

# IGBT Power Modules

**INT-A-PAK (34 mm)**



**INT-A-PAK**

**SOT-227**



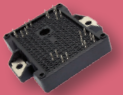
**SOT-227**

**EMIPAK 1B**



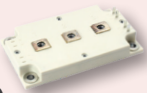
**EMIPAK 1B**

**EMIPAK 2B**



**EMIPAK 2B**

**Dual INT-A-PAK Low Profile**



**DUAL INT-A-PAK LOW PROFILE**

**Dual INT-A-PAK (62 mm)**




**DUAL INT-A-PAK**




# IGBT POWER MODULES

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Single-Switch IGBT Modules											
Package	Device	Type	V <sub>CES</sub> (V)	I <sub>C, nom</sub> (A)	I <sub>C</sub> at T <sub>C</sub>		V <sub>CE(ON)</sub> at 125 °C <sup>(1)</sup> (V)	E <sub>ON</sub> at 125 °C <sup>(2)</sup> (mJ)	E <sub>OFF</sub> at 125 °C <sup>(2)</sup> (mJ)	Reference speed (kHz)	
					(A)	(°C)					
 <b>SOT-227 (isolated)</b>	<b>VS-GT80DA60U</b>	Single switch with AP diode	600	80	85	90	2.12	2.3	1.43	8 to 30	
	UL-approved; fully isolated package; industry-standard outline; high speed Trench gate field-stop IGBT; FRED Pt® anti-parallel diode with ultrasoft reverse recovery; very low internal inductance (≤ 5 nH typical)										
	<b>VS-GT90DA60U</b>	Single switch with AP diode	600	90	92	90	1.77	1.63	0.9	8 to 30	
	UL-approved; fully isolated package; industry-standard outline; high speed Trench gate field-stop IGBT; HEXFRED® anti-parallel diode with ultrasoft reverse recovery; very low internal inductance (≤ 5 nH typical)										
	<b>VS-GT250SA60S</b>	Single switch no diode	600	250	250	90	1.27	2.03 <sup>(3)</sup>	9.65 <sup>(3)</sup>	DC to 1	
	UL-approved; fully isolated package; industry-standard outline; high speed Trench gate field-stop IGBT; lowest conduction losses available; very low internal inductance (≤ 5 nH typical)										
	<b>VS-GT80DA120U</b>	Single switch with AP diode	1200	80	93	90	2.4	5.8	5.6	8 to 30	
	UL-approved; fully isolated package; industry-standard outline; high speed Trench gate field-stop IGBT; 10 μs short circuit capability; HEXFRED® anti-parallel diode with ultrasoft reverse recovery; very low internal inductance (≤ 5 nH typical)										
	<b>VS-GT90DA120U</b>	Single switch with AP diode	1200	90	106	90	2.62	2.23 <sup>(3)</sup>	3.87 <sup>(3)</sup>	8 to 30	
	UL-approved; fully isolated package; industry-standard outline; high speed Trench gate field-stop IGBT; HEXFRED® anti-parallel diode with ultrasoft reverse recovery; very low internal inductance (≤ 5 nH typical)										
	<b>VS-GT90SA120U</b>	Single switch no diode	1200	90	106	90	2.62	2.23 <sup>(3)</sup>	3.87 <sup>(3)</sup>	8 to 30	
	UL-approved; fully isolated package; industry-standard outline; high speed Trench gate field-stop IGBT; very low internal inductance (≤ 5 nH typical)										
<b>VS-GT100DA120UF</b>	Single switch with AP diode	1200	100	123	90	2.26	3.9	7.1	8 to 30		
UL-approved; fully isolated package; industry-standard outline; high speed Trench gate field-stop IGBT; HEXFRED® anti-parallel diode with ultrasoft reverse recovery; very low internal inductance (≤ 5 nH typical)											
<b>VS-GT180DA120U</b>	Single switch with AP diode	1200	180	185	90	2.39	5.7 <sup>(3)</sup>	11.6 <sup>(3)</sup>	8 to 30		
UL-approved; fully isolated package; industry-standard outline; high speed Trench gate field-stop IGBT; 10 μs short circuit capability; HEXFRED® anti-parallel diode with ultrasoft reverse recovery; very low internal inductance (≤ 5 nH typical)											


