Vincotech

70-W624NIA1K8M701-LD00FP70

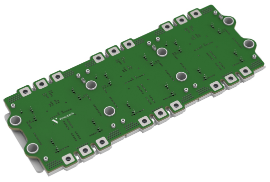
target datasheet

VINcoNPC X12 **1200 V / 1800 A**

Topology features

- Kelvin Emitter for improved switching performance
- Temperature sensor
- Neutral Point Clamped Topology (I-Type)

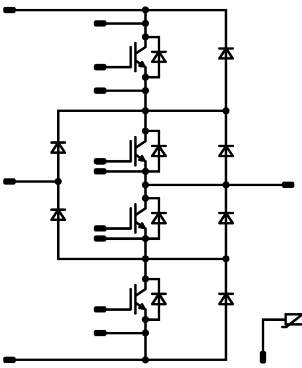
VINco X12 12 mm housing



Component features

- Easy paralleling
- Low turn-off losses
- Low collector emitter saturation voltage
- Positive temperature coefficient
- Short tail current
- Switching optimized for EMC

Schematic



Housing features

- Base isolation: Al_2O_3
- Enables high switching frequencies
- Low inductive package
- Optimal current sharing
- Optimized for three-level topologies
- Thermo-mechanical push-and-pull force relief
- M6 High Power Screw Contact
- Press-fit connection to driver PCB

Target applications

- Solar Inverters

Types

- 70-W624NIA1K8M701-LD00FP70

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Buck Switch					
Collector-emitter voltage	V_{CES}			1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	1444	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		3600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	2500	W
Gate-emitter voltage	V_{GES}			±20	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 800 V	T_j = 150 °C	9,5	µs
Maximum junction temperature	T_{jmax}			175	°C
Buck Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	1024	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	1557	W
Maximum junction temperature	T_{jmax}			175	°C
Buck Sw. Protection Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	102	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 25 °C	390	A
Surge current capability	I^2t			756	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	271	W
Maximum junction temperature	T_{jmax}			175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Boost Switch					
Collector-emitter voltage	V_{CES}			1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	1444	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		3600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	2500	W
Gate-emitter voltage	V_{GES}			±20	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 800 V	T_j = 150 °C	9,5	µs
Maximum junction temperature	T_{jmax}			175	°C
Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	992	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	1484	W
Maximum junction temperature	T_{jmax}			175	°C
Boost Sw. Inv. Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	992	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	1484	W
Maximum junction temperature	T_{jmax}			175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Boost Sw. Protection Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	102	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 25 °C	390	A
Surge current capability	I^2t			756	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	271	W
Maximum junction temperature	T_{jmax}			175	°C
Module Properties					
Thermal Properties					
Storage temperature	T_{stg}			-40…+125	°C
Operation temperature under switching condition	T_{jop}			-40…+(T_{jmax} - 25)	°C
Isolation Properties					
Isolation voltage	V_{isol}	DC Test Voltage*	t_p = 2 s	6000	V
Creepage distance				>12,7	mm
Clearance				>12,7	mm
Comparative Tracking Index	CTI			≥ 200	

*100 % tested in production

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	
Buck Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$			10	0,18	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		1800	25 125 150		1,58 1,8 1,86	1,85(1)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			1200	µA
Gate-emitter leakage current	I_{GES}		20	0		25			6000	nA
Internal gate resistance	r_g							0,25		Ω
Input capacitance	C_{ies}		0	10		25		360000		pF
Output capacitance	C_{oes}		0	10		25		10560		pF
Reverse transfer capacitance	C_{res}		0	10		25		3840		pF
Gate charge	Q_g	V_{CC} = 600 V	0/15		1800	25		12000		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,04		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 0,5 Ω R_{goff} = 0,5 Ω	-8/16	600	1000	25 125 150		371 360 361		ns
Rise time	t_r	R_{gon} = 0,5 Ω R_{goff} = 0,5 Ω	-8/16	600	1000	25 125 150		82 83 80		ns
Turn-off delay time	$t_{d(off)}$	R_{gon} = 0,5 Ω R_{goff} = 0,5 Ω	-8/16	600	1000	25 125 150		391 432 447		ns
Fall time	t_f	R_{gon} = 0,5 Ω R_{goff} = 0,5 Ω	-8/16	600	1000	25 125 150		73,52 107,78 121,94		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=120,06 µC Q_{rFWD}=205,28 µC Q_{rFWD}=233,69 µC	-8/16	600	1000	25 125 150		135,63 164,08 168,7		mWs
Turn-off energy (per pulse)	E_{off}		-8/16	600	1000	25 125 150		78,24 107,23 116,68		mWs

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	
Buck Diode										
Static										
Forward voltage	V_F				1800	25 125 150		1,79 1,9 1,89	2,1(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25			480	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,06		K/W
Dynamic										
Peak recovery current	I_{RM}	d*i*/d*t*=10500 A/µs d*i*/d*t*=10750 A/µs d*i*/d*t*=18150 A/µs	-8/16	600	1000	25 125 150		751,14 908,91 980,51		A
Reverse recovery time	t_{rr}					25 125 150		305,14 418,68 453,17		ns
Recovered charge	Q_r					25 125 150		120,06 205,28 233,69		µC
Reverse recovered energy	E_{rec}					25 125 150		33,55 66,94 79,22		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		3048 2986 3688		A/µs

Characteristic Values

Parameter	Symbol	Conditions	V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	Unit
Buck Sw. Protection Diode										
Static										
Forward voltage	V_F				90	25 125 150		2,37 2,47	2,71(1) 2,77(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25 150		 5400	360 10800	μA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,35		K/W

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Vincotech

Characteristic Values

Parameter	Symbol	Conditions	V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Values Min	Values Typ	Values Max	Unit
Boost Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$			10	0,18	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		1800	25 125 150		1,58 1,8 1,86	1,85(1)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			1200	μA
Gate-emitter leakage current	I_{GES}		20	0		25			6000	nA
Internal gate resistance	r_g							0,25		Ω
Input capacitance	C_{ies}		0	10		25		360000		pF
Output capacitance	C_{oes}							10560		pF
Reverse transfer capacitance	C_{res}							3840		pF
Gate charge	Q_g	V_{CC} = 600 V	0/15		1800	25		12000		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,04		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 0,5 Ω R_{goff} = 0,5 Ω	-8/16	600	1000	25 125 150		353 346 346		ns
Rise time	t_r					25 125 150		76 72 74		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		734 433 449		ns
Fall time	t_f					25 125 150		84,28 107,63 123,6		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=120,29 μC Q_{rFWD}=208,47 μC Q_{rFWD}=231,29 μC				25 125 150		124,55 143,77 149,7		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		80,58 109,76 117,14		mWs

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	
Boost Diode										
Static										
Forward voltage	V_F				1800	25 125 150		1,79 1,9 1,89	2,1(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25			480	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,06		K/W
Dynamic										
Peak recovery current	I_{RM}	d*i*/d*t*=14863 A/µs d*i*/d*t*=13437 A/µs d*i*/d*t*=15000 A/µs	-8/16	600	1000	25 125 150		682,78 897,36 951,05		A
Reverse recovery time	t_{rr}					25 125 150		297,76 410,16 435,22		ns
Recovered charge	Q_r					25 125 150		120,29 208,47 231,29		µC
Reverse recovered energy	E_{rec}					25 125 150		34,37 69,68 78,26		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		3618 4229 4115		A/µs

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	
Boost Sw. Inv. Diode										
Static										
Forward voltage	V_F				1800	25 125 150		1,79 1,9 1,89	2,1(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25			480	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,06		K/W
Boost Sw. Protection Diode										
Static										
Forward voltage	V_F				90	25 125 150		2,37 2,47	2,71(1) 2,77(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25 150		 5400	360 10800	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,35		K/W

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	
Thermistor										
Static										
Rated resistance	R					25		7,33		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 1484 Ω				100	-5		5	%
Power dissipation	P					25		390		mW
Power dissipation constant	d					25		4,5		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %						3962		K
B-value	$B_{(25/100)}$	Tol. ±1 %						4000		K
Vincotech Thermistor Reference									I	

