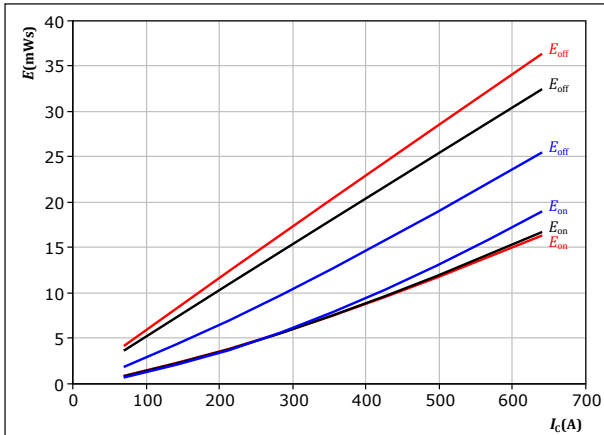




DC-Link Switching Characteristics

figure 38. IGBT

Typical switching energy losses as a function of collector current
 $E = f(I_c)$

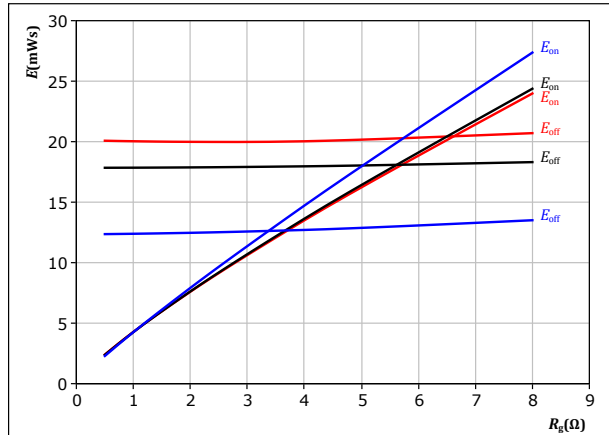


With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 2 \text{ } \Omega$
 $R_{goff} = 2 \text{ } \Omega$

T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 39. IGBT

Typical switching energy losses as a function of IGBT turn on gate resistor
 $E = f(R_g)$

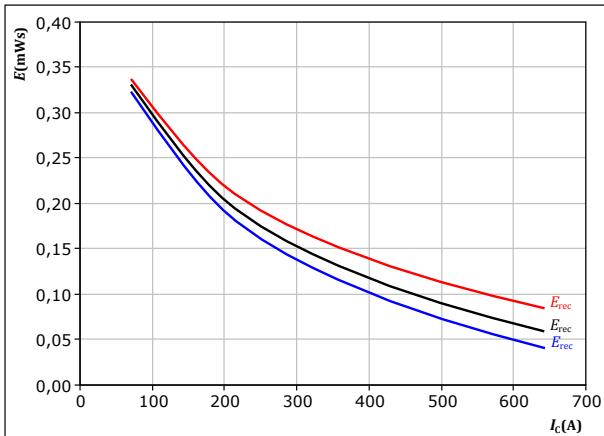


With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 355 \text{ A}$

T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 40. FWD

Typical reverse recovered energy loss as a function of collector current
 $E_{rec} = f(I_c)$

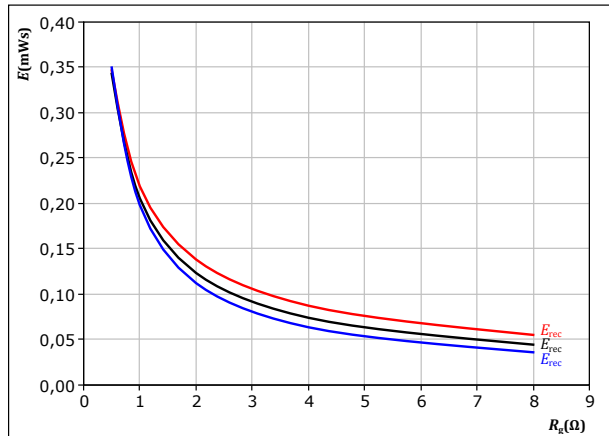


With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 2 \text{ } \Omega$

T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 41. FWD

Typical reverse recovered energy loss as a function of IGBT turn on gate resistor
 $E_{rec} = f(R_g)$



With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 355 \text{ A}$

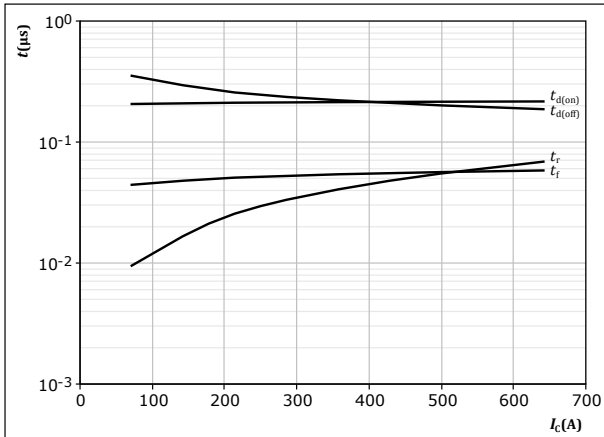
T_j : 25 °C (blue), 125 °C (black), 150 °C (red)