Low Side and High Side Chopper IGBT Modules											
Package	Device	Type	V <sub>CES</sub> (V)	I <sub>C, nom</sub> (A)	I <sub>C</sub> at T <sub>C</sub>		V <sub>CE(ON)</sub> at 125 °C <sup>(1)</sup> (V)	E <sub>ON</sub> at 125 °C <sup>(2)</sup> (mJ)	E <sub>OFF</sub> at 125 °C <sup>(2)</sup> (mJ)	Reference speed (kHz)	
					(A)	(°C)					
 <b>SOT-227 (isolated)</b>	<b>VS-GT75LA60UF</b>	Low side chopper	600	75	61	80	2.09	0.95 <sup>(3)</sup>	0.53 <sup>(3)</sup>	Up to 150	
	UL-approved; fully isolated package; industry-standard outline; very low internal inductance (≤ 5 nH typical); Trench IGBT technology; low V <sub>CE(ON)</sub> ; FRED Pt® hyperfast rectifier										
	<b>VS-GT75NA60UF</b>	High side chopper	600	75	61	80	2.09	0.95 <sup>(3)</sup>	0.53 <sup>(3)</sup>	Up to 150	
	UL-approved; fully isolated package; industry-standard outline; very low internal inductance (≤ 5 nH typical); Trench IGBT technology; low V <sub>CE(ON)</sub> ; FRED Pt® hyperfast rectifier										
	<b>VS-GT50LA65UF</b>	Low side chopper	650	50	44	80	2.01	0.68	0.27	Up to 150	
	UL-approved; fully isolated package; industry-standard outline; very low internal inductance (≤ 5 nH typical); Trench IGBT technology; low V <sub>CE(ON)</sub> ; FRED Pt® Gen 4 clamping diode										
	<b>VS-GT100LA65UF</b>	Low side chopper	650	100	70	80	2.01	3.16	0.72	Up to 150	
	UL-approved; fully isolated package; industry-standard outline; very low internal inductance (≤ 5 nH typical); Trench IGBT technology; low V <sub>CE(ON)</sub> ; FRED Pt® Gen 4 clamping diode										
	<b>VS-GT55LA120UX</b>	Low side chopper	1200	55	47	80	2.87	4.6	2.5	8 to 60	
	UL-approved; fully isolated package; industry-standard outline; very low internal inductance (≤ 5 nH typical); Trench IGBT technology; low V <sub>CE(ON)</sub> ; HEXFRED® clamping diode										
<b>VS-GT55NA120UX</b>	High side chopper	1200	55	47	80	2.87	4.6	2.5	8 to 60		
UL-approved; fully isolated package; industry-standard outline; very low internal inductance (≤ 5 nH typical); Trench IGBT technology; low V <sub>CE(ON)</sub> ; HEXFRED® clamping diode											










# IGBT POWER MODULES

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Low Side and High Side Chopper IGBT Modules (contd)										
Package	Device	Type	V <sub>CES</sub> (V)	I <sub>C, nom</sub> (A)	I <sub>C</sub> at T <sub>C</sub>		V <sub>CE(ON)</sub> at 125 °C <sup>(1)</sup> (V)	E <sub>ON</sub> at 125 °C <sup>(2)</sup> (mJ)	E <sub>OFF</sub> at 125 °C <sup>(2)</sup> (mJ)	Reference speed (kHz)
					(A)	(°C)				
 Dual INT-A-PAK (isolated)	<b>VS-GT400LH060N</b>	Low side chopper	600	400	375	80	1.93	17.2 (R <sub>g,on</sub> = 6.8 Ω)	21.2 (R <sub>g,off</sub> = 1 Ω)	Up to 10
	Industry-standard package; Trench IGBT technology; 6 μs short circuit capability; low V <sub>CE(ON)</sub> ; FRED Pt® antiparallel diode with ultrasoft reverse recovery characteristics									

