117)	mΩ
$R_{th(j-s)}$	per diode		3		K/W
I_{RRM}	under following conditions		11,2		A
Q_{rr}	I_{Fnom} = 6 A, V_R = 300 V		0,9		µC
E_{rr}	V_{GE} = 0 V, T_j = 150°C		0,2		mJ
	di_F/dt = 520 A/µs				
Diode - Rectifier					
V_F	I_{Fnom} = 15 A, T_j = 25 °C		1,1		V
$V_{(TO)}$	T_j = 150 °C		0,8		V
r_T	T_j = 150 °C		20		mΩ
$R_{th(j-s)}$	per diode		1,5		K/W
Temperature Sensor					
R_{ts}	3 %, T_r = 25 (100) °C		1000(1670)		Ω
Mechanical Data					
w			21,5		g
M_s	Mounting torque	2		2,5	Nm

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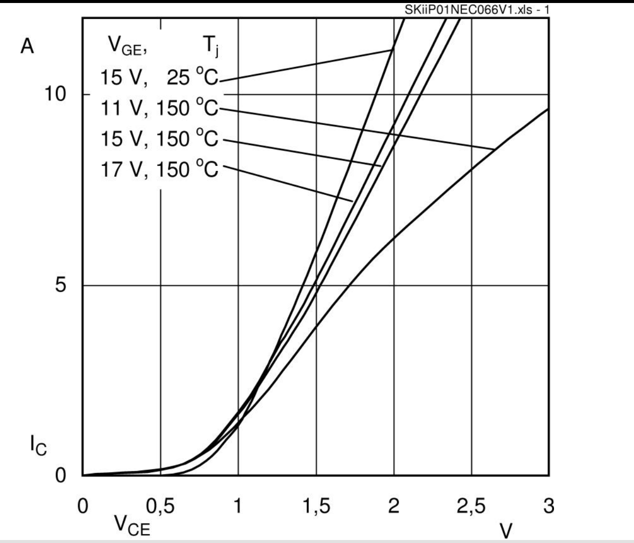

