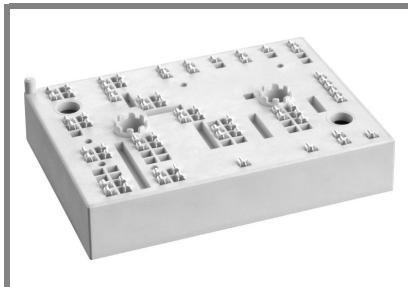


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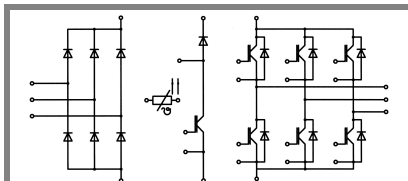
3-phase bridge rectifier +
brake chopper + 3-phase
bridge inverter
SKiIP 38NAB12T4V1

Features

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

Remarks

- V_{CEsat} , V_F = chip level value
- For short circuit: Soft R_{Goff} recommended $R_{Goff} > 6,2 \Omega$
- I_C limited by chip size to $I_C = 115$ A



NAB

Absolute Maximum Ratings		$T_s = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT - Inverter, Chopper				
V_{CES}	$T_s = 25 (70)^\circ\text{C}$	1200	V	
I_C		115 (93)	A	
I_{CRM}		300	A	
V_{GES}		± 20	V	
T_j		- 40 ... + 175	$^\circ\text{C}$	
Diode - Inverter, Chopper				
I_F	$T_s = 25 (70)^\circ\text{C}$	99 (79)	A	
I_{FRM}		300	A	
T_j		- 40 ... + 175	$^\circ\text{C}$	
Diode - Rectifier				
V_{RRM}	$T_s = 70^\circ\text{C}$	1600	V	
I_F		83	A	
I_{FSM}		$t_p = 10$ ms, sin 180 $^\circ$, $T_j = 25^\circ\text{C}$	1000	A
i^2t		$t_p = 10$ ms, sin 180 $^\circ$, $T_j = 25^\circ\text{C}$	6600	A^2s
T_j		- 40 ... + 150	$^\circ\text{C}$	
Module				
I_{RMS}	per power terminal (20 A / spring)	80	A	
T_{stg}		- 40 ... + 125	$^\circ\text{C}$	
V_{isol}	AC, 1 min.	2500	V	

Characteristics		$T_s = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT - Inverter, Chopper					
V_{CEsat}	$I_{Cnom} = 100$ A, $T_j = 25 (150)^\circ\text{C}$		1,8 (2,2)	2 (2,4)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 4$ mA	5	5,8	6,5	V
$V_{CE(TO)}$	$T_j = 25 (150)^\circ\text{C}$		0,8 (0,7)	0,9 (0,8)	V
r_T	$T_j = 25 (150)^\circ\text{C}$		10 (15)	11 (16)	m Ω
C_{ies}	$V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz		4,4		nF
C_{oes}	$V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz		0,29		nF
C_{res}	$V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz		0,24		nF
$R_{th(j-s)}$	per IGBT		0,48		K/W
$t_{d(on)}$	under following conditions		160		ns
t_r	$V_{CC} = 600$ V, $V_{GE} = \pm 15$ V		35		ns
$t_{d(off)}$	$I_{Cnom} = 100$ A, $T_j = 150^\circ\text{C}$		390		ns
t_f	$R_{Gon} = R_{Goff} = 1 \Omega$		75		ns
E_{on}	inductive load		11,2		mJ
E_{off}			10		mJ
Diode - Inverter, Chopper					
$V_F = V_{EC}$	$I_{Fnom} = 100$ A, $T_j = 25 (150)^\circ\text{C}$		2,2 (2,1)	2,5 (2,45)	V
$V_{(TO)}$	$T_j = 25 (150)^\circ\text{C}$		1,3 (0,9)	1,5 (1,1)	V
r_T	$T_j = 25 (150)^\circ\text{C}$		9 (12)	10 (14)	m Ω
$R_{th(j-s)}$	per diode		0,66		K/W
I_{RRM}	under following conditions		82		A
Q_{rr}	$I_{Fnom} = 100$ A, $V_R = 600$ V		16,4		μC
E_{rr}	$V_{GE} = 0$ V, $T_j = 150^\circ\text{C}$		6,5		mJ
	$di_F/dt = 2400$ A/ μs				
Diode - Rectifier					
V_F	$I_{Fnom} = 75$ A, $T_j = 25^\circ\text{C}$		1,2		V
$V_{(TO)}$	$T_j = 150^\circ\text{C}$		0,8		V
r_T	$T_j = 150^\circ\text{C}$		7		m Ω
$R_{th(j-s)}$	per diode		0,7		K/W
Temperature Sensor					
R_{ts}	3 %, $T_r = 25 (100)^\circ\text{C}$		1000(1670)		Ω
Mechanical Data					
w			95		g
M_s	Mounting torque	2		2,5	Nm