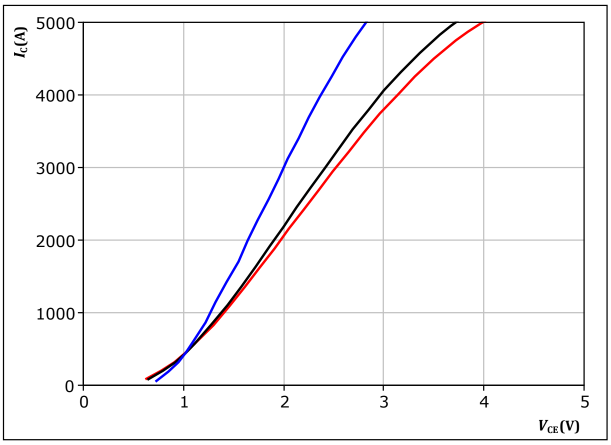
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Buck Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$

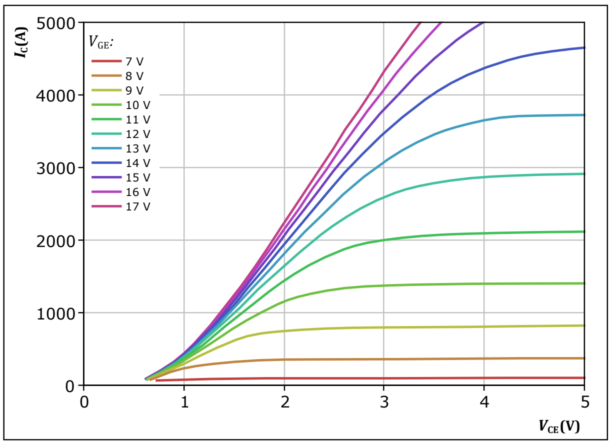


t_p = 250 µs
V_{GE} = 15 V
T_j: 25 °C, 125 °C, 150 °C

figure 2. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$

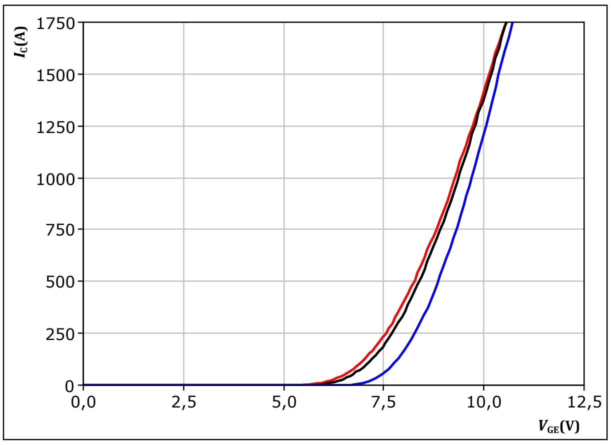


t_p = 250 µs
T_j = 150 °C
V_{GE} from 7 V to 17 V in steps of 1 V

figure 3. **IGBT**

Typical transfer characteristics

$I_C = f(V_{GE})$

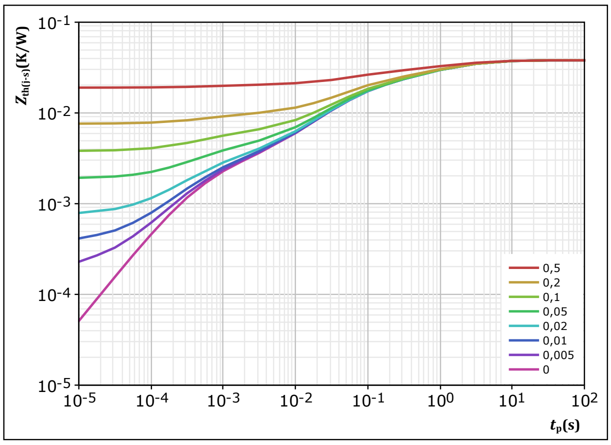


t_p = 250 µs
V_{CE} = 10 V
T_j: 25 °C, 125 °C, 150 °C

figure 4. **IGBT**

Transient thermal impedance as a function of pulse width

$Z_{th(j-s)} = f(t_p)$



$D = t_p / T$
$R_{th(j-s)}$ = 0,038 K/W

IGBT thermal model values

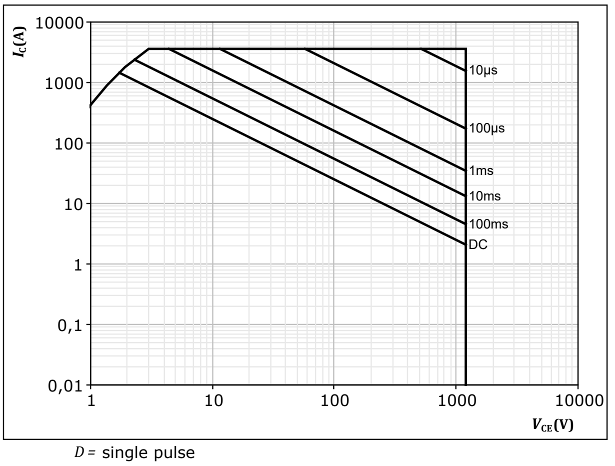
R (K/W)	τ (s)
5,61E-03	4,37E+00
9,65E-03	1,03E+00
8,04E-03	2,32E-01
1,06E-02	4,58E-02
1,75E-03	1,04E-02
1,31E-03	1,02E-03
1,08E-03	3,18E-04

Buck Switch Characteristics

figure 5.	IGBT

Safe operating area

I_C = f(V_{CE})

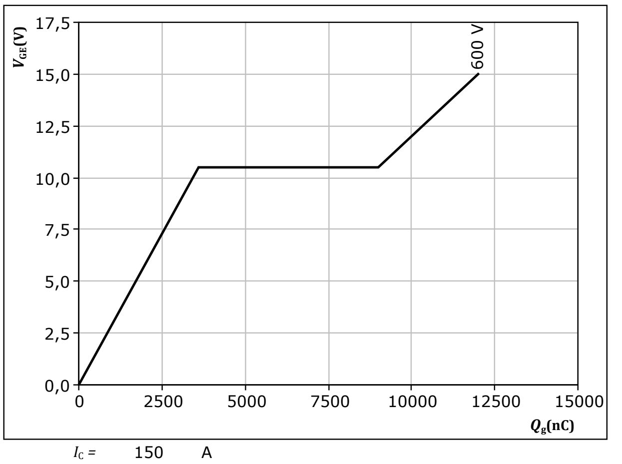


D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

figure 6.	IGBT

Gate voltage vs gate charge

V_{GE} = f(Q_g)



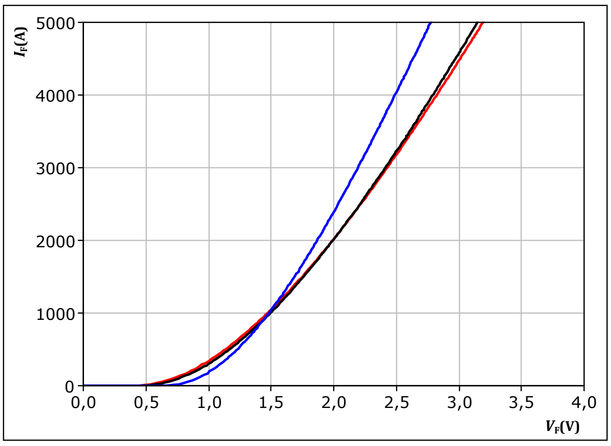
I_C =	150	A
T_j =	25	°C

Buck Diode Characteristics

figure 7. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



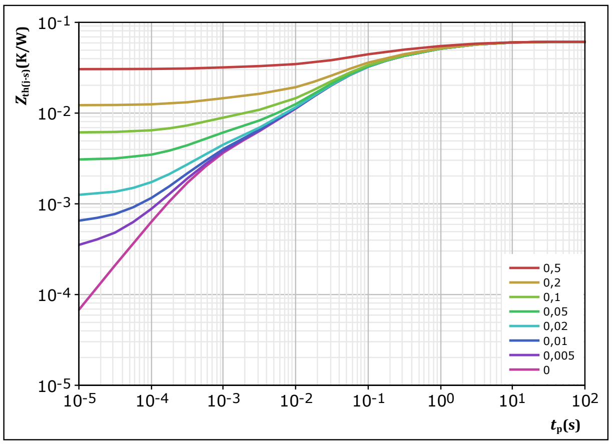
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 8. **FWD**

