



Vincotech

A0-VP122PA600RA-L759F80T

datasheet

VINcoDUAL E3

1200 V / 600 A

Topology features

- Temperature sensor
- Half Bridge

Component features

- Easy paralleling
- Low collector emitter saturation voltage
- Low turn-off losses

Housing features

- Base isolation: IMB
- SoLid Cover Technology
- Standard mid-power industry package
- Driver pins are available in press-fit and solder pin
- M6 High Power Screw Contact
- Reliable cold welding connection to PCB
- Press-fit terminals

Target applications

- Industrial Drives

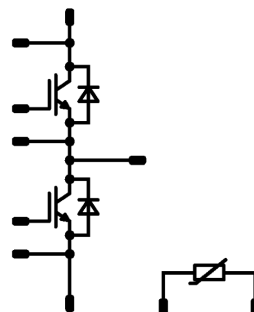
Types

- A0-VP122PA600RA-L759F80T

VINco E3s 17 mm housing



Schematic





Vincotech

A0-VP122PA600RA-L759F80T
datasheet

Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Half-Bridge Switch				
Collector-emitter voltage	V_{CES}		1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	568	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	1800	A
Turn off safe operating area		$T_j = 150\text{ °C}$, $V_{CE} = 1200\text{ V}$	1800	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	956	W
Gate-emitter voltage	V_{GES}		± 30	V
Short circuit ratings	t_{SC}	$V_{GE} = 15\text{ V}$, $V_{CC} = 800\text{ V}$ $T_j = 150\text{ °C}$	8	μs
Maximum junction temperature	T_{jmax}		175	$^{\circ}\text{C}$

Half-Bridge Diode

Peak repetitive reverse voltage	V_{RRM}		1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	466	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	1800	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	747	W
Maximum junction temperature	T_{jmax}		175	$^{\circ}\text{C}$

Module Properties

Thermal Properties

Storage temperature	T_{stg}		-40...+125	$^{\circ}\text{C}$
Operation temperature under switching condition	T_{jop}		-40...+($T_{jmax} - 25$)	$^{\circ}\text{C}$

Isolation Properties

Isolation voltage	V_{isol}	DC Test Voltage* $t_p = 2\text{ s}$	6000	V
Creepage distance			16,2	mm
Clearance			18,1	mm
Comparative Tracking Index	CTI		≥ 200	

*100 % tested in production



Vincotech

A0-VP122PA600RA-L759F80T

datasheet

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	

Half-Bridge Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$			5	0,0708	25	5,5	6,3	7,1	V
Collector-emitter saturation voltage	V_{CEsat}		15		600	25 125 150		1,33 1,58 1,65	1,95 ⁽¹⁾	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			30	µA
Gate-emitter leakage current	I_{GES}		30	0		25			1500	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	$f = 1 \text{ Mhz}$	0	30		25		99594		pF
Output capacitance	C_{oes}							2259		pF
Reverse transfer capacitance	C_{res}							834		pF
Gate charge	Q_g		0/15	600	600	25		3615		nC

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 3,4 \text{ W/mK}$ (PSX)						0,1		K/W
--	---------------	---	--	--	--	--	--	-----	--	-----

Dynamic

Turn-on delay time	$t_{d(on)}$	$R_{gon} = 5,82 \Omega$ $R_{goff} = 5,82 \Omega$	-5/15	600	600	25 125 150		648,19 628,71 621,05		ns
Rise time	t_r					25 125 150		169,8 206,11 215,76		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		1269,08 1304,77 1314,99		ns
Fall time	t_f					25 125 150		89,43 111,54 113,23		ns
Turn-on energy (per pulse)	E_{on}					25 125 150		100,03 136,88 149,09		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		69,1 85,22 90,99		mWs



Vincotech

A0-VP122PA600RA-L759F80T

datasheet

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	

Half-Bridge Diode

Static

Forward voltage	V_F				600	25 125 150		1,53 1,71 1,72	2,1 ⁽¹⁾	V
Reverse leakage current	I_R	$V_i = 1200$ V				25			30	μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						0,13		K/W
--	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

Dynamic

Peak recovery current	I_{RM}	$di/dt=3404$ A/μs $di/dt=2784$ A/μs $di/dt=2390$ A/μs	-5/15	600	600	25 125 150		196,86 221,74 234,23		A
Reverse recovery time	t_{rr}					25 125 150		438,57 708,8 776,91		ns
Recovered charge	Q_r					25 125 150		33,86 67,52 79,88		μC
Reverse recovered energy	E_{rec}					25 125 150		8,63 19,05 22,82		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		1382,38 538,28 485,71		A/μs



Vincotech

A0-VP122PA600RA-L759F80T
datasheet

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		5		k Ω
Deviation of R100	$\Delta_{R/R}$	$R_{100} = 493 \Omega$				100	-5		5	%
Power dissipation	P							245		mW
Power dissipation constant	d					25		1,4		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 2 \%$						3375		K
B-value	$B_{(25/100)}$	Tol. $\pm 2 \%$						3437		K
Vincotech Thermistor Reference									K	

⁽¹⁾ Value at chip level

⁽²⁾ Only valid with pre-applied Vincotech thermal interface material.