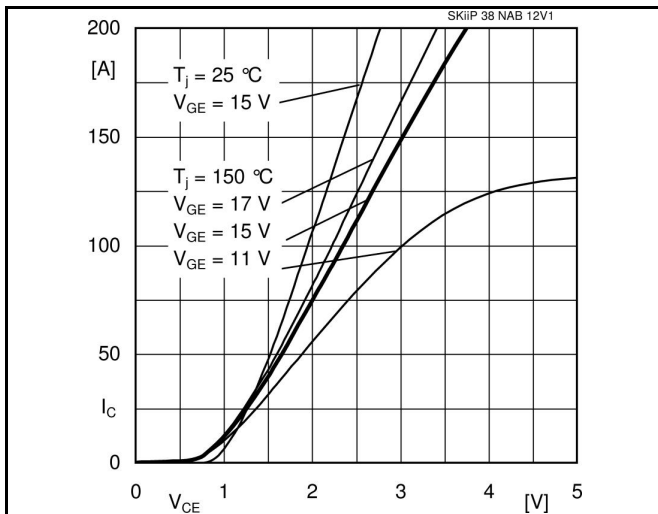


Fig. 1 Typ. output characteristic

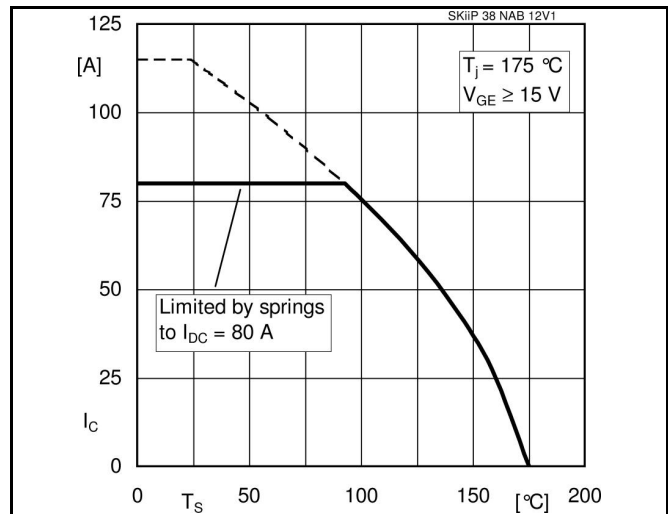


Fig. 2 Typ. rated current vs. temperature $I_C = f(T_S)$