Transient thermal impedance as a function of pulse width

$Z_{th(j-s)} = f(t_p)$



$D = t_p / T$

$R_{th(j-s)}$ = 0,061 K/W

FWD thermal model values

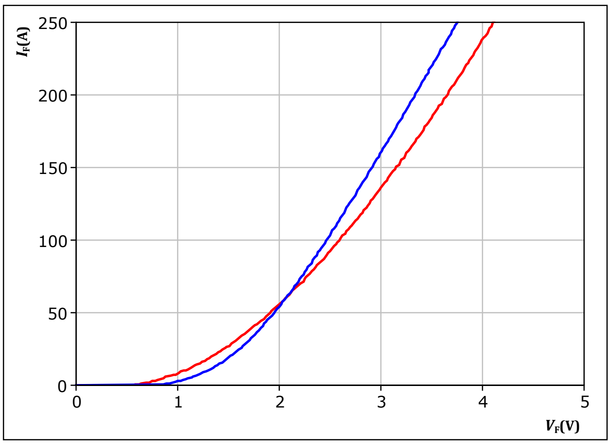
R (K/W)	τ (s)
5,55E-03	5,72E+00
1,06E-02	1,19E+00
1,36E-02	3,03E-01
1,75E-02	6,32E-02
9,19E-03	2,04E-02
1,97E-03	2,67E-03
2,64E-03	5,00E-04

Buck Sw. Protection Diode Characteristics

figure 9. FWD

Typical forward characteristics

I_F = f(V_F)



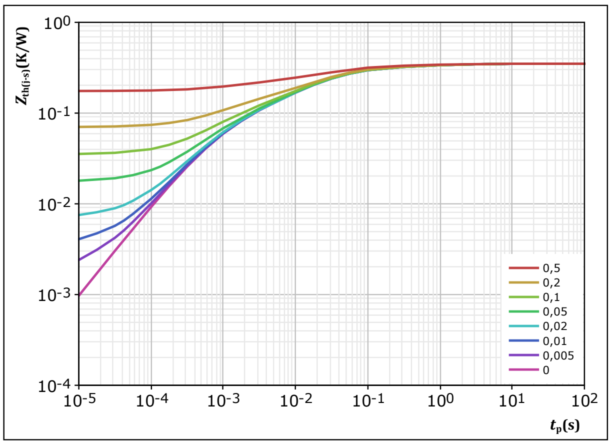
t_p = 250 µs

T_j: 25 °C, 125 °C

figure 10. FWD

Transient thermal impedance as a function of pulse width

$Z_{th(j\text{-}s)}$ = f(t_p)



D = t_p / T

$R_{th(j\text{-}s)}$ = 0,35 K/W

FWD thermal model values

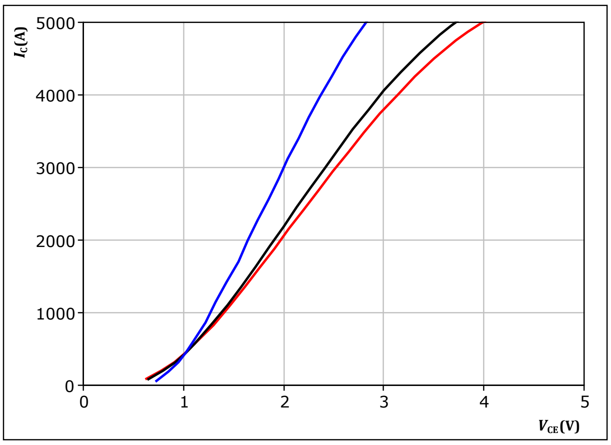
R (K/W)	τ (s)
1,65E-02	2,62E+00
3,35E-02	3,18E-01
8,98E-02	5,01E-02
1,07E-01	1,62E-02
6,29E-02	2,76E-03
2,24E-02	7,41E-04
1,78E-02	4,89E-04

Boost Switch Characteristics

figure 11. IGBT

Typical output characteristics

$I_C = f(V_{CE})$

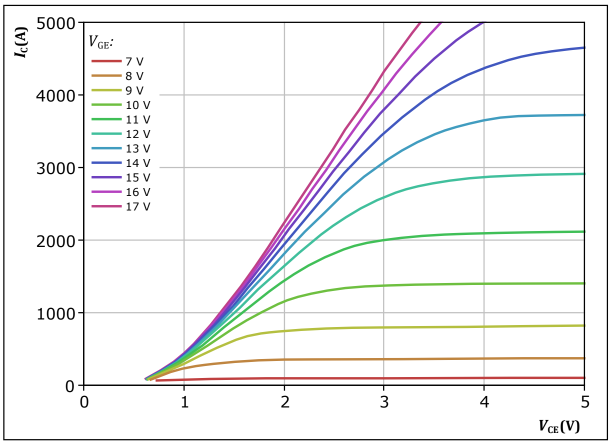


t_p =	250	μs	
V_{GE} =	15	V	
T_j:			25 °C
			125 °C
			150 °C

figure 12. IGBT

Typical output characteristics

$I_C = f(V_{CE})$



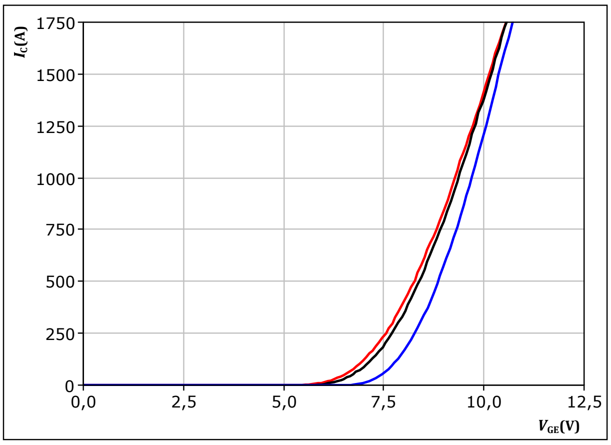
t_p =	250	μs
T_j =	150	°C

V_{GE} from 7 V to 17 V in steps of 1 V

figure 13. IGBT

Typical transfer characteristics

$I_C = f(V_{GE})$

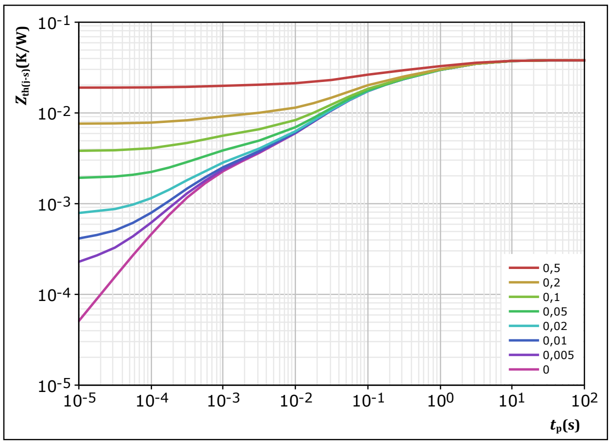


t_p =	250	μs	
V_{CE} =	10	V	
T_j:			25 °C
			125 °C
			150 °C

figure 14. IGBT

Transient thermal impedance as a function of pulse width

$Z_{th(j-s)} = f(t_p)$



D =	t_p / T	
$R_{th(j-s)}$ =	0,038	K/W

IGBT thermal model values

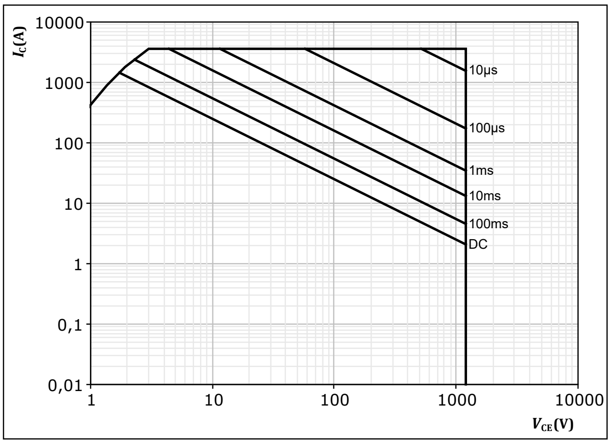
R (K/W)	τ (s)
5,61E-03	4,37E+00
9,65E-03	1,03E+00
8,04E-03	2,32E-01
1,06E-02	4,58E-02
1,75E-03	1,04E-02
1,31E-03	1,02E-03
1,08E-03	3,18E-04