DC-Link Switching Characteristics

figure 42. IGBT

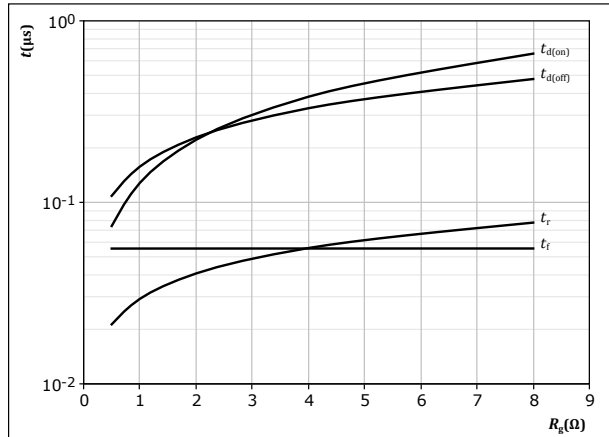
Typical switching times as a function of collector current
 $t = f(I_c)$



With an inductive load at
 $T_j = 150 \text{ }^\circ\text{C}$
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 2 \text{ } \Omega$
 $R_{goff} = 2 \text{ } \Omega$

figure 43. IGBT

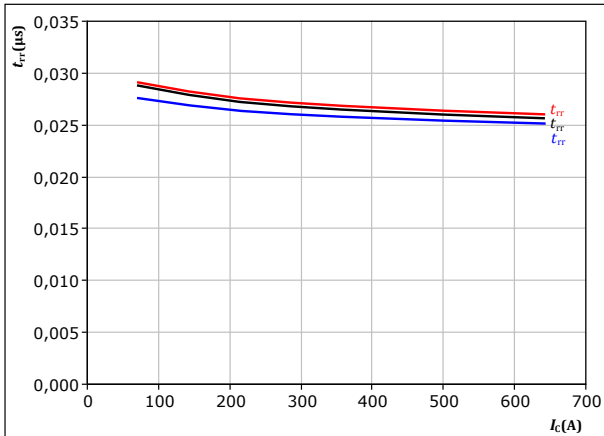
Typical switching times as a function of IGBT turn on gate resistor
 $t = f(R_g)$



With an inductive load at
 $T_j = 150 \text{ }^\circ\text{C}$
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 355 \text{ A}$

figure 44. FWD

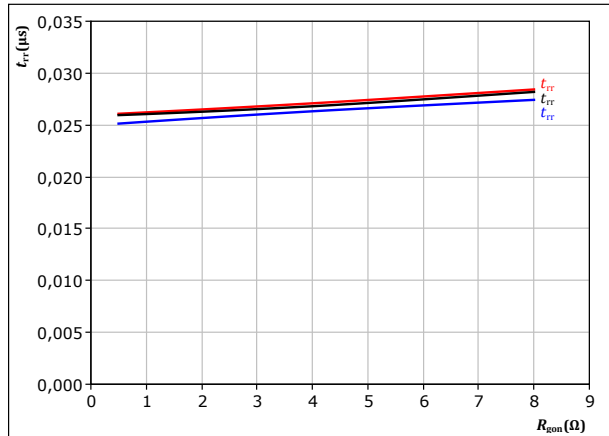
Typical reverse recovery time as a function of collector current
 $t_{rr} = f(I_c)$



With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 2 \text{ } \Omega$
 $T_j:$ — 25 °C
 — 125 °C
 — 150 °C

figure 45. FWD

Typical reverse recovery time as a function of IGBT turn on gate resistor
 $t_{rr} = f(R_{gon})$



With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 355 \text{ A}$
 $T_j:$ — 25 °C
 — 125 °C
 — 150 °C