Vincotech

A0-VP122PA600RA-L759F80T

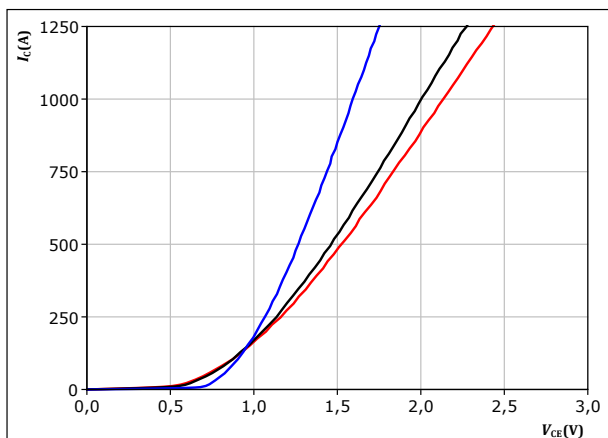
datasheet

Half-Bridge Switch Characteristics

figure 1. IGBT

Typical output characteristics

$$I_C = f(V_{CE})$$



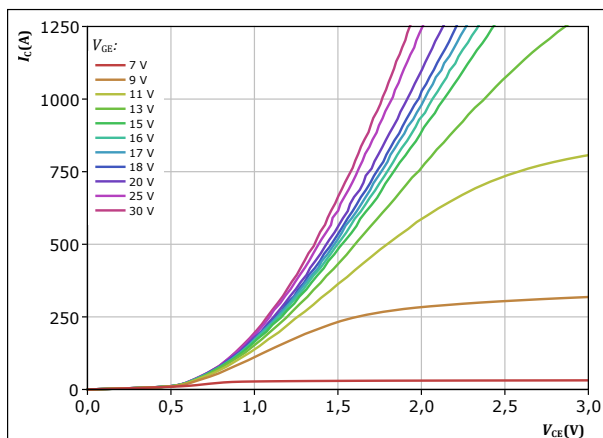
$t_p = 250 \mu s$
 $V_{GE} = 15 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 2. IGBT

Typical output characteristics

$$I_C = f(V_{CE})$$

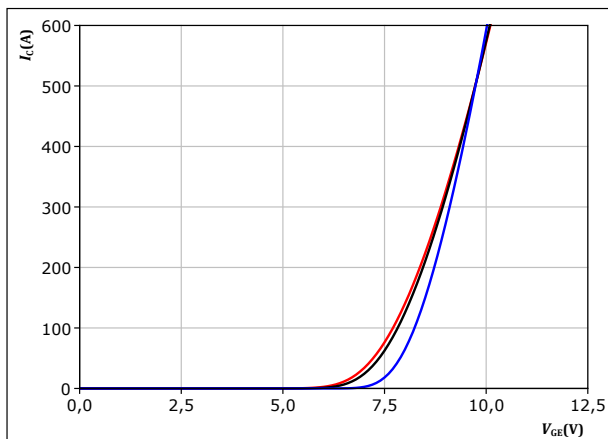


$t_p = 250 \mu s$
 $T_j = 150 ^\circ C$
 V_{GE} from 7 V to 30 V in steps of 2 V

figure 3. IGBT

Typical transfer characteristics

$$I_C = f(V_{GE})$$



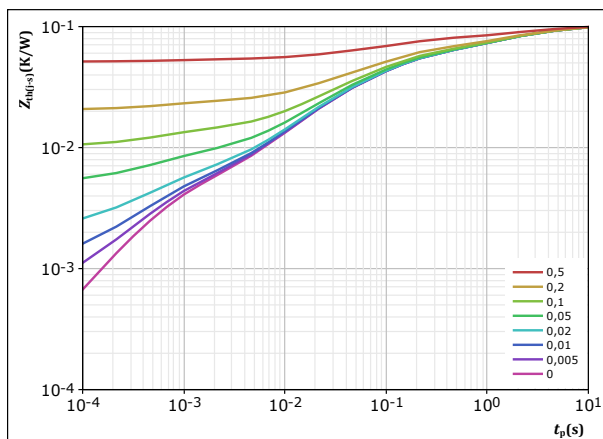
$t_p = 250 \mu s$
 $V_{CE} = 30 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 4. IGBT

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$
 $R_{th(j-s)} = 0,099 K/W$
IGBT thermal model values

$R (K/W)$	$\tau (s)$
2,22E-02	5,62E+00
2,72E-02	1,09E+00
3,46E-02	1,03E-01
1,50E-02	1,91E-02
3,67E-03	6,09E-04