Fig. 1 Typ. output characteristic

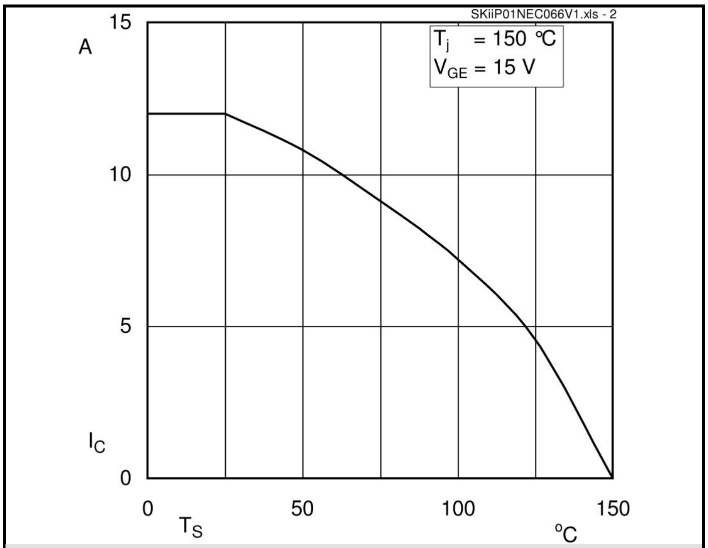

Fig. 2 Typ. rated current vs. temperature

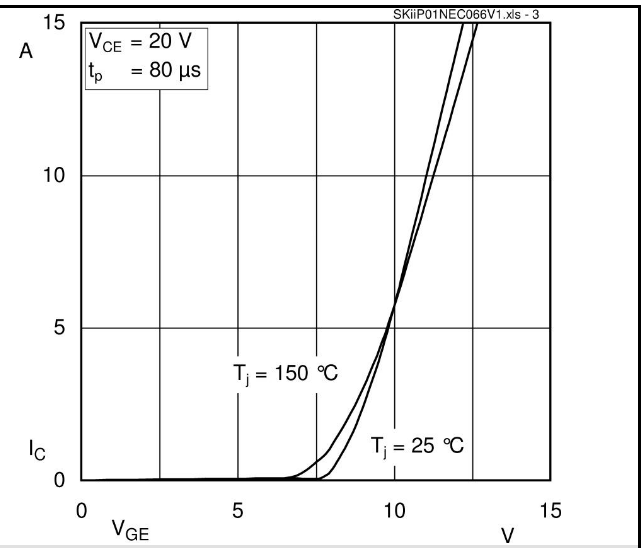

Fig. 3 Typ. transfer characteristic

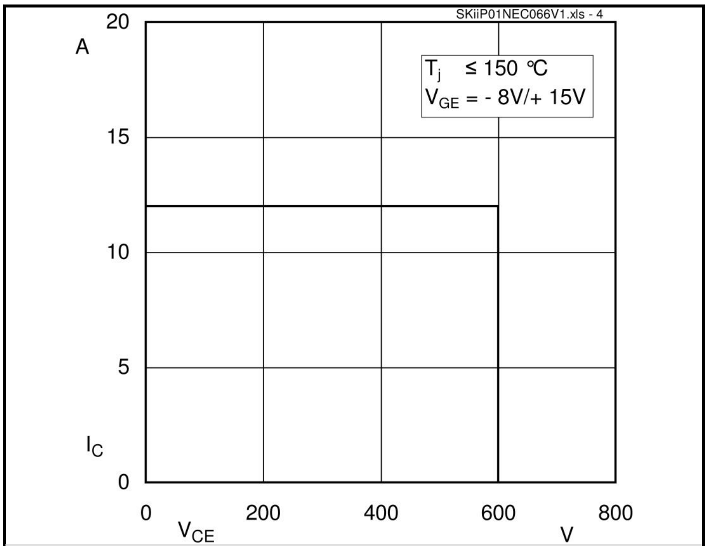

Fig. 4 Reverse bias safe operating area

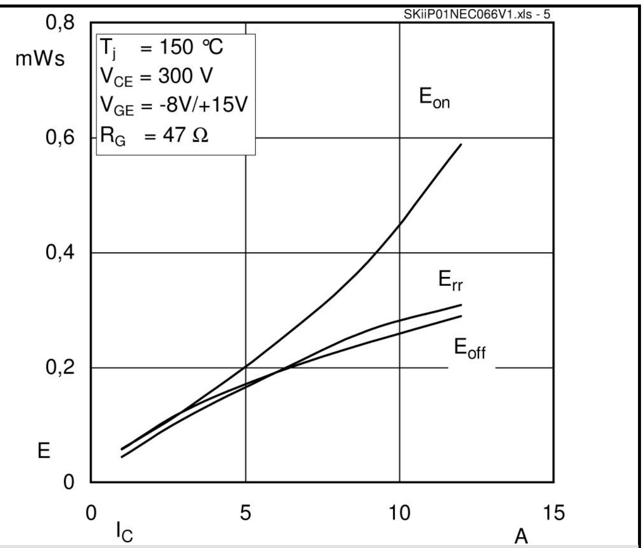

Fig. 5 Typ. Turn-on /-off energy = f (I_C)

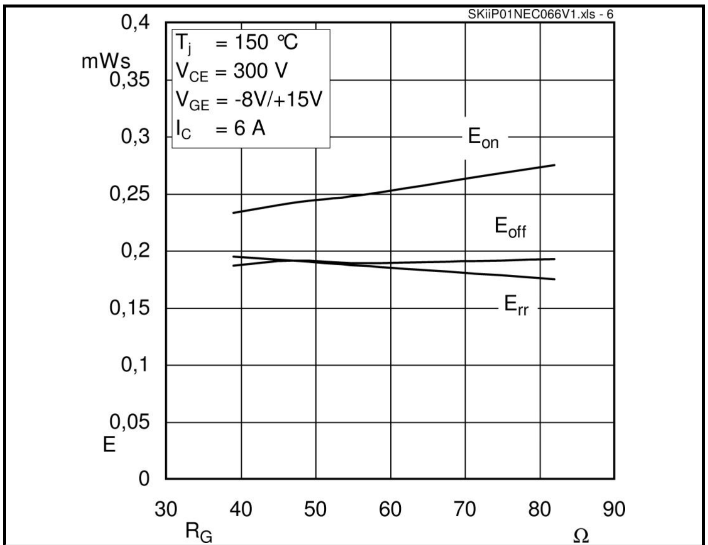

Fig. 6 Typ. Turn-on /-off energy = f (R_G)

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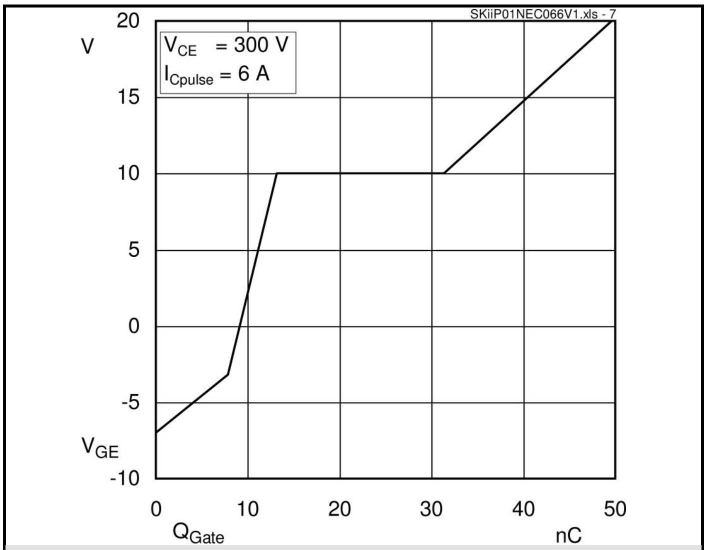