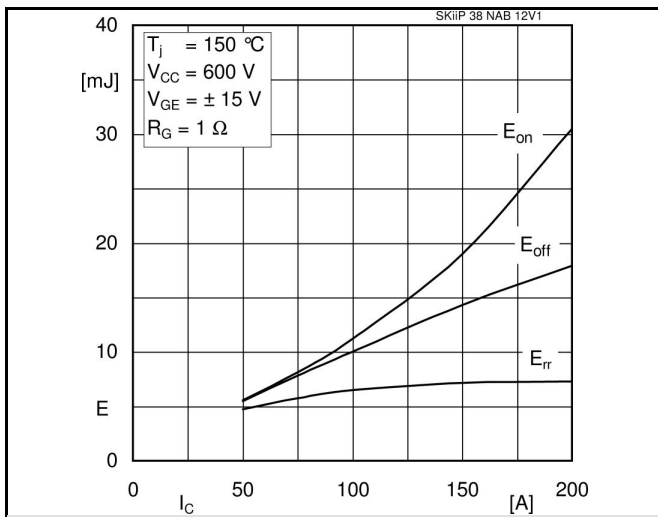


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

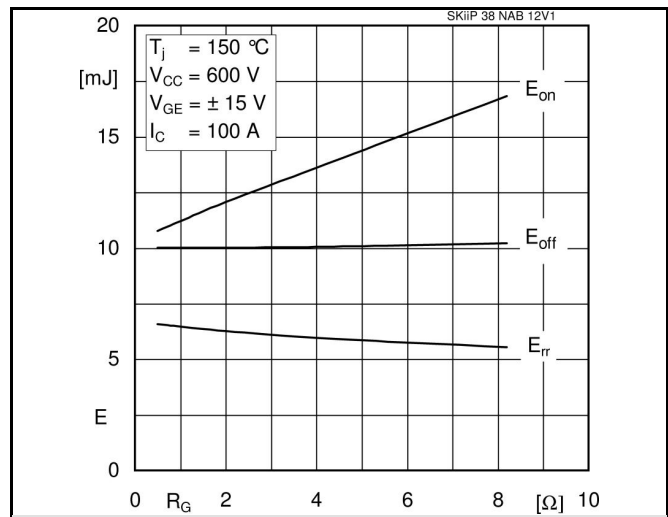


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