Vincotech

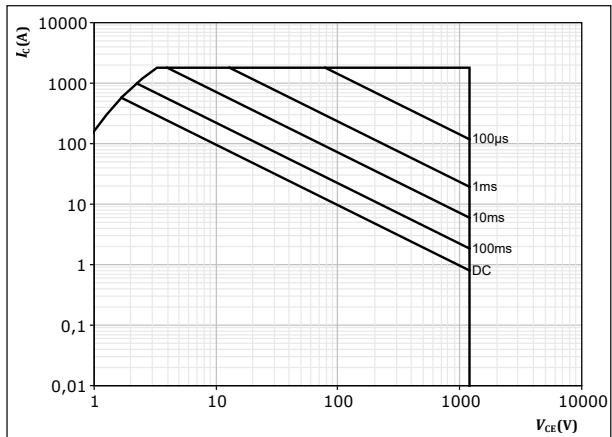
A0-VP122PA600RA-L759F80T
datasheet

Half-Bridge Switch Characteristics

figure 5. IGBT

Safe operating area

$$I_C = f(V_{CE})$$



D = single pulse

$T_s = 80$ °C

$V_{GE} = 15$ V

$T_j = T_{jmax}$



Vincotech

A0-VP122PA600RA-L759F80T

datasheet

Half-Bridge Diode Characteristics

figure 6. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

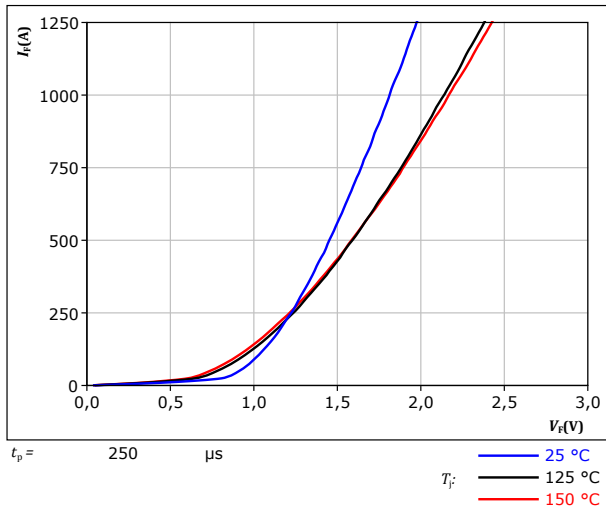
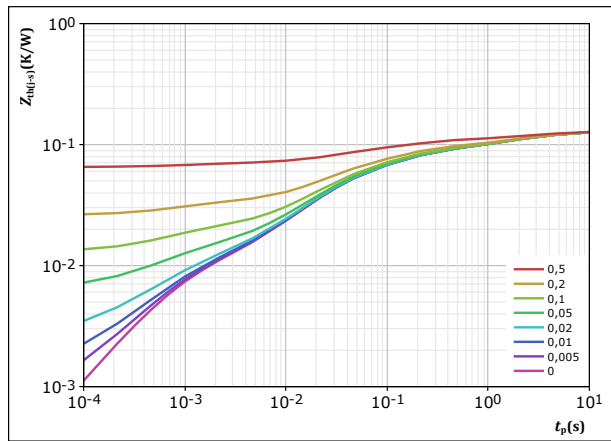


figure 7. FWD

Transient thermal impedance as a function of pulse width

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



$D =$	t_p / T
$R_{th(j-s)} =$	0,127 K/W
FWD thermal model values	
R (K/W)	τ (s)
1,84E-02	6,38E+00
2,80E-02	1,35E+00
4,01E-02	1,22E-01
3,64E-02	2,34E-02
7,49E-03	7,55E-04



Vincotech

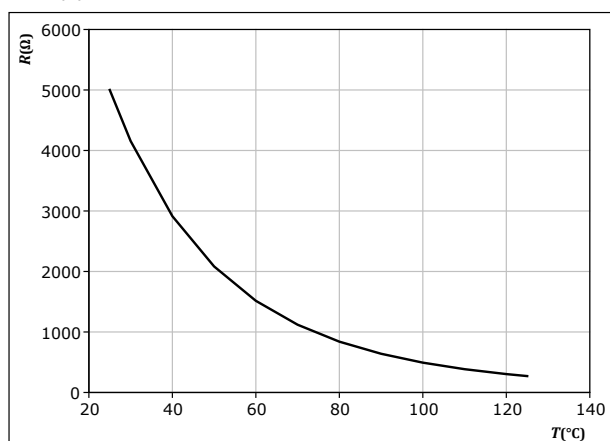
A0-VP122PA600RA-L759F80T
datasheet

Thermistor Characteristics

figure 8. Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





Vincotech

A0-VP122PA600RA-L759F80T datasheet

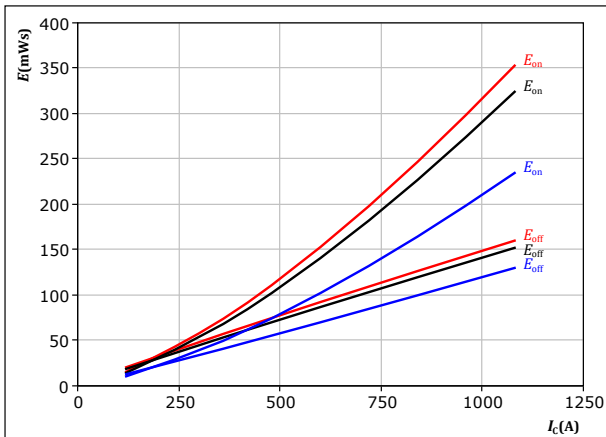
Half-Bridge Switching Characteristics

figure 9.