Boost Switch Characteristics

figure 15. **IGBT**

Safe operating area

I_C = f(V_{CE})

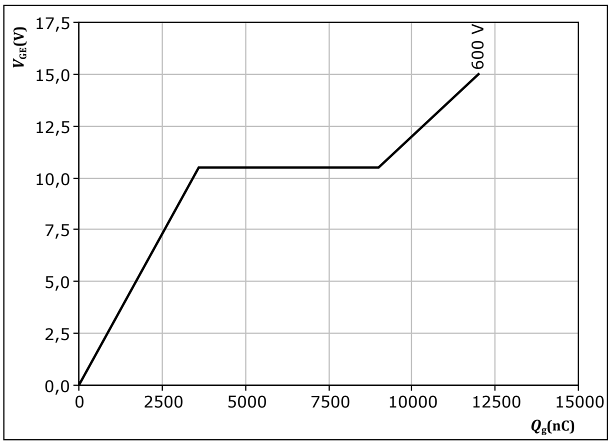


D = single pulse
T_s = 80 °C
V_{GE} = 15 V
T_j = T_{jmax}

figure 16. **IGBT**

Gate voltage vs gate charge

V_{GE} = f(Q_g)



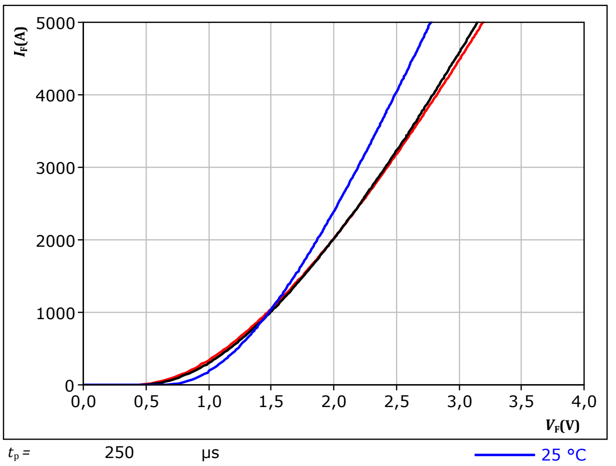
I_C = 150 A
T_j = 25 °C

Boost Diode Characteristics

figure 17. FWD

Typical forward characteristics

$I_F = f(V_F)$



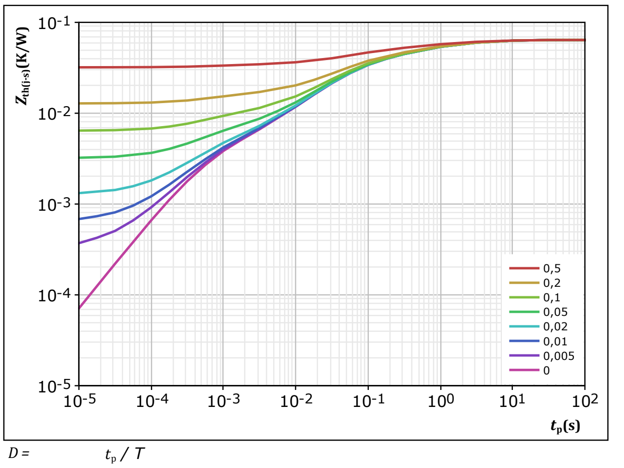
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 18. FWD

Transient thermal impedance as a function of pulse width

$Z_{th(j-s)} = f(t_p)$



$D = t_p / T$

$R_{th(j-s)}$ = 0,064 K/W

FWD thermal model values

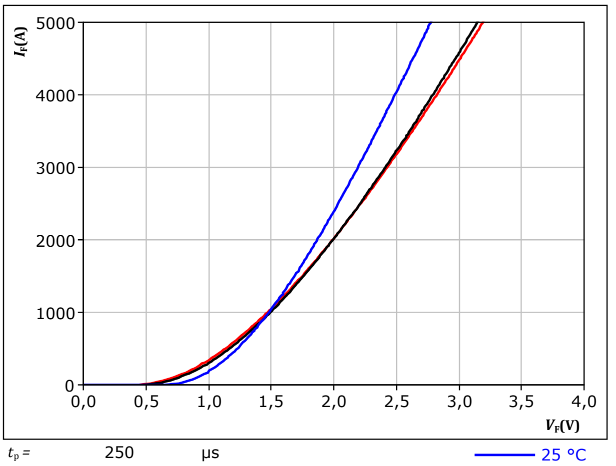
R (K/W)	τ (s)
5,82E-03	5,72E+00
1,11E-02	1,19E+00
1,42E-02	3,03E-01
1,84E-02	6,32E-02
9,64E-03	2,04E-02
2,07E-03	2,67E-03
2,77E-03	5,00E-04

Boost Sw. Inv. Diode Characteristics

figure 19. FWD

Typical forward characteristics

$I_F = f(V_F)$



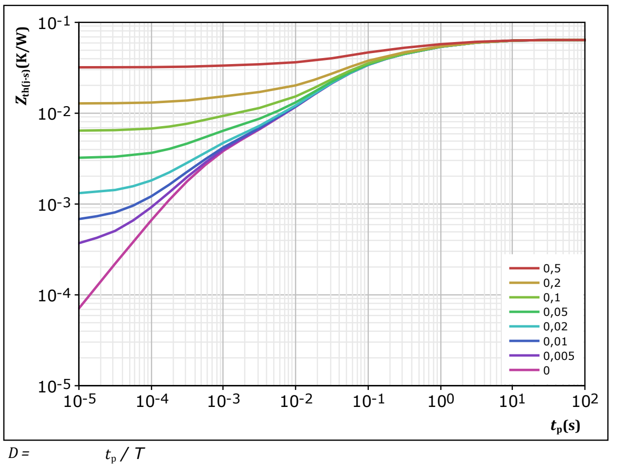
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 20. FWD

Transient thermal impedance as a function of pulse width

$Z_{th(j\text{-}s)} = f(t_p)$



D = t_p / T

$R_{th(j\text{-}s)}$ = 0,064 K/W

FWD thermal model values

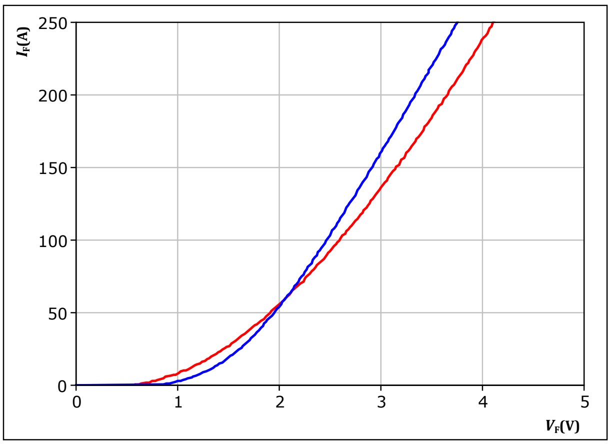
R (K/W)	τ (s)
5,82E-03	5,72E+00
1,11E-02	1,19E+00
1,42E-02	3,03E-01
1,84E-02	6,32E-02
9,64E-03	2,04E-02
2,07E-03	2,67E-03
2,77E-03	5,00E-04