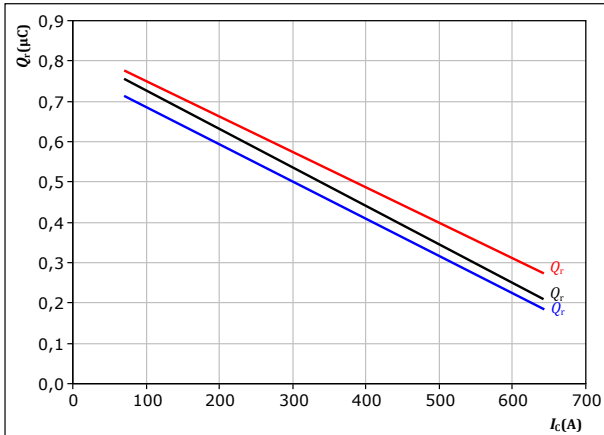


DC-Link Switching Characteristics

figure 46. FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$



With an inductive load at

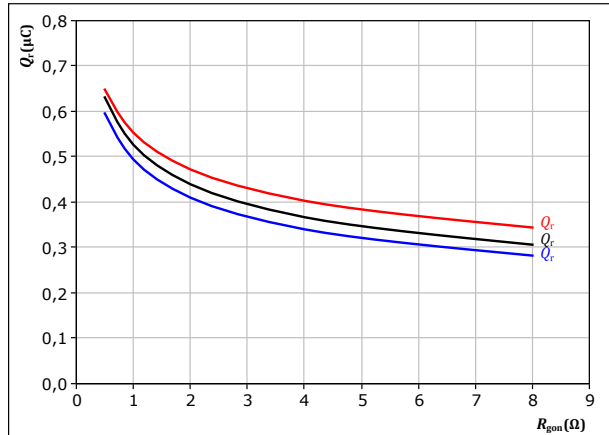
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 2 \ \Omega$

T_j : — 25 °C
 — 125 °C
 — 150 °C

figure 47. FWD

Typical recovered charge as a function of IGBT turn on gate resistor

$$Q_r = f(R_{gon})$$



With an inductive load at

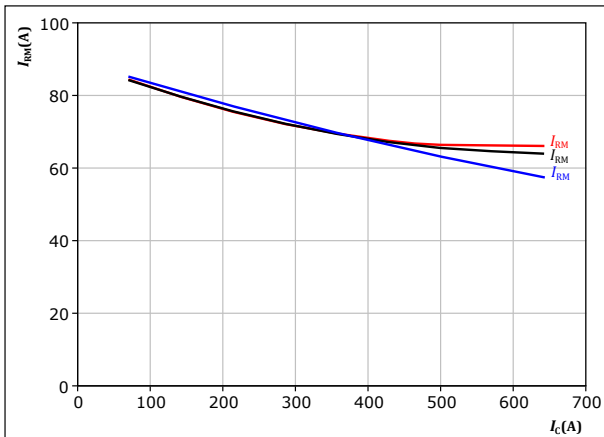
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 355 \text{ A}$

T_j : — 25 °C
 — 125 °C
 — 150 °C

figure 48. FWD

Typical peak reverse recovery current as a function of collector current

$$I_{RM} = f(I_c)$$



With an inductive load at

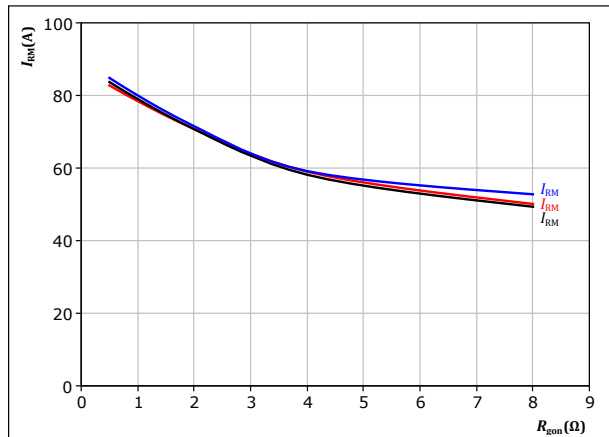
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 2 \ \Omega$

T_j : — 25 °C
 — 125 °C
 — 150 °C

figure 49. FWD

Typical peak reverse recovery current as a function of IGBT turn on gate resistor

$$I_{RM} = f(R_{gon})$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 355 \text{ A}$

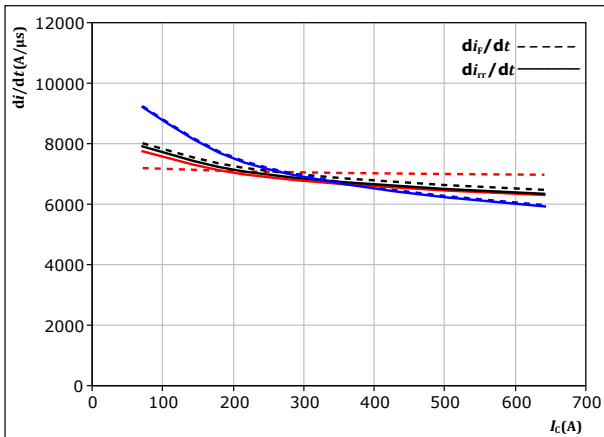
T_j : — 25 °C
 — 125 °C
 — 150 °C



DC-Link Switching Characteristics

figure 50. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_f/dt, di_{rr}/dt = f(I_c)$