IGBT

Typical switching energy losses as a function of collector current

$$E = f(I_C)$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = -5/15 \text{ V}$
 $R_{gon} = 5,82 \text{ } \Omega$
 $R_{goff} = 5,82 \text{ } \Omega$

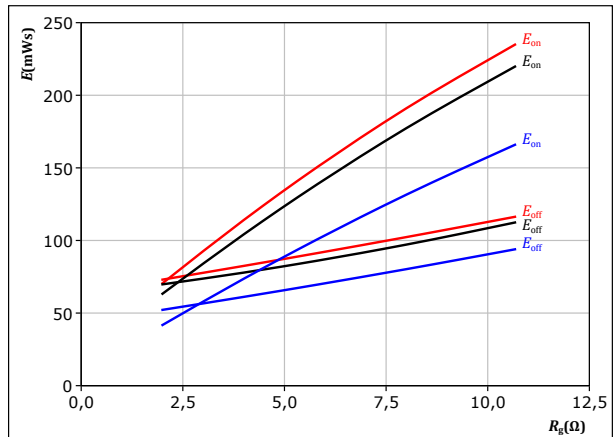
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 10.

IGBT

Typical switching energy losses as a function of IGBT turn on gate resistor

$$E = f(R_g)$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = -5/15 \text{ V}$
 $I_C = 600 \text{ A}$

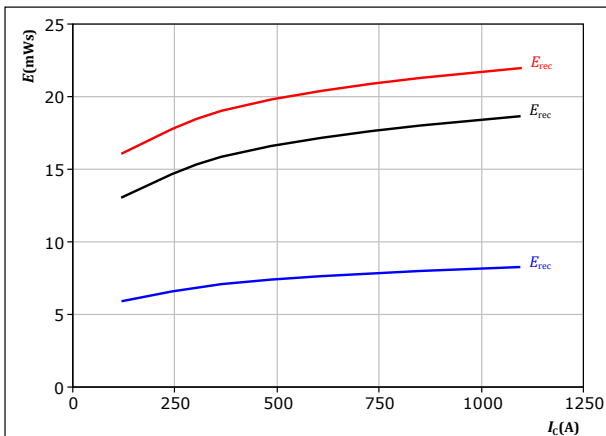
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 11.

FWD

Typical reverse recovered energy loss as a function of collector current

$$E_{rec} = f(I_C)$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = -5/15 \text{ V}$
 $R_{gon} = 5,82 \text{ } \Omega$

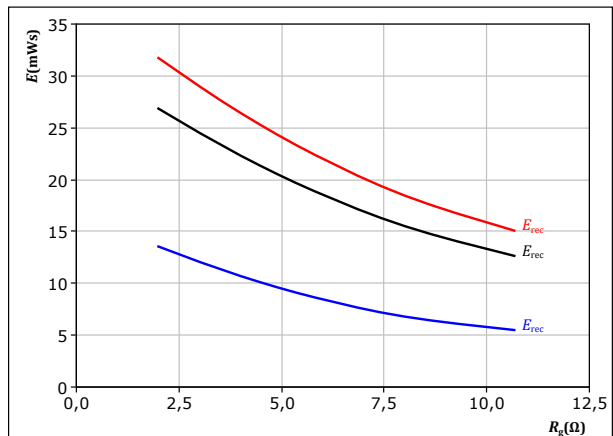
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 12.

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

$V_{CE} = 600 \text{ V}$
 $V_{GE} = -5/15 \text{ V}$
 $I_C = 600 \text{ A}$

T_j :
— 25 °C
— 125 °C
— 150 °C



Vincotech

A0-VP122PA600RA-L759F80T

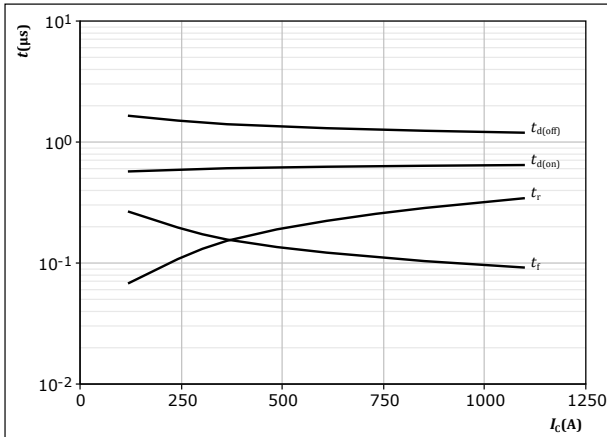
datasheet

Half-Bridge Switching Characteristics

figure 13.