Fig. 7 Typ. gate charge characteristic

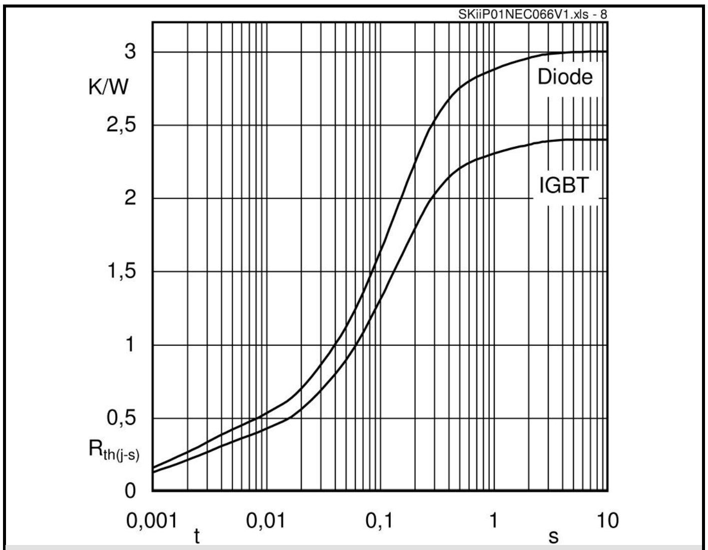

Fig. 8 Typ. thermal impedance

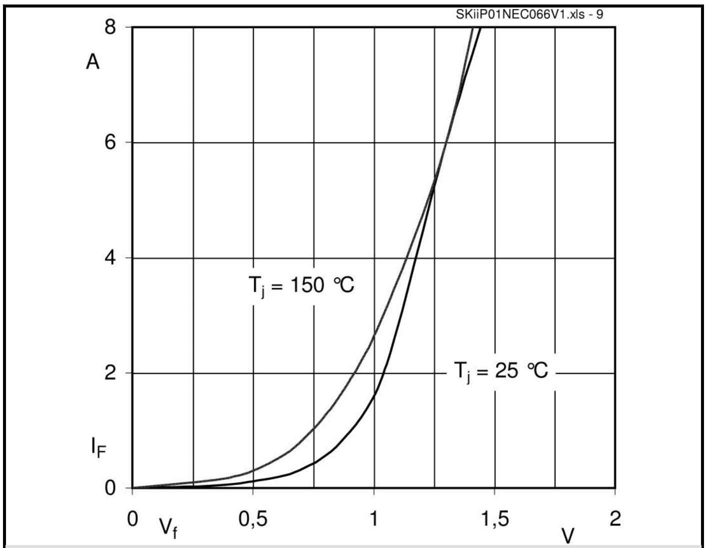

Fig. 9 Typ. freewheeling diode forward characteristic

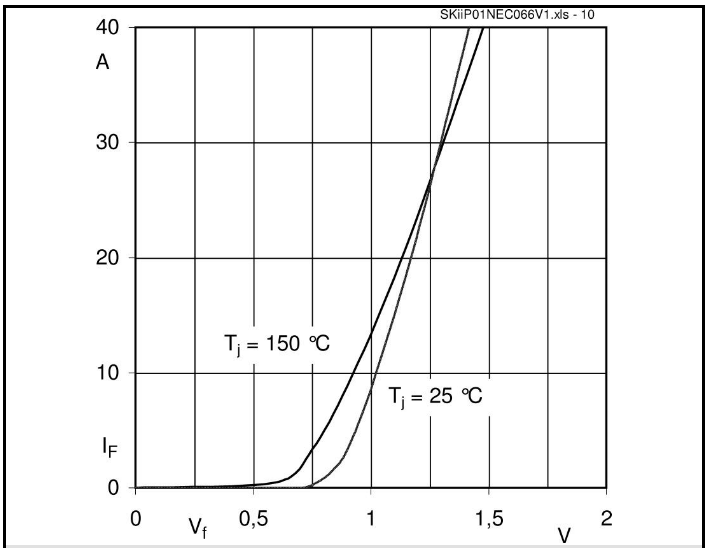