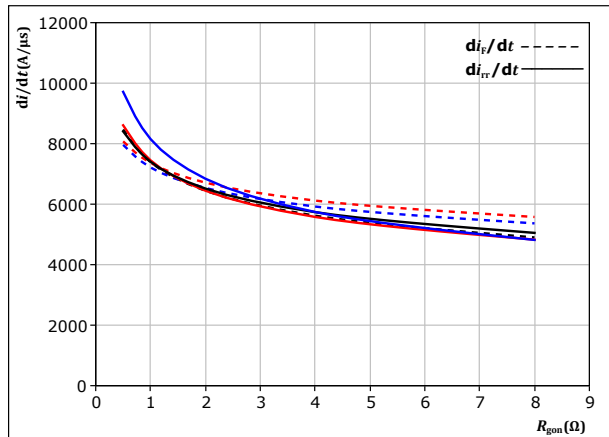


With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 2 \text{ } \Omega$

T_j :
 — 25 °C
 — 125 °C
 — 150 °C

figure 51. FWD

Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_{rr}/dt = f(R_{gon})$

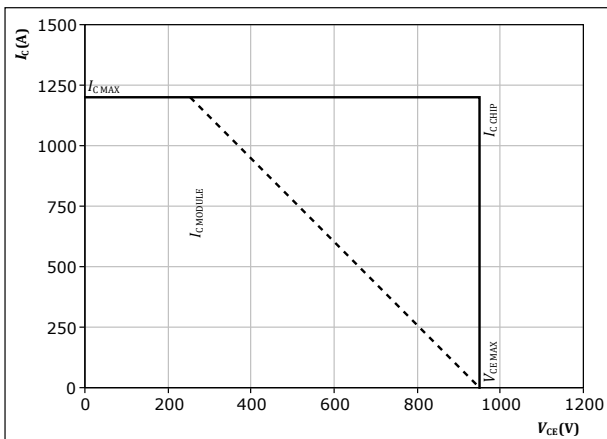


With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 355 \text{ A}$

T_j :
 — 25 °C
 — 125 °C
 — 150 °C

figure 52. IGBT

Reverse bias safe operating area
 $I_c = f(V_{CE})$



At $T_j = 150 \text{ } ^\circ\text{C}$
 $R_{gon} = 2 \text{ } \Omega$
 $R_{goff} = 2 \text{ } \Omega$



Switching Definitions

figure 53. IGBT

Turn-off Switching Waveforms & definition of t_{doff} , t_{Eoff} (t_{Eoff} = integrating time for E_{off})

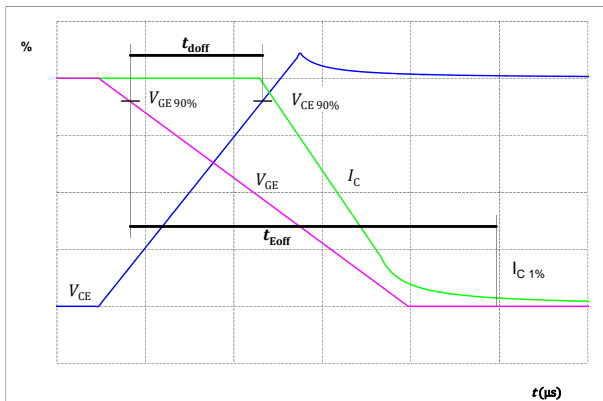


figure 54. IGBT

Turn-on Switching Waveforms & definition of t_{don} , t_{Eon} (t_{Eon} = integrating time for E_{on})