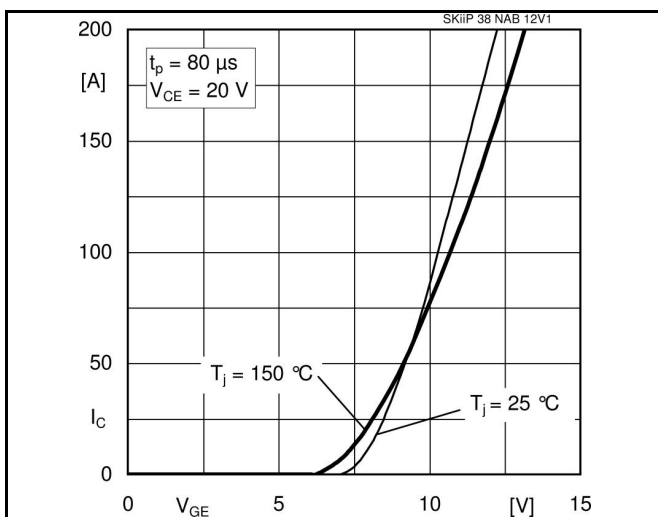


Fig. 5 Typ. transfer characteristic

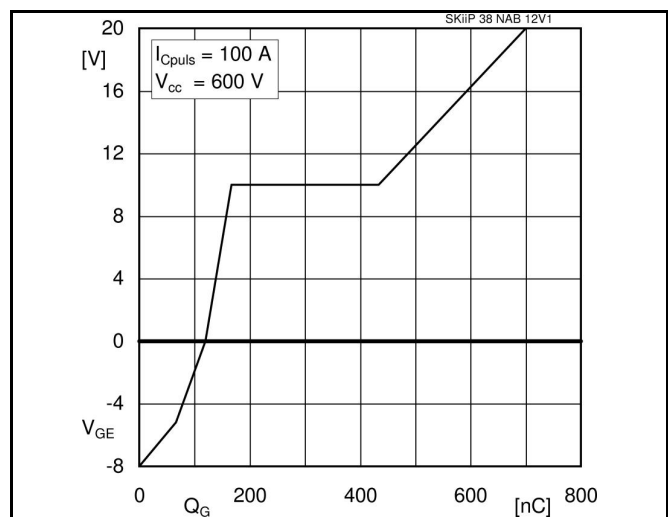
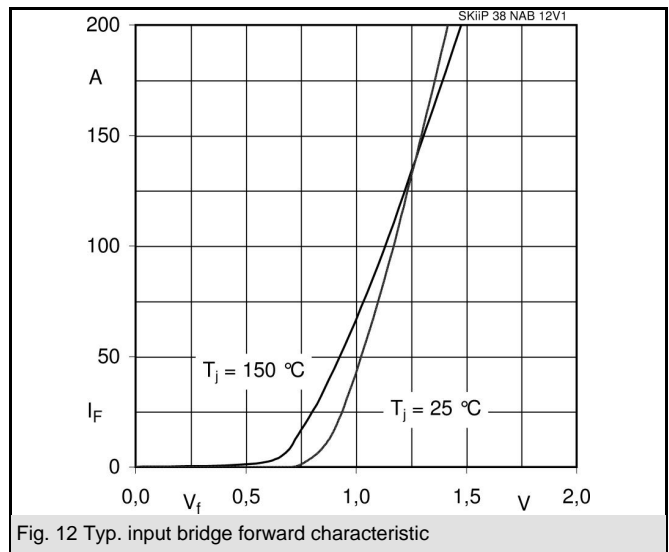
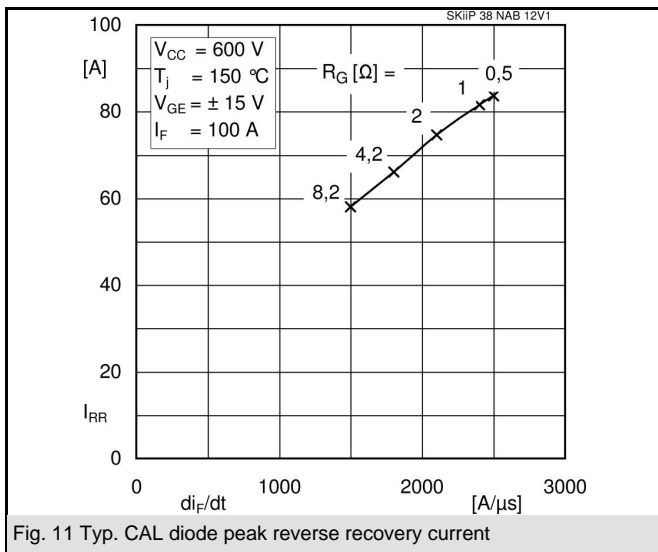