Fig. 10 Typ. input bridge forward characteristic

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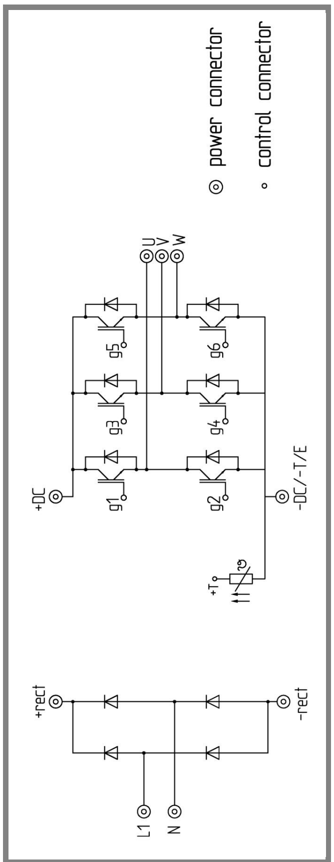
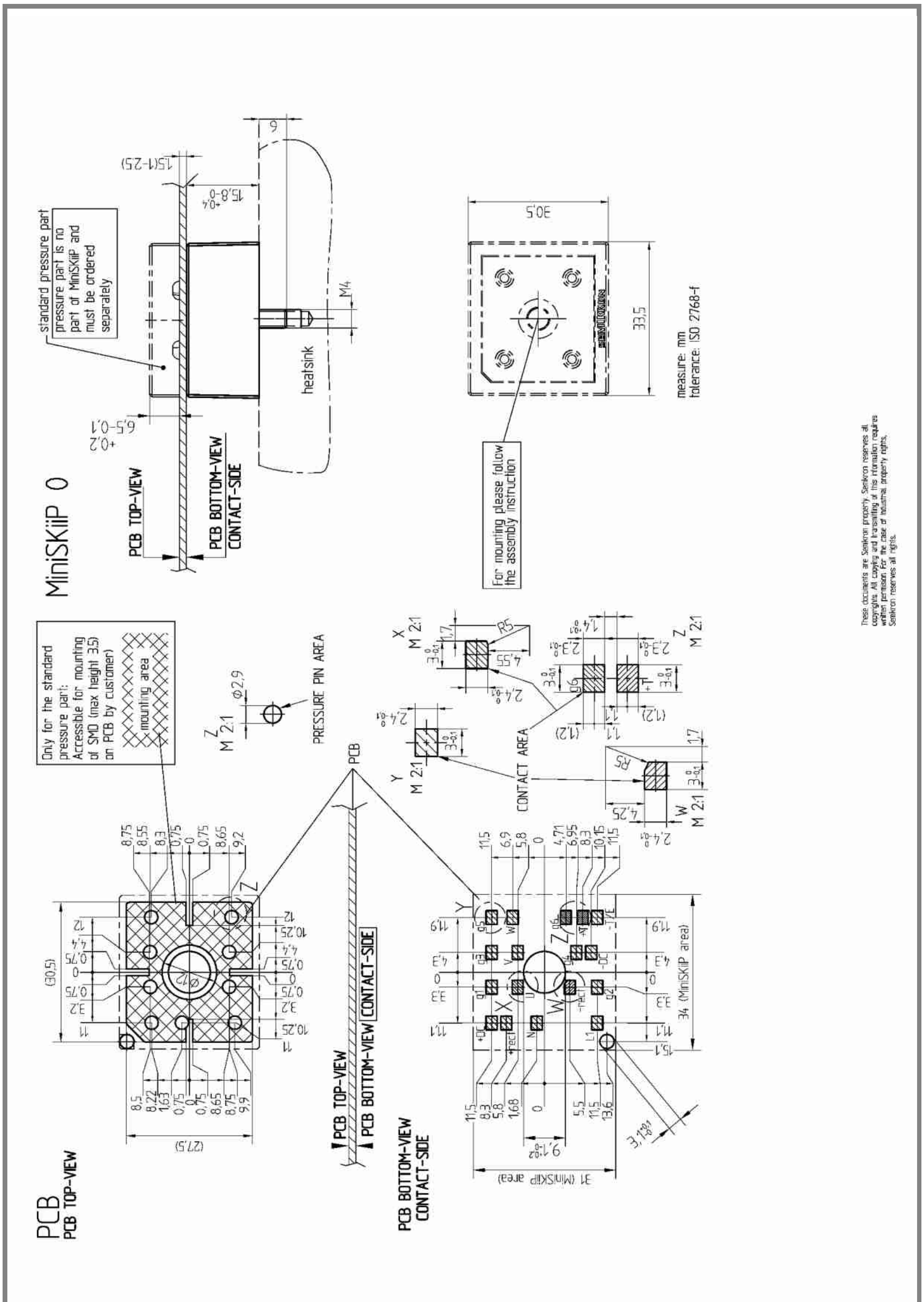


circuit



pinout, dimensions

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.