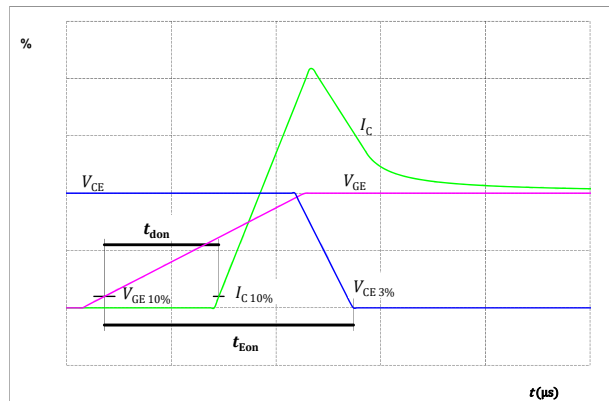


figure 55. IGBT

Turn-off Switching Waveforms & definition of t_f

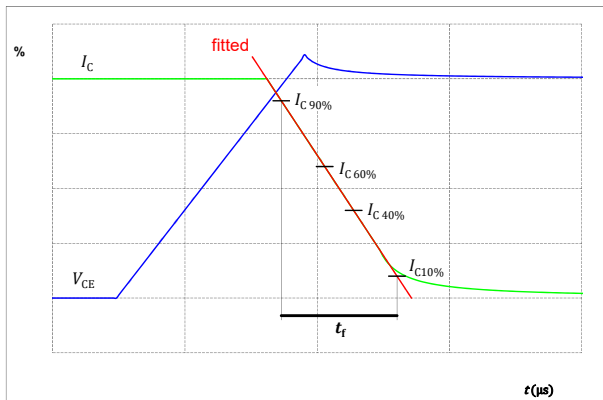
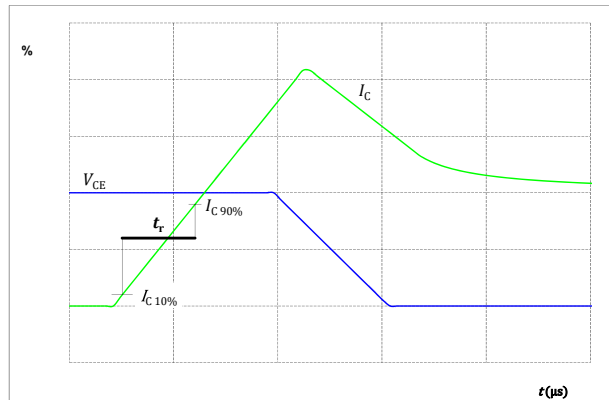


figure 56. IGBT

Turn-on Switching Waveforms & definition of t_r





Switching Definitions

figure 57. FWD

Turn-off Switching Waveforms & definition of t_{rr}

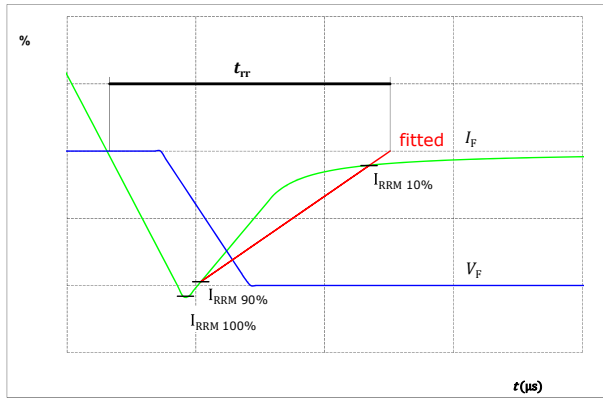
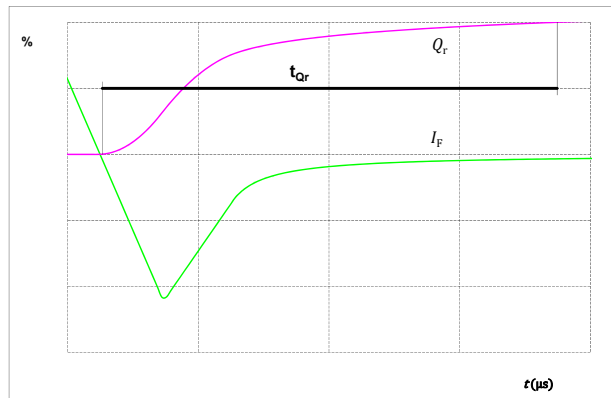


figure 58. FWD

Turn-on Switching Waveforms & definition of t_{Qr} (t_{Qr} = integrating time for Q_r)






Vincotech

B0-SP10NAD600S704-PE19F18T
B0-SP10NAE600S704-PE29F18T

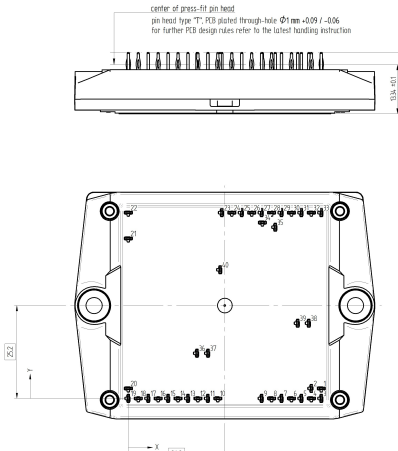
datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	B0-SP10NAD600S704-PE19F18T
With thermal paste (5,2 W/mK, PTM6000HV)	B0-SP10NAD600S704-PE19F18T-/7/

Marking						
	Text	Name	Date code	UL & VIN	Lot	Serial
		NN-NNNNNNNNNNNNNNNN- TTTTTVV	WWYY	UL VIN	LLLLL	SSSS
	Datamatrix	Type&Ver	Lot number	Serial	Date code	
		TTTTTTTV	LLLLL	SSSS	WWYY	