IGBT

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



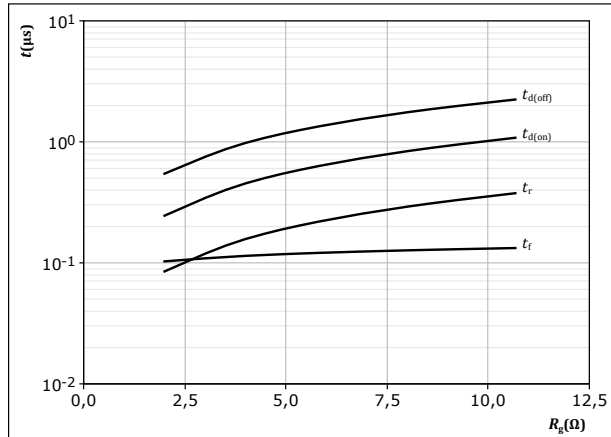
With an inductive load at

$T_j = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $R_{gon} = 5,82$ Ω
 $R_{goff} = 5,82$ Ω

figure 14.

IGBT

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



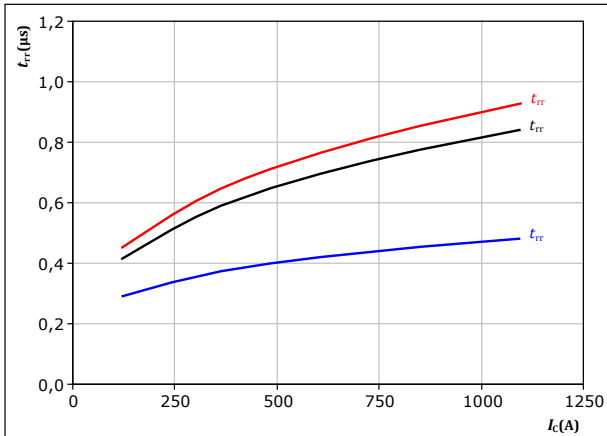
With an inductive load at

$T_j = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $I_c = 600$ A

figure 15.

FWD

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



With an inductive load at

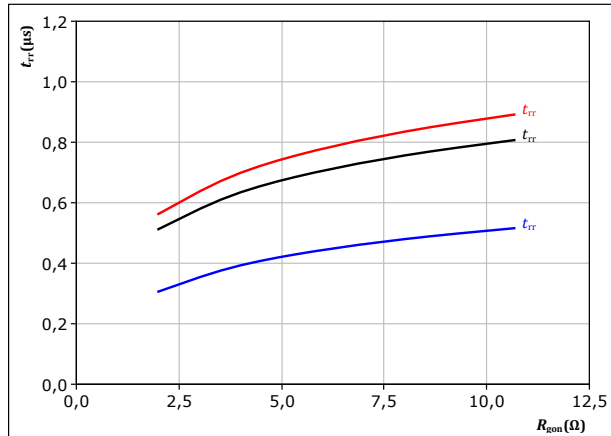
$V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $R_{gon} = 5,82$ Ω

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

figure 16.

FWD

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $I_c = 600$ A

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



Vincotech

A0-VP122PA600RA-L759F80T
datasheet

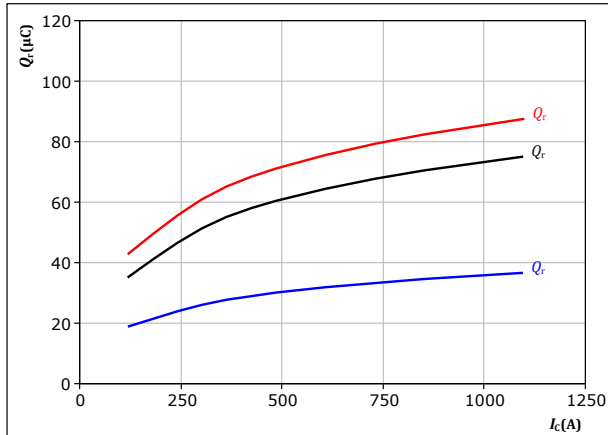
Half-Bridge Switching Characteristics

figure 17.

FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $R_{gon} = 5,82$ Ω

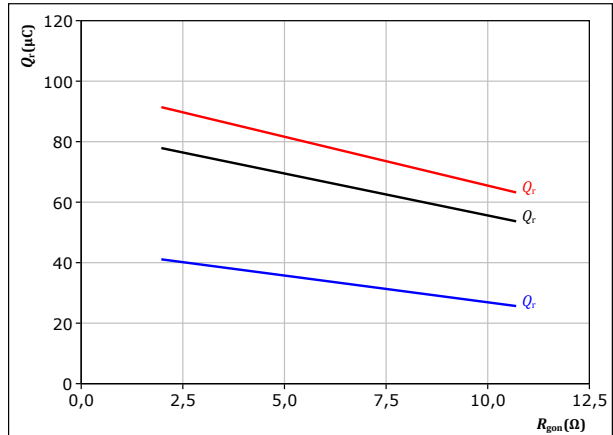
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 18.