Half-Bridge IGBT Modules										
Package	Device	Type	V <sub>CES</sub> (V)	I <sub>C, nom</sub> (A)	I <sub>C</sub> at T <sub>C</sub>		V <sub>CE(ON)</sub> at 125 °C <sup>(1)</sup> (V)	E <sub>ON</sub> at 125 °C <sup>(2)</sup> (mJ)	E <sub>OFF</sub> at 125 °C <sup>(2)</sup> (mJ)	Reference speed (kHz)
					(A)	(°C)				
 Dual INT-A-PAK Low Profile (isolated)	<b>VS-GT300TD60S</b>	Half bridge	600	300	349	80	1.16	2	20	DC to 1
	UL-approved; industry-standard package; Trench IGBT technology; low V <sub>CE(ON)</sub> ; Gen 4 FRED Pt® antiparallel diodes									
 Dual INT-A-PAK Low Profile (isolated)	<b>VS-GT400TD60S</b>	Half bridge	600	400	532	80	1.13	2.2	27.6	DC to 1
	UL-approved; industry-standard package; Trench IGBT technology; low V <sub>CE(ON)</sub> ; Gen 4 FRED Pt® antiparallel diodes									
 Dual INT-A-PAK (isolated)	<b>VS-GT600TH60S</b>	Half bridge	600	600	565	80	1.36	39	53	DC to 1
	Designed for industrial level; Trench IGBT technology; low V <sub>CE(ON)</sub> ; Gen 4 FRED Pt® antiparallel diodes; optimized for hard switching speed									
 INT-A-PAK (isolated)	<b>VS-GT100TS065N</b>	Half bridge	650	100	72	80	2.12	3.2	1	8 to 30
	UL-approved; designed for industrial level; Trench IGBT technology; very low switching losses; Gen 4 FRED Pt® antiparallel diodes with ultra soft reverse recovery characteristics									
	<b>VS-GT200TS065N</b>	Half bridge	650	200	144	80	2.13	2.82	3.86	8 to 30
	UL-approved; designed for industrial level; Trench IGBT technology; very low switching losses; Gen 4 FRED Pt® antiparallel diodes with ultra soft reverse recovery characteristics									
	<b>VS-GT100TS065S</b>	Half bridge	650	100	185	80	1.02	0.5	6.5	DC to 1
	UL-approved; designed for industrial level; Trench IGBT technology; very low conduction losses; Gen 4 FRED Pt® antiparallel diodes with ultra soft reverse recovery characteristics									
	<b>VS-GT150TS065S</b>	Half bridge	650	150	280	80	1.05	0.7	10.3	DC to 1
UL-approved; designed for industrial level; Trench IGBT technology; very low conduction losses; Gen 4 FRED Pt® antiparallel diodes with ultra soft reverse recovery characteristics										
 MTP Solderable (isolated)	<b>VS-50MT060PHTAPbF</b>	Half bridge	600	50	50	117	1.45	1.46 <sup>(3)</sup>	0.62 <sup>(3)</sup>	30 to 100
	UL-approved; designed and qualified for industrial level; Trench IGBT technology; very low conduction and switching losses; HEXFRED® antiparallel diodes with ultrasoft reverse recovery; optional SMD thermistor (NTC); very low junction to case thermal resistance									
	<b>VS-40MT120PHAPbF</b>	Half bridge	1200	40	40	102	2.7	1.02	1.83	8 to 30
UL-approved; designed and qualified for industrial level; Trench IGBT; 5 μs short circuit capability; HEXFRED® antiparallel diodes with ultrasoft reverse recovery and low V <sub>F</sub>										

Full-Bridge IGBT Modules										
Package	Device	Type	V <sub>CES</sub> (V)	I <sub>C, nom</sub> (A)	I <sub>C</sub> at T <sub>C</sub>		V <sub>CE(ON)</sub> at 125 °C <sup>(1)</sup> (V)	E <sub>ON</sub> at 125 °C <sup>(2)</sup> (mJ)	E <sub>OFF</sub> at 125 °C <sup>(2)</sup> (mJ)	Reference speed (kHz)
					(A)	(°C)				
 MTP Solderable (isolated)	<b>VS-50MT060TFT</b>	Full bridge	600	50	41	80	2.1	0.53	0.31	30 to 100
	UL-approved; designed and qualified for industrial level; Trench IGBT technology; FRED Pt® Gen5 antiparallel diodes with ultrasoft reverse recovery; low V <sub>F</sub> diode									
 MTP Solderable (isolated)	<b>VS-20MT120PPF</b>	Full bridge	1200	20	42	80	2.06	1.08	1.18	8 to 30
	UL-approved; 10 μs short circuit capability; Trench IGBT technology; HEXFRED® antiparallel diodes with ultrasoft reverse recovery; low V <sub>F</sub> diode									