High Side Module B0-SP10NAD600S704-PE19F18T

Pin table [mm]			
Pin	X	Y	Function
1	52,4	2,7	GND1
2	49,7	2,7	GND1
3	52,4	0	GND1
4	49,7	0	GND1
5	47	0	GND1
6	44,3	0	GND1
7	41,6	0	GND1
8	38,9	0	GND1
9	36,2	0	GND1
10	24,3	0	DC+
11	21,6	0	DC+
12	18,9	0	DC+
13	16,2	0	DC+
14	13,5	0	DC+
15	10,8	0	DC+
16	8,1	0	DC+
17	5,4	0	DC+
18	2,7	0	DC+
19	0	0	DC+
20	0	2,7	DC+
21	0	43,4	Therm1
22	0	50,4	Therm2
23	25,4	50,4	Ph1
24	28,1	50,4	Ph1
25	30,8	50,4	Ph1
26	33,5	50,4	Ph1
27	36,2	50,4	Ph1
28	38,9	50,4	Ph1
29	41,6	50,4	Ph1
30	44,3	50,4	Ph1
31	47	50,4	Ph1
32	49,7	50,4	Ph1
33	52,4	50,4	Ph1
34	36,4	47,7	S13
35	39,9	46,45	G13
36	18,65	12,25	G11
37	21,65	12,25	S11
38	49	20,4	S16
39	46	20,4	G16
40	24,95	34,9	C13



center of press-fit pin head
pin head type TT: PCB plated through-hole $\Phi 1\text{ mm } +0,09 / -0,06$
for further PCB design rules refer to the latest handling instruction

Tolerance of positions: $\pm 0,1\text{ mm}$ of the end of pins
Tolerance of coordinate size is only stated without tolerance