FWD

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

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $I_c = 600$ A

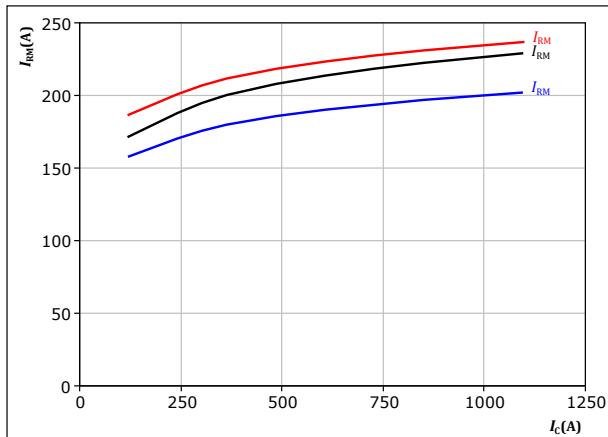
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 19.

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
 $V_{GE} = -5/15$ V
 $R_{gon} = 5,82$ Ω

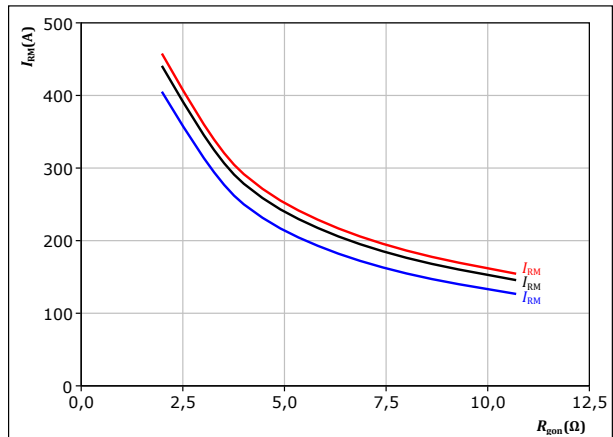
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 20.

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

$V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $I_c = 600$ A

T_j :
— 25 °C
— 125 °C
— 150 °C



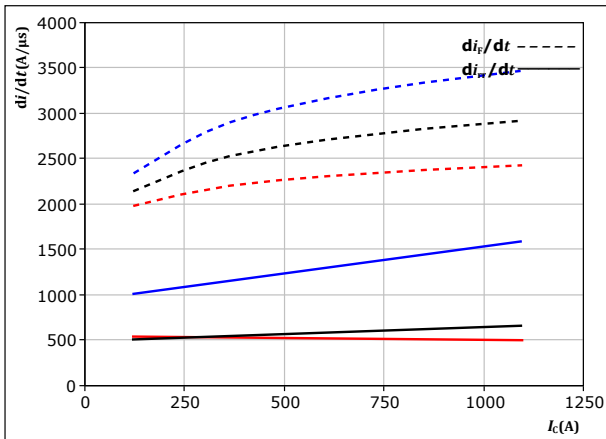
Vincotech

A0-VP122PA600RA-L759F80T
datasheet

Half-Bridge Switching Characteristics

figure 21. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_f/dt, di_r/dt = f(I_C)$



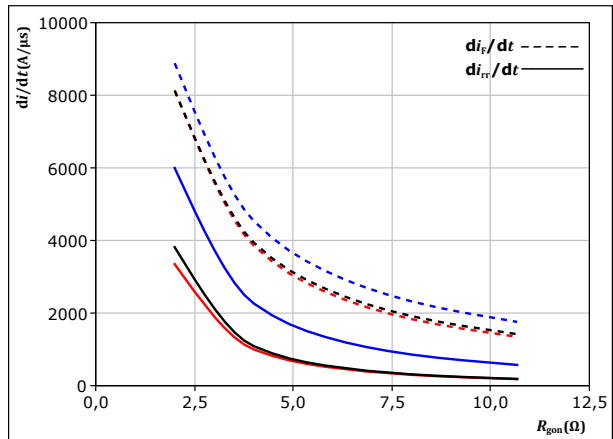
With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $R_{gon} = 5,82$ Ω

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 22. FWD

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



With an inductive load at

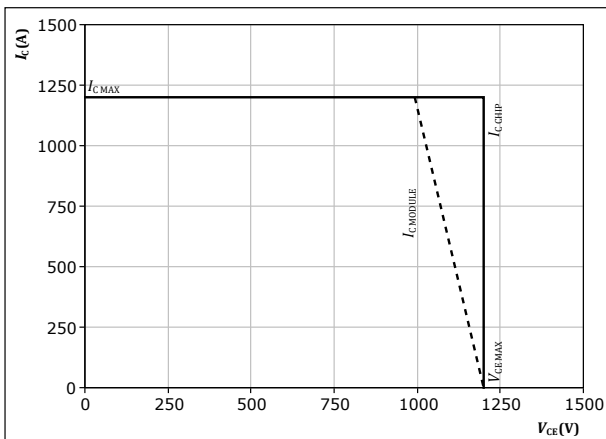
$V_{CE} = 600$ V
 $V_{GE} = -5/15$ V
 $I_C = 600$ A