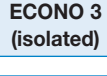


# IGBT POWER MODULES


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### 4-Pack IGBT Modules

Package	Device	Type	V <sub>CES</sub> (V)	I <sub>C, nom</sub> (A)	I <sub>C</sub> at T <sub>C</sub>		V <sub>CE(ON)</sub> at 125 °C <sup>(1)</sup> (V)	E <sub>ON</sub> at 125 °C <sup>(2)</sup> (mJ)	E <sub>OFF</sub> at 125 °C <sup>(2)</sup> (mJ)	Reference speed (kHz)	
					(A)	(°C)					
 <b>ECONO 2 (isolated)</b>	<b>VS-GT50YF120NT</b>	4 pack	1200	50	44	80	2.66	1.58	2.52	8 to 30	
	Designed and qualified for industrial market; Trench IGBT; HEXFRED® low Q <sub>rr</sub> , low switching energy; PCB solderable terminals										
	<b>VS-GT75YF120NT</b>	4 pack	1200	75	81	80	2.44	3.35	4.28	8 to 30	
	Designed and qualified for industrial market; Trench IGBT; HEXFRED® low Q <sub>rr</sub> , low switching energy; PCB solderable terminals										
 <b>ECONO 3 (isolated)</b>	<b>VS-GT75YF120UT</b>	4 pack	1200	75	81	80	2.44	3.17	4.23	8 to 30	
	Designed and qualified for industrial market; Trench IGBT; HEXFRED® low Q <sub>rr</sub> , low switching energy; PCB solderable terminals										
	<b>VS-GT100YG120UT</b>	4 pack	1200	100	115	80	2.35	4.09	5.67	8 to 30	
	UL-approved; Trench IGBT; 5 μs short circuit capability; HEXFRED® low Q <sub>rr</sub> , low switching energy; PCB solderable terminals										
 <b>ECONO 3 (isolated)</b>	<b>VS-GT150YG120NT</b>	4 pack	1200	150	166	80	2.47	5.26	8.6	8 to 30	
	UL-approved; Trench IGBT; 5 μs short circuit capability; HEXFRED® low Q <sub>rr</sub> , low switching energy; PCB solderable terminals										
	UL-approved; Trench IGBT; 5 μs short circuit capability; HEXFRED® low Q <sub>rr</sub> , low switching energy; PCB solderable terminals										

### Inverter IGBT Modules

Package	Device	Type	V <sub>CES</sub> (V)	I <sub>C, nom</sub> (A)	I <sub>C</sub> at T <sub>C</sub>		V <sub>CE(ON)</sub> at 125 °C <sup>(1)</sup> (V)	E <sub>ON</sub> at 125 °C <sup>(2)</sup> (mJ)	E <sub>OFF</sub> at 125 °C <sup>(2)</sup> (mJ)	Reference speed (kHz)
					(A)	(°C)				
 <b>Dual INT-A-PAK (isolated)</b>	<b>VS-GT300YH120N</b>	Current fed inverter topology	1200	300	300	80	2.24	33.2	37.4	4 to 30
Industry-standard outline; 1200 V Trench IGBT; low switching losses; 10 μs short circuit capability; HEXFRED® antiparallel and series diodes with soft reverse recovery										