Boost Sw. Protection Diode Characteristics

figure 21. FWD

Typical forward characteristics

$I_F = f(V_F)$



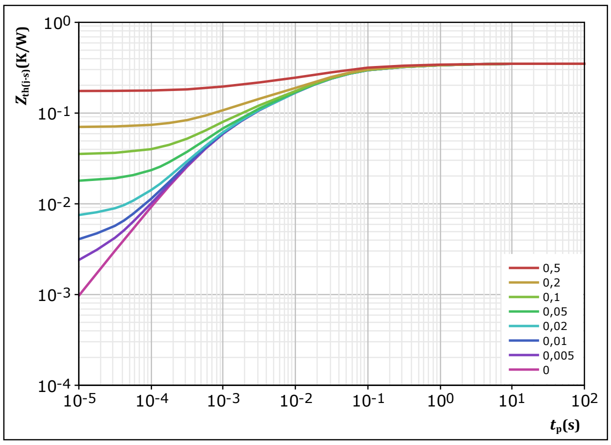
t_p = 250 µs

T_j: 25 °C, 125 °C

figure 22. FWD

Transient thermal impedance as a function of pulse width

$Z_{th(j-s)} = f(t_p)$



D = t_p / T

$R_{th(j-s)}$ = 0,35 K/W

FWD thermal model values

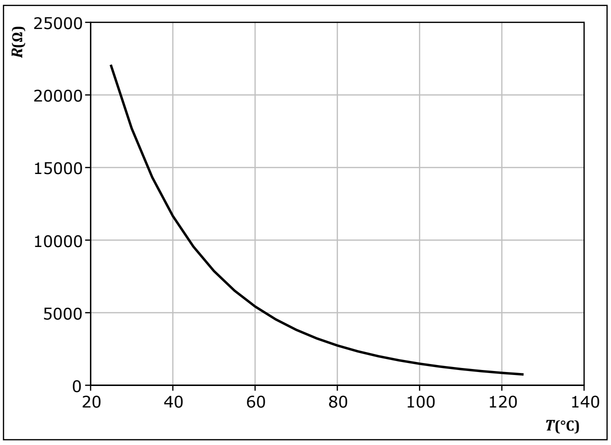
R (K/W)	τ (s)
1,65E-02	2,62E+00
3,35E-02	3,18E-01
8,98E-02	5,01E-02
1,07E-01	1,62E-02
6,29E-02	2,76E-03
2,24E-02	7,41E-04
1,78E-02	4,89E-04

Thermistor Characteristics

figure 23. **Thermistor**

Typical NTC characteristic as function of temperature

R_T = f(T)

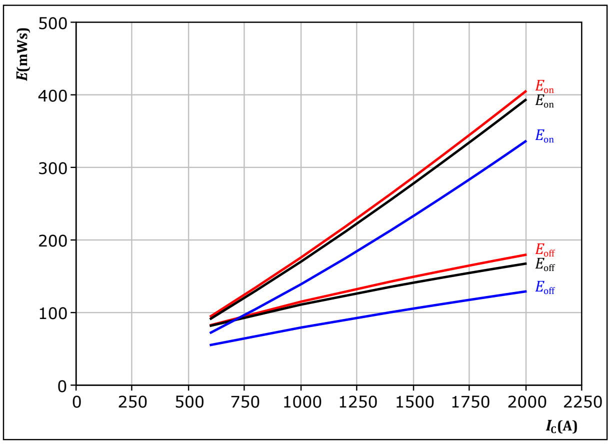


Buck Switching Characteristics

figure 24. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



With an inductive load at

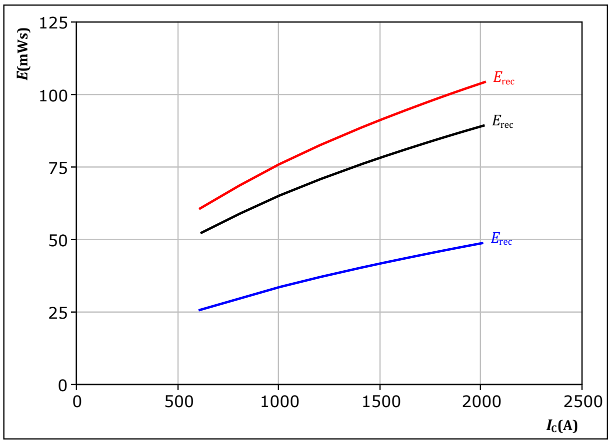
V_{CE} =	600	V	
V_{GE} =	-8/16	V	
R_{gon} =	0,5	Ω	
R_{goff} =	0,5	Ω	

T_j: 25 °C, 125 °C, 150 °C

figure 25. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



With an inductive load at

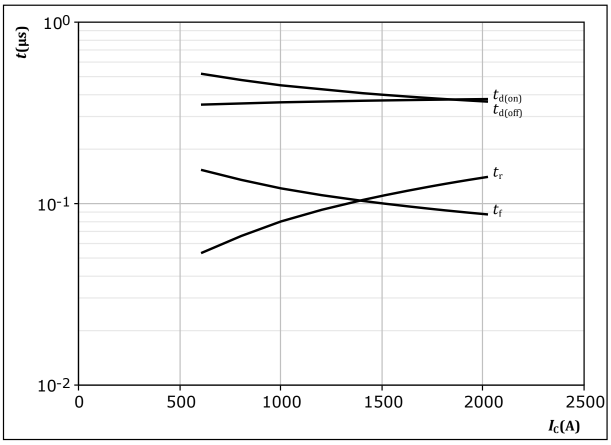
V_{CE} =	600	V
V_{GE} =	-8/16	V
R_{gon} =	0,5	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 26. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



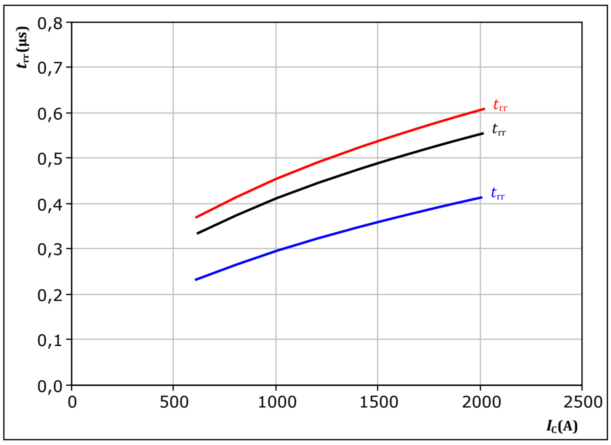
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	-8/16	V
R_{gon} =	0,5	Ω
R_{goff} =	0,5	Ω

figure 27. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

V_{CE} =	600	V
V_{GE} =	-8/16	V
R_{gon} =	0,5	Ω

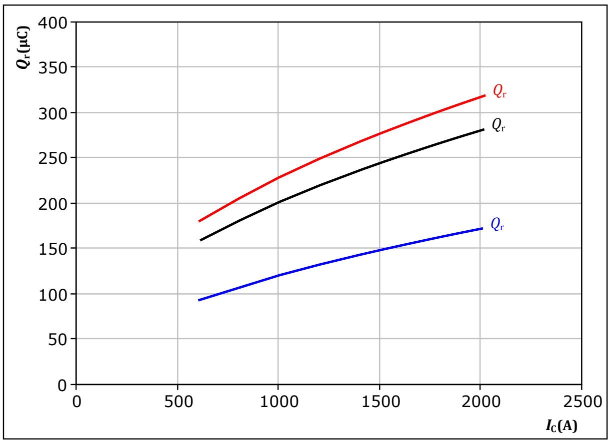
T_j: 25 °C, 125 °C, 150 °C

Buck Switching Characteristics

figure 28. **FWD**

Typical recovered charge as a function of collector current

$Q_r = f(I_C)$



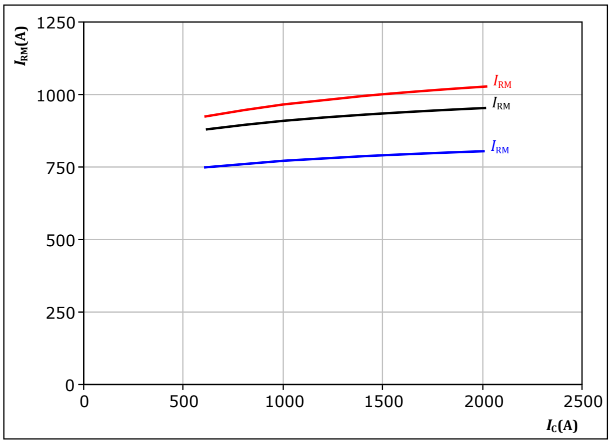
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,5	Ω		150 °C