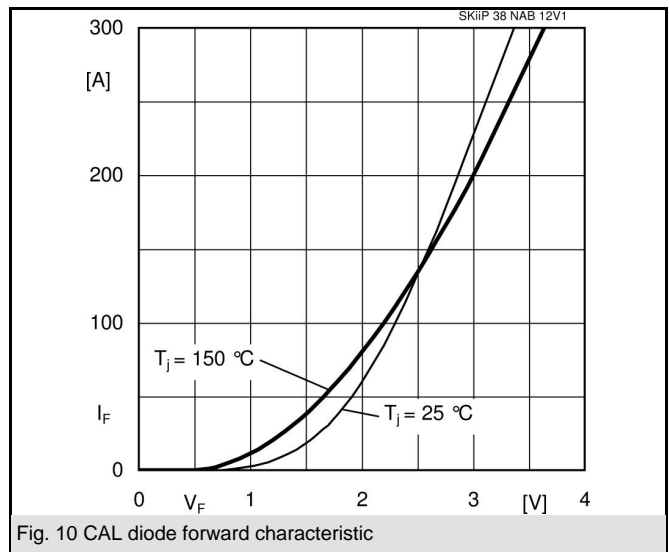
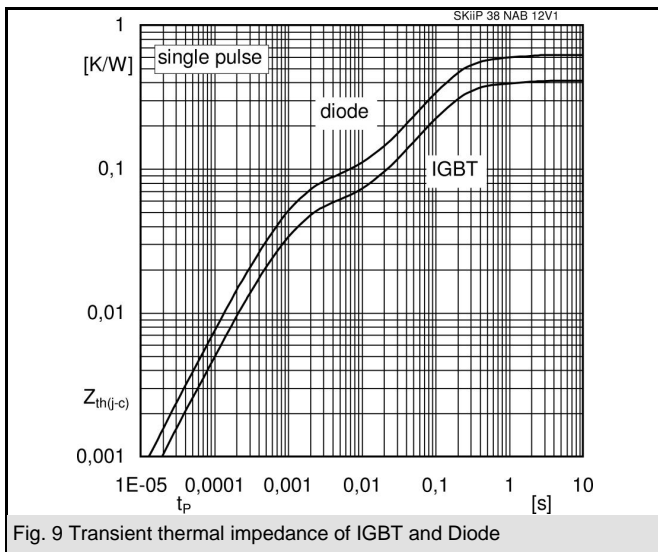
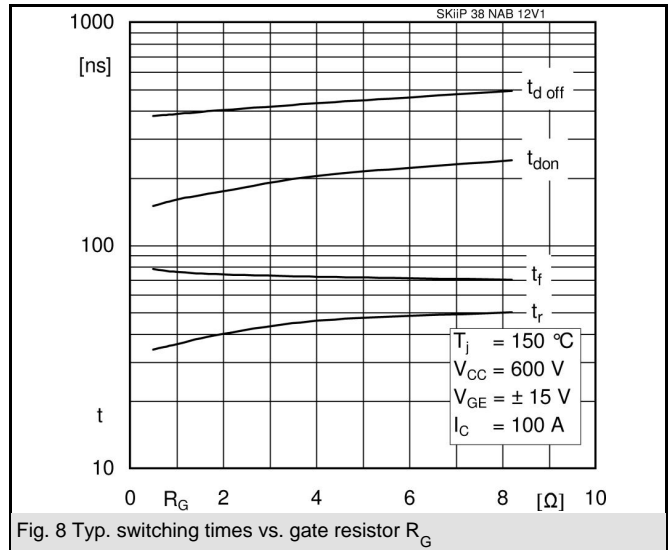
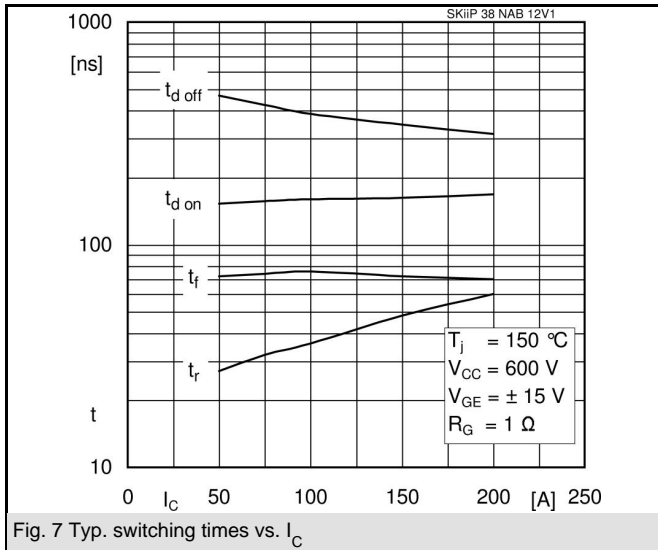
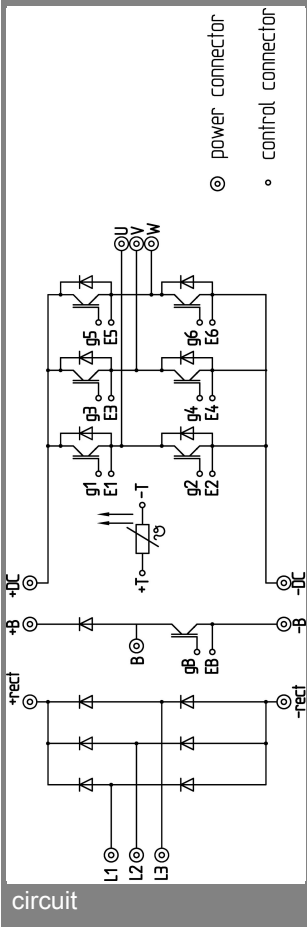