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 23. IGBT

Reverse bias safe operating area

$I_C = f(V_{CE})$



At $T_j = 150$ °C
 $R_{gon} = 5,82$ Ω
 $R_{goff} = 5,82$ Ω



Vincotech

Half-Bridge Switching Definitions

figure 24. IGBT

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

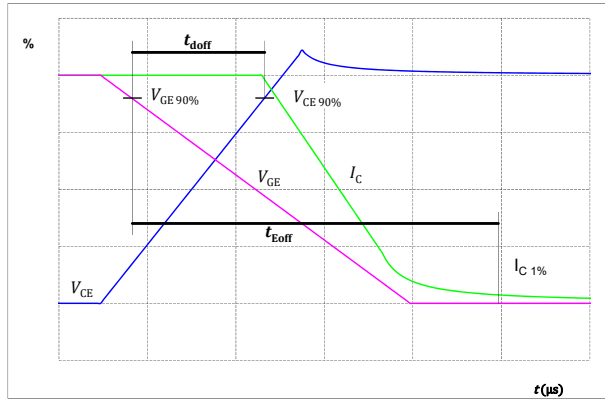


figure 25. IGBT

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

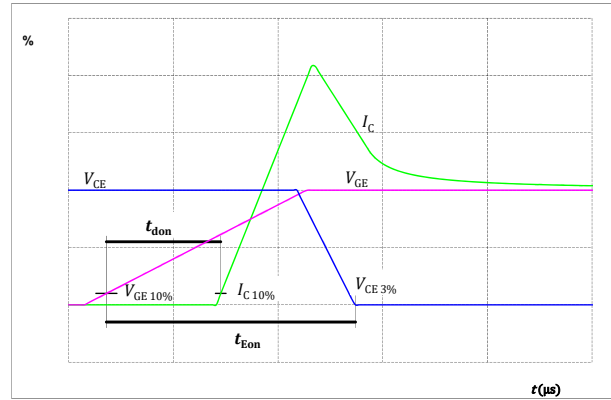


figure 26. IGBT

Turn-off Switching Waveforms & definition of t_f

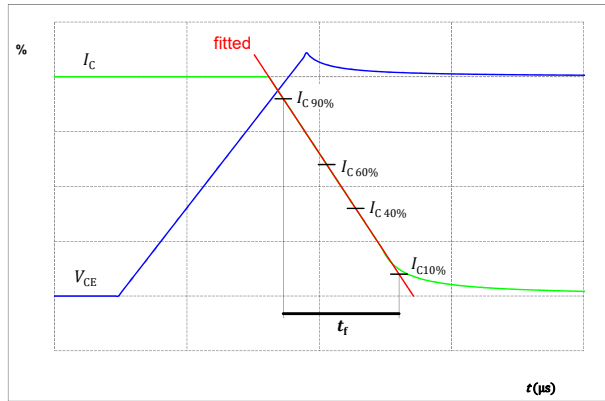
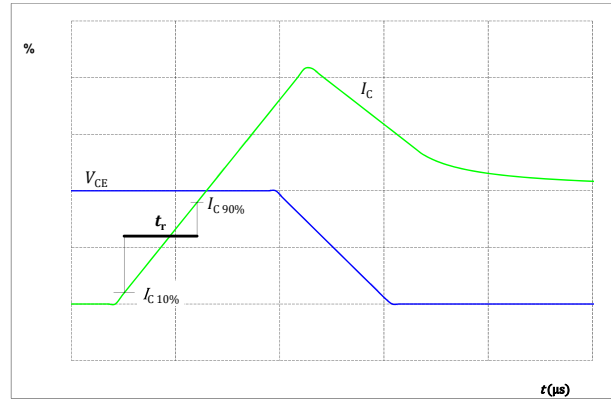


figure 27. IGBT

Turn-on Switching Waveforms & definition of t_r





Vincotech

Half-Bridge Switching Definitions

figure 28. FWD

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

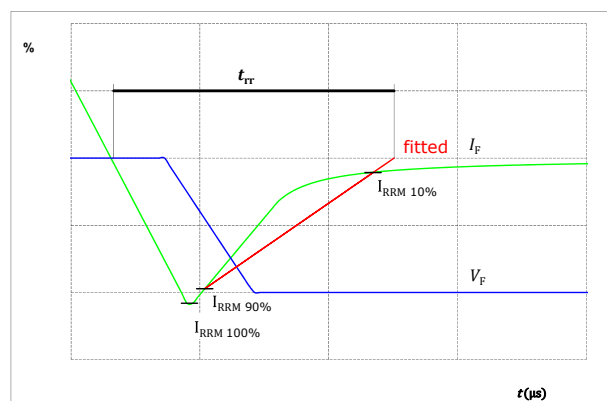
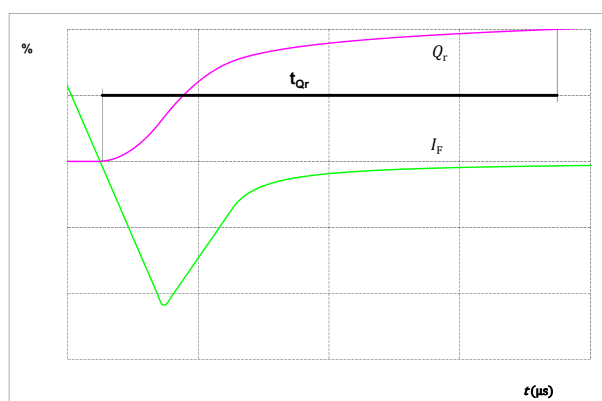