figure 29. **FWD**

Typical peak reverse recovery current as a function of collector current

$I_{RM} = f(I_C)$



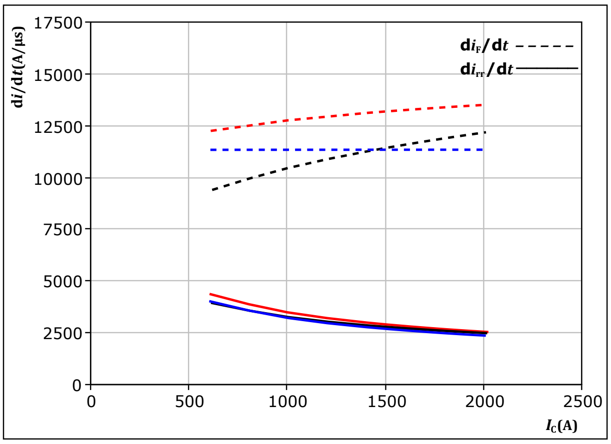
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,5	Ω		150 °C

figure 30. **FWD**

Typical rate of fall of forward and reverse recovery current as a function of collector current

di_F/dt, $di_{rr}/dt = f(I_C)$



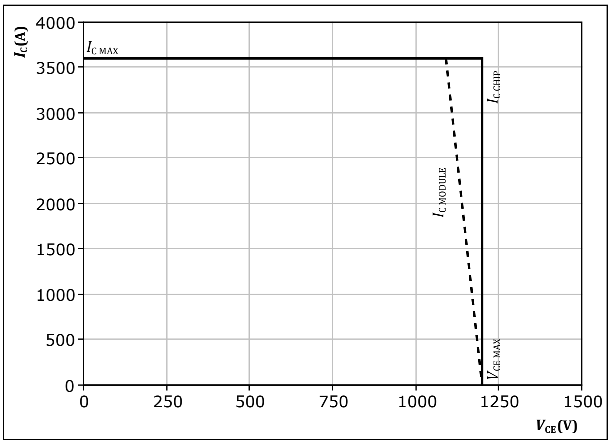
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,5	Ω		150 °C

figure 31. **IGBT**

Reverse bias safe operating area

$I_C = f(V_{CE})$



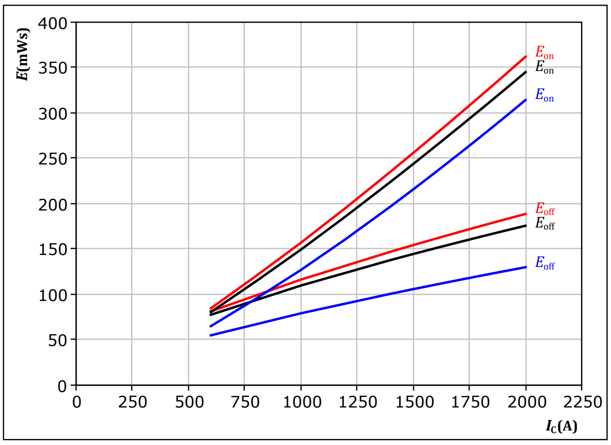
At	T_j =	150	°C
	R_{gon} =	0,5	Ω
	R_{goff} =	0,5	Ω

Boost Switching Characteristics

figure 32. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



With an inductive load at

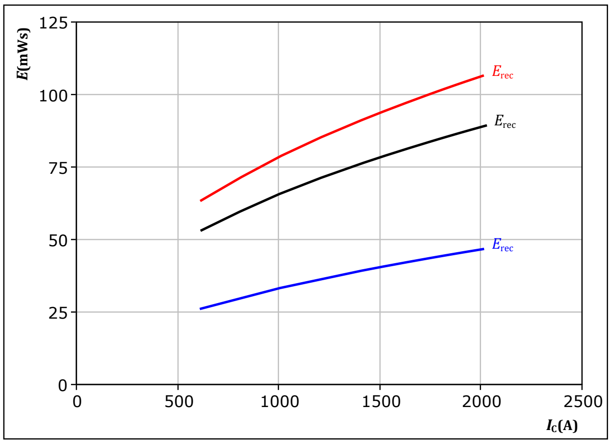
V_{CE} =	600	V
V_{GE} =	-8/16	V
R_{gon} =	0,5	Ω
R_{goff} =	0,5	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 33. **FWD**

Typical reverse recovered energy loss as a function of collector current

E_{rec} = f(I_C)



With an inductive load at

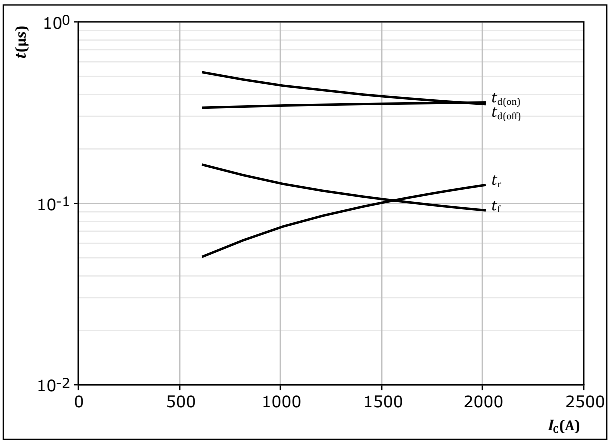
V_{CE} =	600	V
V_{GE} =	-8/16	V
R_{gon} =	0,5	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 34. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



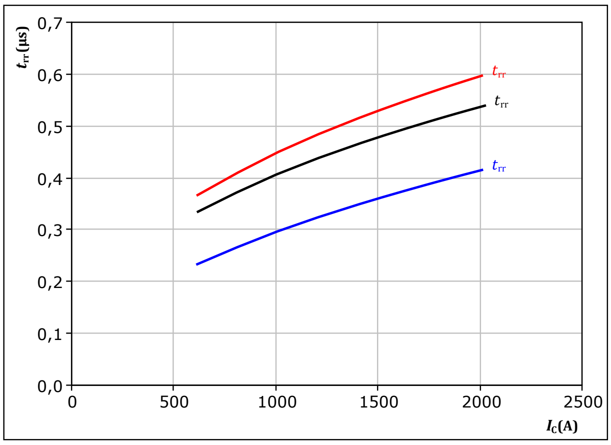
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	-8/16	V
R_{gon} =	0,5	Ω
R_{goff} =	0,5	Ω

figure 35. **FWD**

Typical reverse recovery time as a function of collector current

t_{rr} = f(I_C)