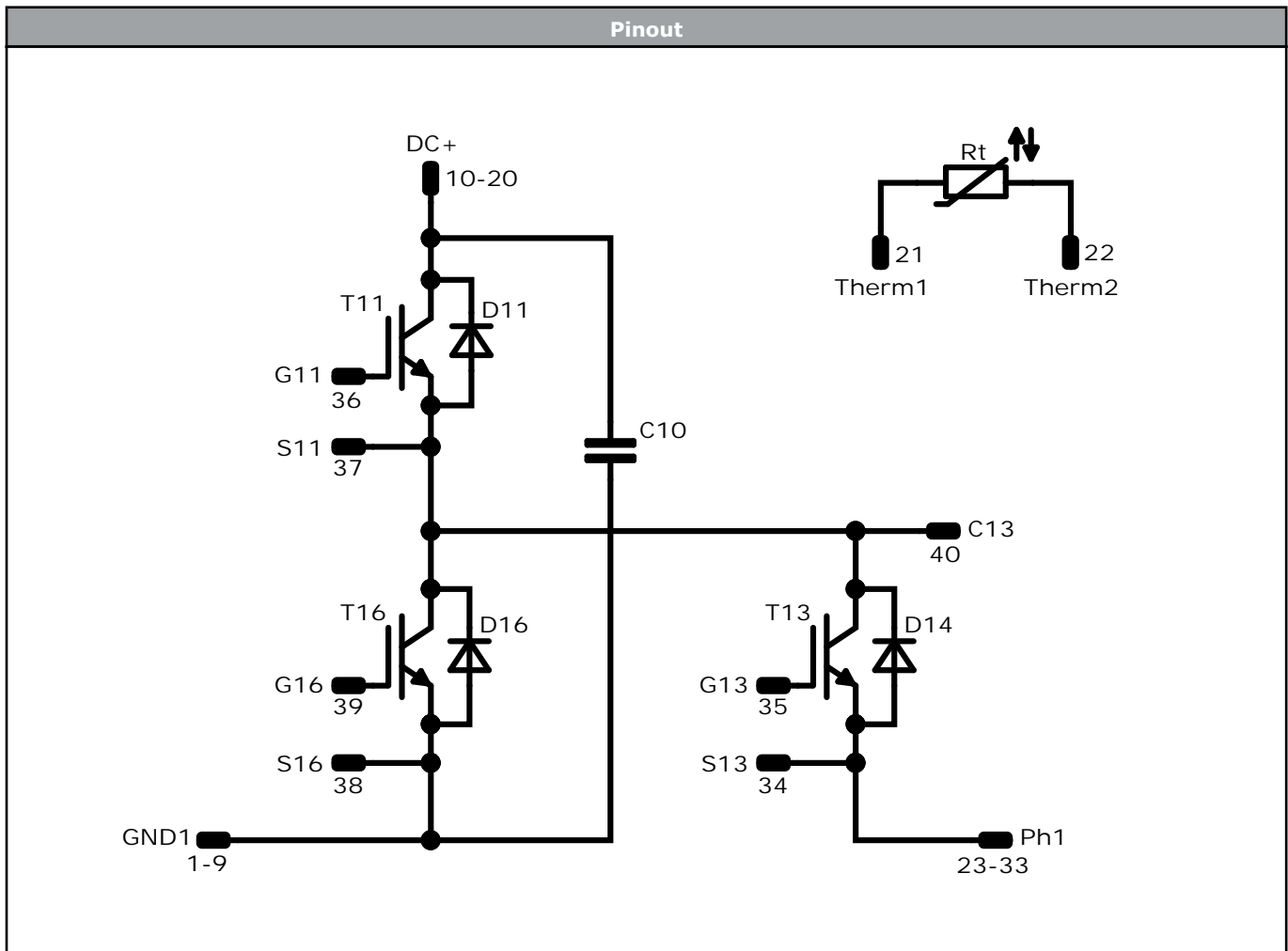


Vincotech

B0-SP10NAD600S704-PE19F18T
B0-SP10NAE600S704-PE29F18T

datasheet

High Side Module B0-SP10NAD600S704-PE19F18T




Identification					
ID	Component	Voltage	Current	Function	Comment
T13	IGBT	950 V	400 A	AC Switch	
D14	FWD	950 V	300 A	AC Diode	
T16	IGBT	950 V	400 A	Neutral Point Switch	
D11	FWD	950 V	300 A	DC-Link Diode	
T11	IGBT	950 V	600 A	DC-Link Switch	
D16	FWD	1200 V	160 A	Neutral Point Diode	
C10	Capacitor	1000 V		Capacitor (DC)	
Rt	Thermistor			Thermistor	



Vincotech

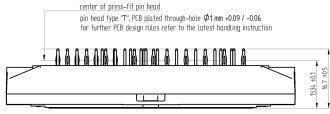
B0-SP10NAD600S704-PE19F18T
B0-SP10NAE600S704-PE29F18T
 datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	B0-SP10NAE600S704-PE29F18T
With thermal paste (5,2 W/mK, PTM6000HV)	B0-SP10NAE600S704-PE29F18T-/7/

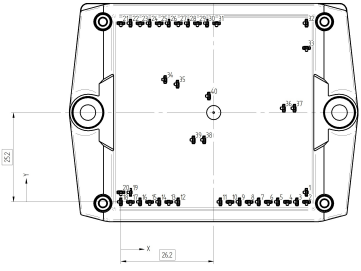
Marking						
	Text	Name NN-NNNNNNNNNNNNNN- TTTTTVV	Date code WWYY	UL & VIN UL VIN	Lot LLLLL	Serial SSSS
	Datamatrix	Type&Ver TTTTTVV	Lot number LLLLL	Serial SSSS	Date code WWYY	

Low Side Module B0-SP10NAE600S704-PE29F18T

Pin table [mm]			
Pin	X	Y	Function
1	52,4	2,7	DC-
2	52,4	0	DC-
3	49,7	0	DC-
4	47	0	DC-
5	44,3	0	DC-
6	41,6	0	DC-
7	38,9	0	DC-
8	36,2	0	DC-
9	33,5	0	DC-
10	30,8	0	DC-
11	28,1	0	DC-
12	16,2	0	GND2
13	13,5	0	GND2
14	10,8	0	GND2
15	8,1	0	GND2
16	5,4	0	GND2
17	2,7	0	GND2
18	0	0	GND2
19	2,7	2,7	GND2
20	0	2,7	GND2
21	0	50,4	Ph2
22	2,7	50,4	Ph2
23	5,4	50,4	Ph2
24	8,1	50,4	Ph2
25	10,8	50,4	Ph2
26	13,5	50,4	Ph2
27	16,2	50,4	Ph2
28	18,9	50,4	Ph2
29	21,6	50,4	Ph2
30	24,3	50,4	Ph2
31	27	50,4	Ph2
32	52,4	50,4	Therm1
33	52,4	43,4	Therm2
34	12,5	34,5	G14
35	16	33,2	S14
36	46	26,4	G12
37	49	26,4	S12
38	23,5	17,5	S15
39	20,5	17,5	G15
40	24,85	29,85	C12