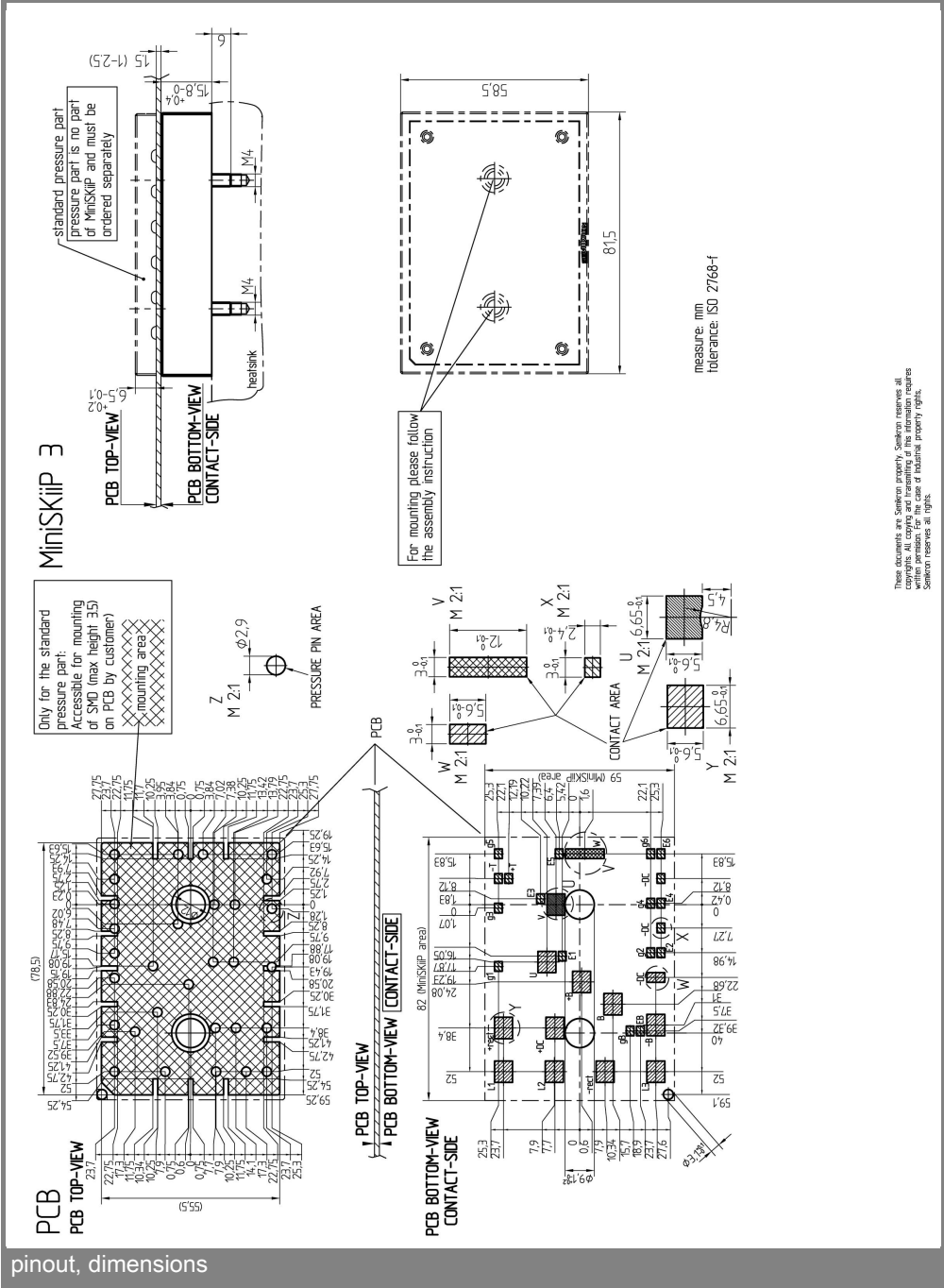
Fig. 6 Typ. gate charge characteristic



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circuit



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