With an inductive load at

V_{CE} =	600	V
V_{GE} =	-8/16	V
R_{gon} =	0,5	Ω

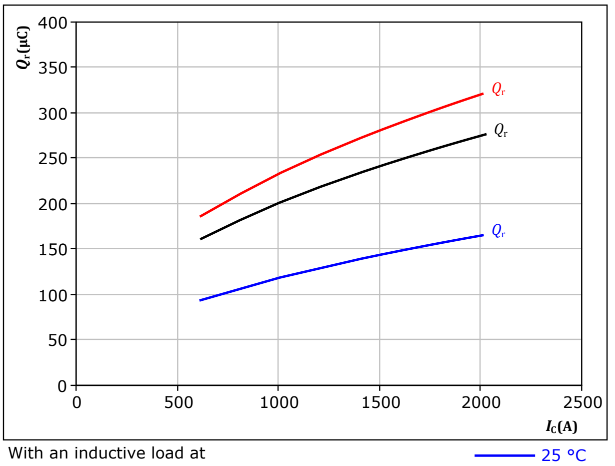
T_j: 25 °C, 125 °C, 150 °C

Boost Switching Characteristics

figure 36. **FWD**

Typical recovered charge as a function of collector current

Q_r = f(I_C)



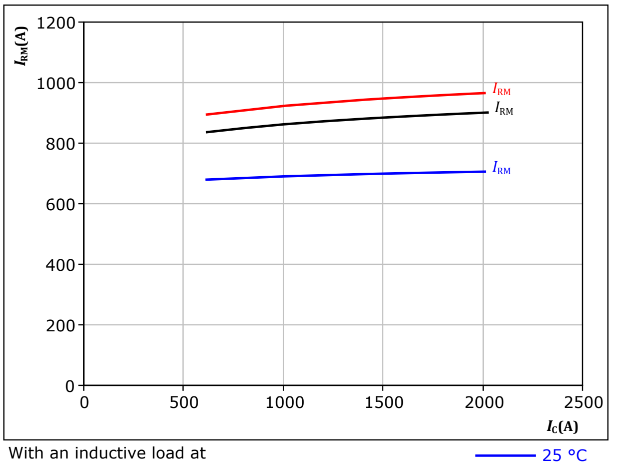
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,5	Ω		150 °C

figure 37. **FWD**

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



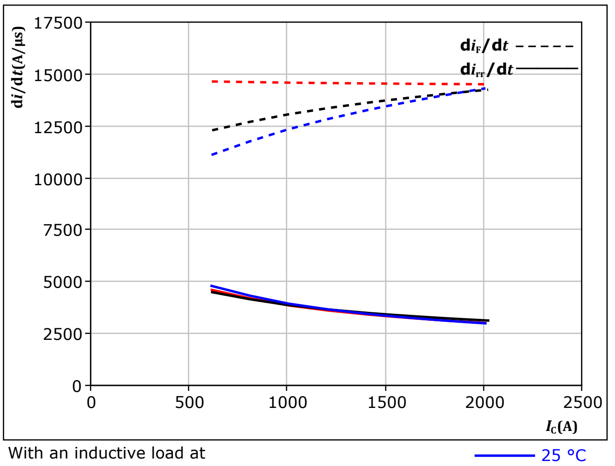
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,5	Ω		150 °C

figure 38. **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)



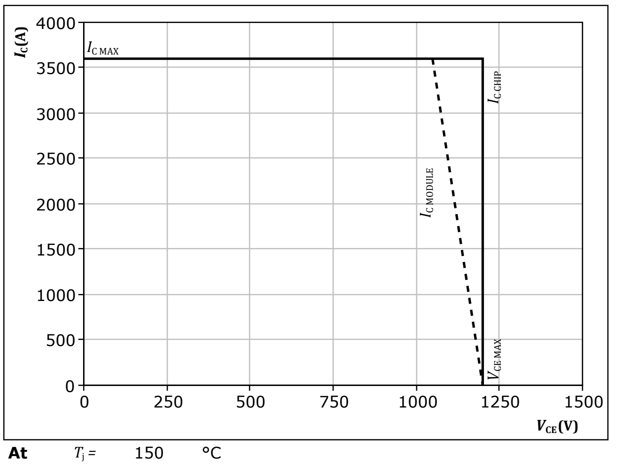
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,5	Ω		150 °C

figure 39. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



At	T_j =	150	°C
	R_{gon} =	0,5	Ω
	R_{goff} =	0,5	Ω

Switching Definitions

figure 40. **IGBT**

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

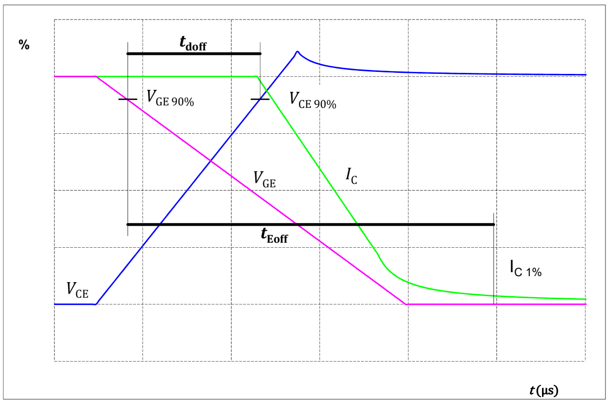


figure 41. **IGBT**

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

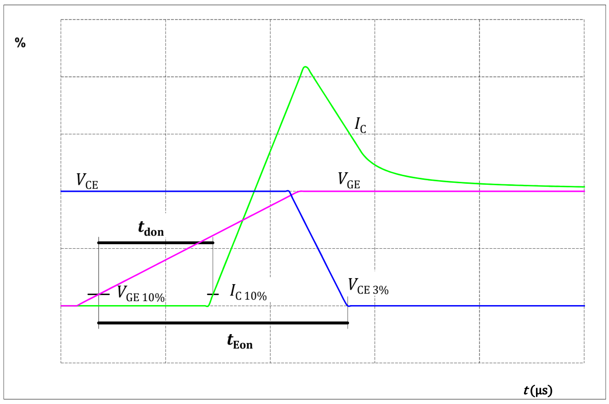


figure 42. **IGBT**

Turn-off Switching Waveforms & definition of t_f

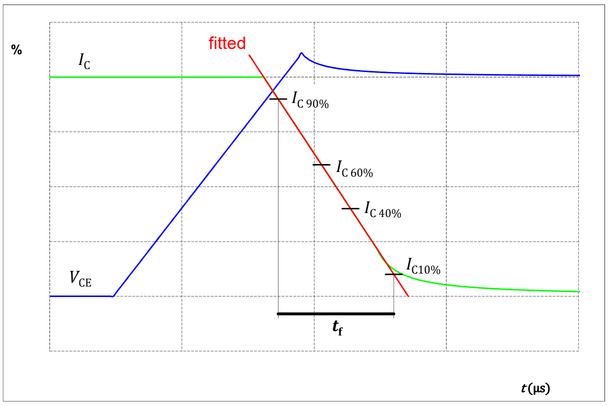
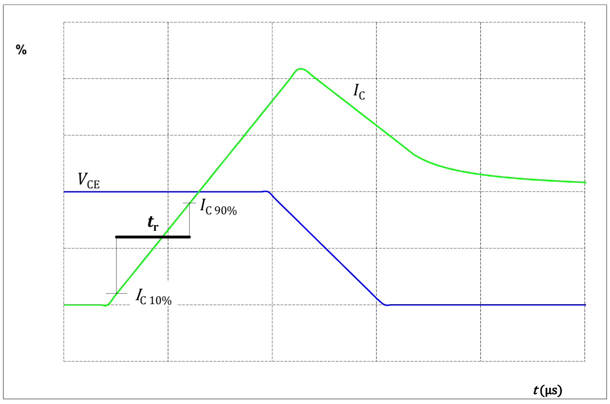