figure 29. FWD

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






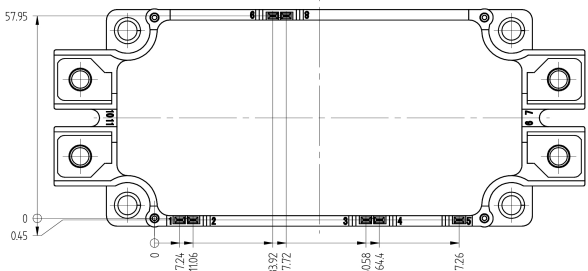
Vincotech

A0-VP122PA600RA-L759F80T

datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	A0-VP122PA600RA-L759F80T
With thermal paste (5,2 W/mK, PTM6000HV)	A0-VP122PA600RA-L759F80T-/7/

Marking						
	Text	Name	VIN	Date code	Lot	Serial
		NN-NNNNNNNNNNNNNNNN- TTTT TTVV	VIN	WWYY	LLLLL	SSSS
	Datamatrix	Type&Ver	Lot number	Serial	Date code	
		TTTTTTTVV	LLLLL	SSSS	WWYY	

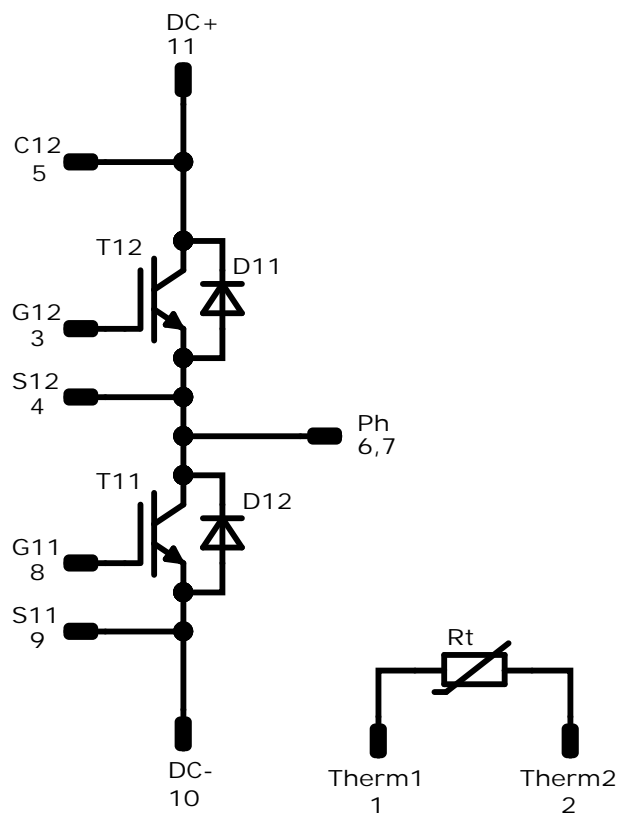
Outline				
Pin table [mm]				
Pin	X	Y	Function	
1	7,24	-0,45	Therm1	
2	11,06	-0,45	Therm2	
3	60,58	-0,45	G12	
4	64,4	-0,45	S12	
5	87,26	-0,45	C12	
6	-	-	Ph	
7	-	-	Ph	
8	37,72	57,95	G11	
9	33,92	57,95	S11	
10	-	-	DC-	
11	-	-	DC+	



Vincotech

A0-VP122PA600RA-L759F80T
datasheet

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12	IGBT	1200 V	600 A	Half-Bridge Switch	
D11, D12	FWD	1200 V	600 A	Half-Bridge Diode	
Rt	NTC			Thermistor	



Vincotech

A0-VP122PA600RA-L759F80T
datasheet

Packaging instruction				
Standard packaging quantity (SPQ) 24	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for VINco E3s packages see vincotech.com website.

Package data
Package data for VINco E3s packages see vincotech.com website.

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

UL recognition and file number
Certification pending. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
A0-VP122PA600RA-L759F80T-D1-14	12 Jun. 2026	Initial Release	

DISCLAIMER

The information, specifications, procedures, methods and recommendations herein (together "information") are presented by Vincotech to reader in good faith, are believed to be accurate and reliable, but may well be incomplete and/or not applicable to all conditions or situations that may exist or occur. Vincotech reserves the right to make any changes without further notice to any products to improve reliability, function or design. No representation, guarantee or warranty is made to reader as to the accuracy, reliability or completeness of said information or that the application or use of any of the same will avoid hazards, accidents, losses, damages or injury of any kind to persons or property or that the same will not infringe third parties rights or give desired results. It is reader's sole responsibility to test and determine the suitability of the information and the product for reader's intended use.

LIFE SUPPORT POLICY

Vincotech products are not authorised for use as critical components in life support devices or systems without the express written approval of Vincotech.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in labelling can be reasonably expected to result in significant injury to the user.
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.