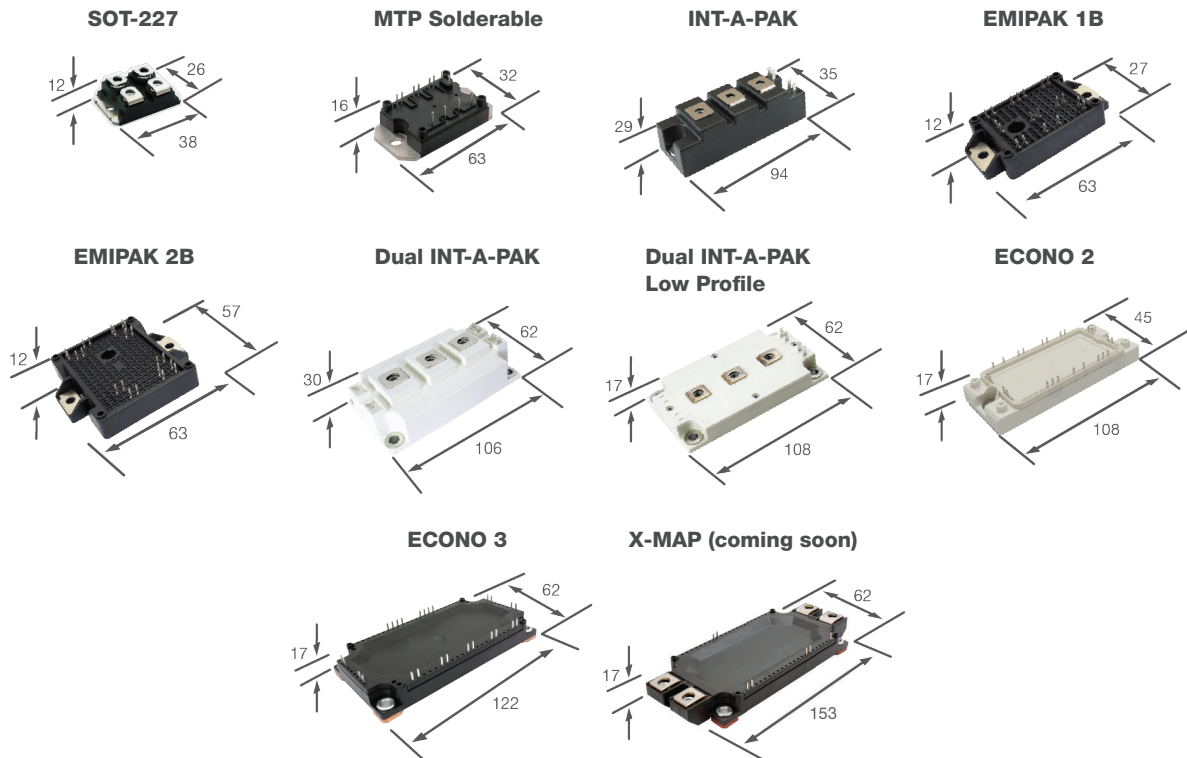
#### Notes

<sup>(1)</sup> Measured at I<sub>C</sub> = I<sub>C, nom</sub>

<sup>(2)</sup> Measured at I<sub>C</sub> = I<sub>C, nom</sub>, V<sub>CC</sub> = 0.5 V<sub>CES</sub>

<sup>(3)</sup> Different test condition, see datasheet

## Package Dimensions (in millimeters)





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# Standard Package IGBT Power Modules – Tailored for Industrial and Renewable Segments

## Advantages of Vishay IGBT Power Modules

- Industrial standard packages in isolated (3500 V at  $t = 1$  s) versions
- Mains electric topology available to address industrial inverter requirements
- 600 V, 650 V, 1200 V Trench IGBTs achieve the best efficiency in different applications
- Module connection available in solderable pin, PressFit, and screwable forms according to power level requested

## For the Following Applications

- Welding
- Uninterruptible power supplies (UPS)
- Solar inverters



Extensive product portfolio for input rectification, primary inverter, secondary AC/DC inverter, and output rectification for high frequency welding and plasma cutting



Integrated solution for solar inverters and UPS

## Useful Links

- IGBT Power Modules  
[www.vishay.com/modules/igbt-modules/](http://www.vishay.com/modules/igbt-modules/)
- Power Modules Selector Guide  
[www.vishay.com/doc?49382](http://www.vishay.com/doc?49382)



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