figure 43. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 44. **FWD**

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

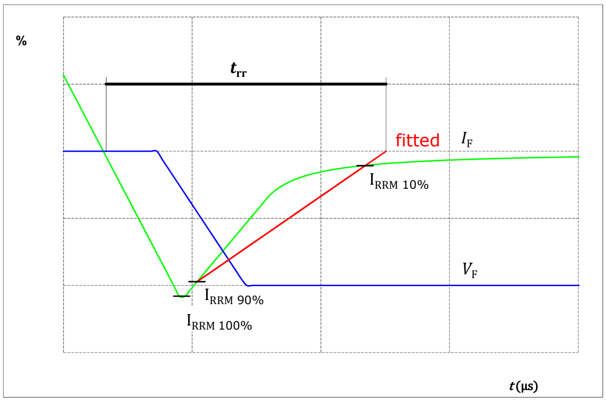
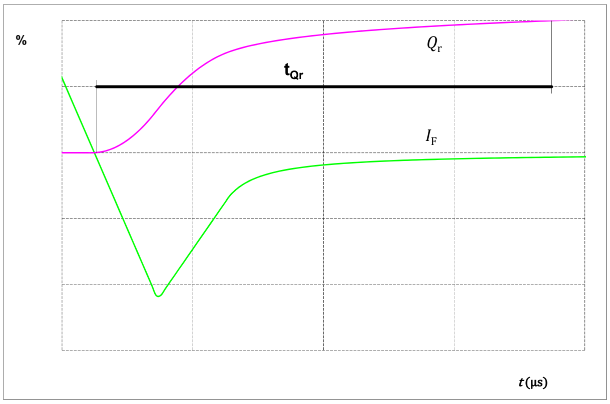


figure 45. **FWD**

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



Vincotech

70-W624NIA1K8M701-LD00FP70

target datasheet

Ordering Code

Version	Ordering Code
Without thermal paste	70-W624NIA1K8M701-LD00FP70
With thermal paste (3,4 W/mK, PSX-P7)	70-W624NIA1K8M701-LD00FP70-/3/

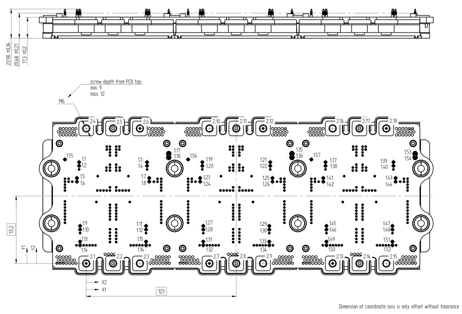
Marking

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

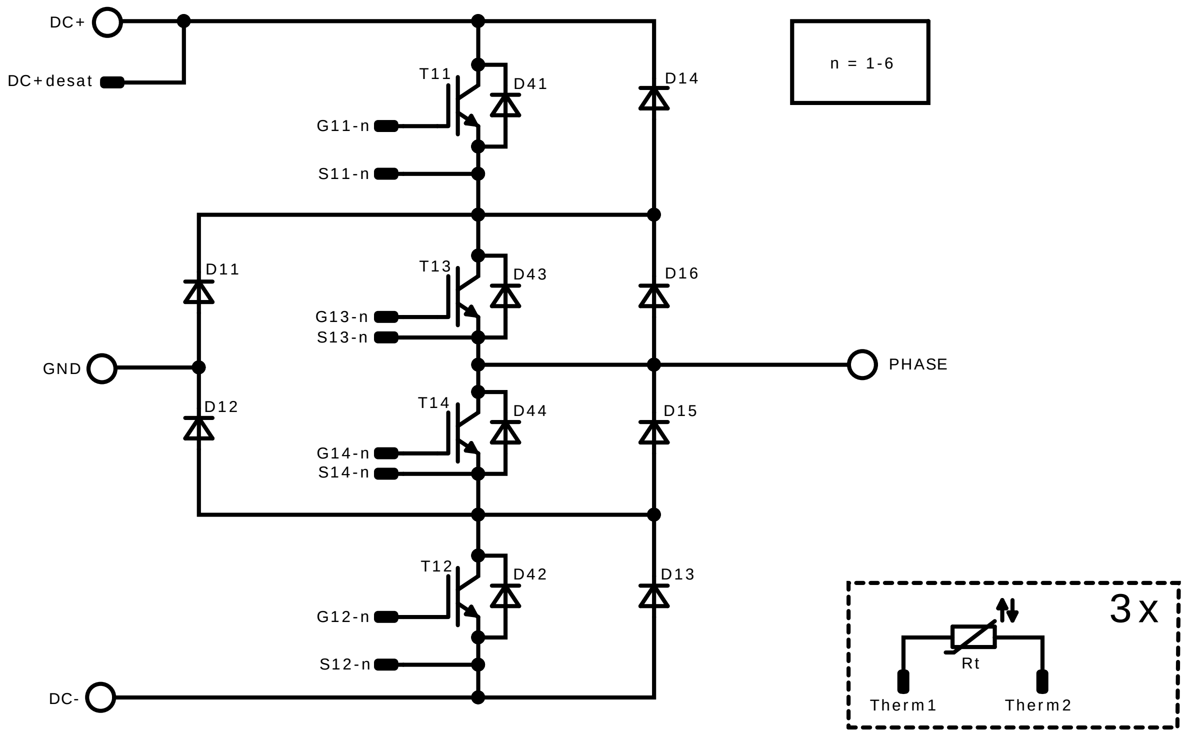
Outline

Pin table [mm]

Pin	X	Y	Function	30	150,05	27,7	S14-4
1	-5,85	82,8	G11-1	31	95,95	17,85	G12-3
2	-5,85	79,8	S11-1	32	95,95	14,85	S12-3
3	49,85	82,8	G11-2	33	150,05	17,85	G12-4
4	49,85	79,8	S11-2	34	150,05	14,85	S12-4
5	-7,65	69,85	G13-1	35	168,65	89,8	Therm1
6	-7,65	66,85	S13-1	36	168,65	86,7	Therm2
7	51,65	69,85	G13-2	37	196,15	82,8	G11-5
8	51,65	66,85	S13-2	38	196,15	79,8	S11-5
9	-5,05	30,7	G14-1	39	251,85	82,8	G11-6
10	-5,05	27,7	S14-1	40	251,85	79,8	S11-6
11	49,05	30,7	G14-2	41	194,35	69,85	G13-5
12	49,05	27,7	S14-2	42	194,35	66,85	S13-5
13	-5,05	17,85	G12-1	43	253,65	69,85	G13-6
14	-5,05	14,85	S12-1	44	253,65	66,85	S13-6
15	49,05	17,85	G12-2	45	196,95	30,7	G14-5
16	49,05	14,85	S12-2	46	196,95	27,7	S14-5
17	67,65	89,8	Therm1	47	251,05	30,7	G14-6
18	67,65	86,7	Therm2	48	251,05	27,7	S14-6
19	95,15	82,8	G11-3	49	196,95	17,85	G12-5
20	95,15	79,8	S11-3	50	196,95	14,85	S12-5
21	150,85	82,8	G11-4	51	251,05	17,85	G12-6
22	150,85	79,8	S11-4	52	251,05	14,85	S12-6
23	93,35	69,85	G13-3	53	269,65	89,8	Therm1
24	93,35	66,85	S13-3	54	269,65	86,7	Therm2
25	152,65	69,85	G13-4	55	-17,45	85	DESAT
26	152,65	66,85	S13-4	56	83,55	85	DESAT
27	95,95	30,7	G14-3	57	184,55	85	DESAT
28	95,95	27,7	S14-3				
29	150,05	30,7	G14-4				



Pinout



NOTE: Driver pins for parallel devices are not connected inside the module!

Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12	IGBT	1200 V	1800 A	Buck Switch	
D11, D12	FWD	1200 V	1800 A	Buck Diode	
D41, D42	FWD	1200 V	90 A	Buck Sw. Protection Diode	
T13, T14	IGBT	1200 V	1800 A	Boost Switch	
D13, D14	FWD	1200 V	1800 A	Boost Diode	
D15, D16	FWD	1200 V	1800 A	Boost Sw. Inv. Diode	
D43, D44	FWD	1200 V	90 A	Boost Sw. Protection Diode	
Rt	NTC			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 4	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for VINco X12 packages see vincotech.com website.

Package data
Package data for VINco X12 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 UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,op}$=175°C and up to 4000VAC/1min isolation voltage. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
70-W624NIA1K8M701-LD00FP70-T2-14	10 May. 2024		

Product status definition		
Datasheet Status	**Product Status**	**Definition**
Target	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. The data contained is exclusively intended for technically trained staff.