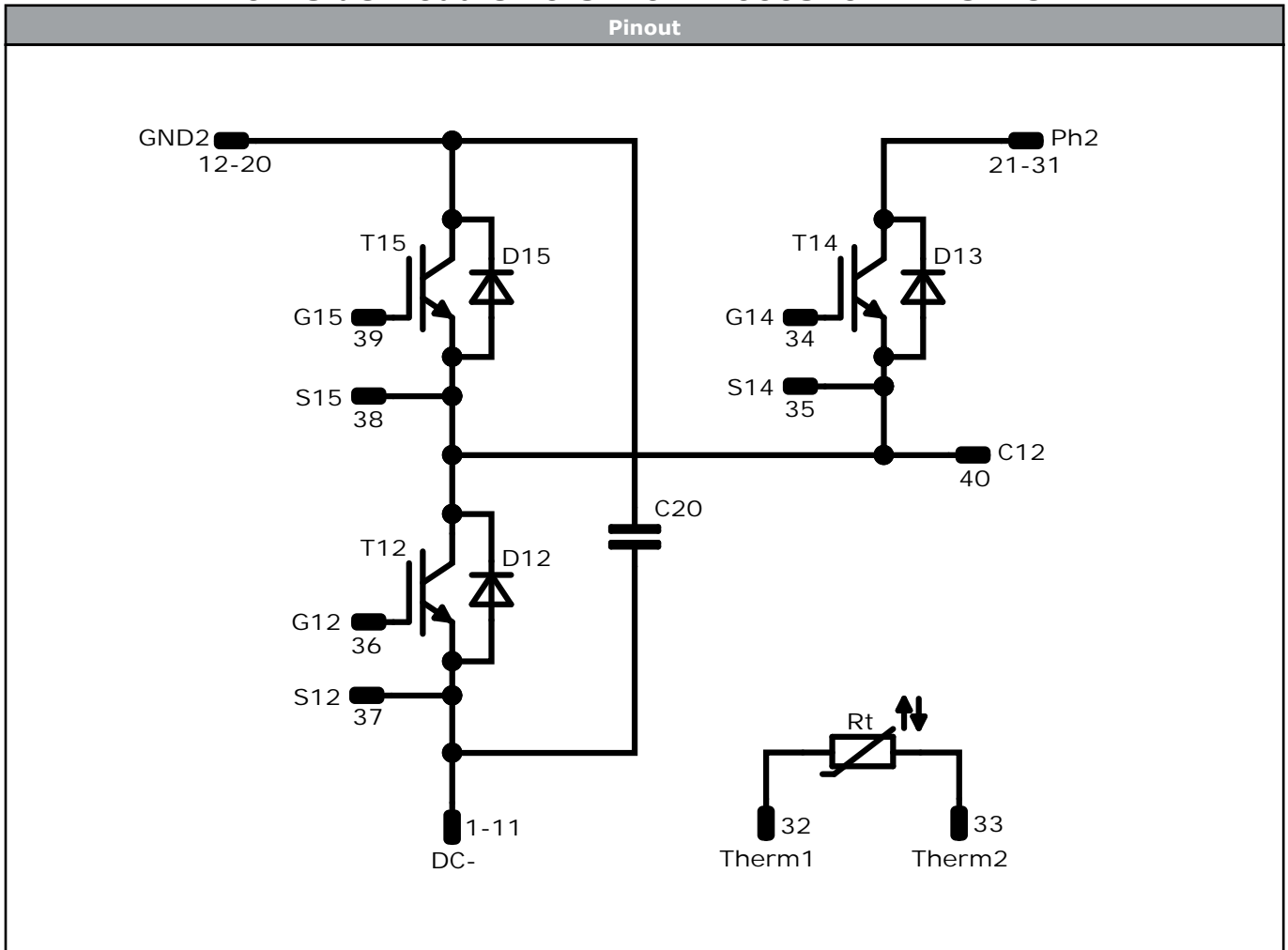
center of press-fit pin head
pin head type "T", PCB drilled through-hole Ø1 mm ±0,01 / ±0,05
for further PCB design rules refer to the latest handling instruction



Tolerance of positions: ±0,05 mm at the end of pins
Dimension of coordinate axis is only offset without tolerance



Low Side Module B0-SP10NAE600S704-PE29F18T



Identification					
ID	Component	Voltage	Current	Function	Comment
T14	IGBT	950 V	400 A	AC Switch	
D13	FWD	950 V	300 A	AC Diode	
T15	IGBT	950 V	400 A	Neutral Point Switch	
D12	FWD	950 V	300 A	DC-Link Diode	
T12	IGBT	950 V	600 A	DC-Link Switch	
D15	FWD	1200 V	160 A	Neutral Point Diode	
C20	Capacitor	1000 V		Capacitor (DC)	
Rt	Thermistor			Thermistor	




Packaging instruction				
Standard packaging quantity (SPQ) 45	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for <i>flow</i> S3 packages see vincotech.com website.

Package data
Package data for <i>flow</i> S3 packages see vincotech.com website.

Vincotech thermistor reference
See Vincotech thermistor reference table at vincotech.com website.

UL recognition and file number
This device is certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website. 

Document No.:	Date:	Modification:	Pages
B0-SP10NAX600S704-PEX9F18T-D1-14	1 Aug. 2022		

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.