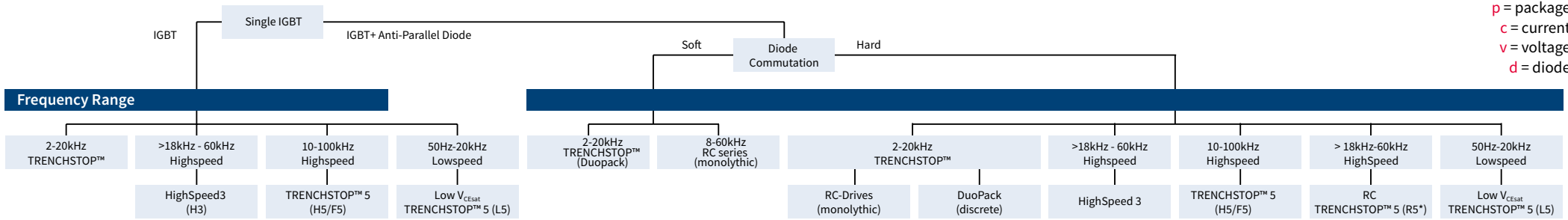


IGBT Selection Guide

Common IGBT Applications and Topologies

IGBT Selection Tree

Nomenclature: IGBT
 IKpccNvvvdH3
 p = package
 c = current
 v = voltage
 d = diode



Voltage Range										
600V	600V, 650V, 1200V	650V	600V, 1200V	600V, 1100V, 1200V, 1350V, 1600V	600V	600V, 1200V	600V, 1200V	650V	650V	650V

Part Number										
IGpccN60T... IGpccT120... IGpccN120T2	IGpccN60H3 IGpccN120H3 IGpccN65H5 IGpccN65F5	IGpccN65L5	IHpccN60T IHpccT60... IHpccT120..	IHpccNvvvR2 IHpccNvvvR3 IHpccN60R/RF IHpccNvvvR5	IKpccN60R IKpccN60RF	IKpccN60dT IKpccT120... IKpccN120dT2	IKpccN60dH3 IKpccN120dH3	IKpccN65dH5 IKpccN65dF5	IKpccN65dR5	IKpccN65dL5

Application										
Conduction Loss Optimized Hard switching topologies without anti-parallel diode	<p>DC/DC: Welding Inverter Full Bridge Two Transistor Forward Solar Inverter</p> <p>AC/DC: PFC Welding UPS Solar boost stage AirCon</p>	<p>UPS 3 level NPC topology, inner switches</p> <p>Solar 3 level NPC topology, inner switches</p> <p>Welding AC Output (Al/Mag welding)</p>	<p>Induction Heating Microwave Multifunction Printers Half Bridge Resonant (Current resonance - 600V parts)</p> <p>Single Switch (Voltage resonance >600V parts)</p>	<p>Conduction Loss Optimized Solar Inverter Asymmetrical Bridge Symmetrical full bridge Three level type I or Three level type II converter Motor Control Three phase inverter Full bridge inverter Uninterruptable Power Supply UPS Bridge Three level type II converter Major Home Appliances Symmetrical full bridge</p>	<p>Switching Loss Optimized Solar Inverter Asymmetrical Bridge Symmetrical full bridge Three level type I or Three level type II converter Motor Control Three phase inverter Full bridge inverter Uninterruptable Power Supply Three level type II converter Major Home Appliances Symmetrical full bridge Welding Inverter Full Bridge Half Bridge Two Transistor Forward</p> <p>AC/DC: PFC Welding UPS Solar boost stage Battery Charger SMPS HVDC (Telecom/Data Centers)</p>	<p>AC/DC: PFC Welding UPS Solar boost stage Battery Charger SMPS HVDC (Telecom/Data Centers)</p> <p>DC/DC: Welding Inverter Full Bridge Half Bridge Two Transistor Forward</p>	<p>UPS 3 level NPC topology, inner switches</p> <p>Solar 3 level NPC topology, inner switches</p> <p>Welding AC Output (Al/Mag welding)</p>			

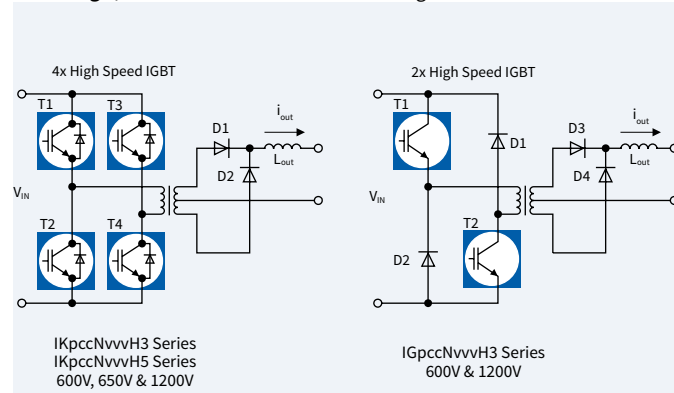
Automotive IGBT (AECQ101)

<p>Frequency range 2-20kHz RC-Drives TRENCHSTOP™</p>	<p>Voltage range 600V</p>	<p>Part Number IKpccN60RA IKpccN60RFA IHpccN60RA IKpccN60TA</p>	<p>Application Power Train HID Piezo injection AirCon Compressor Pumps Small Drives</p>
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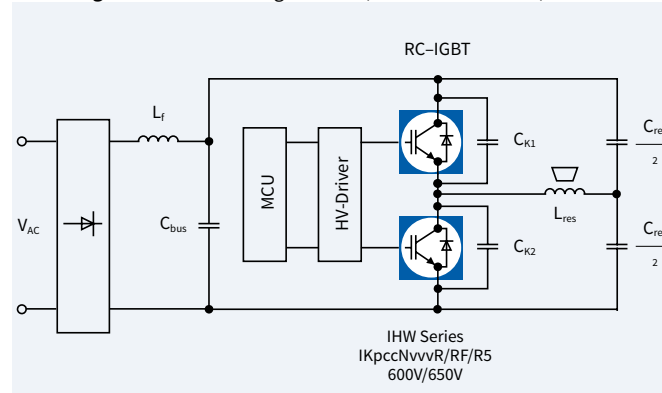
*Optimized for zero current switching (ZCS) applications

Common IGBT Applications and Topologies

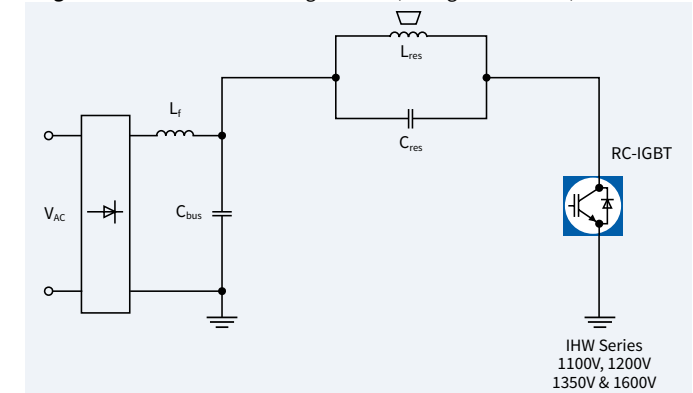
Full Bridge / Two Transistor Forward: Welding Inverter



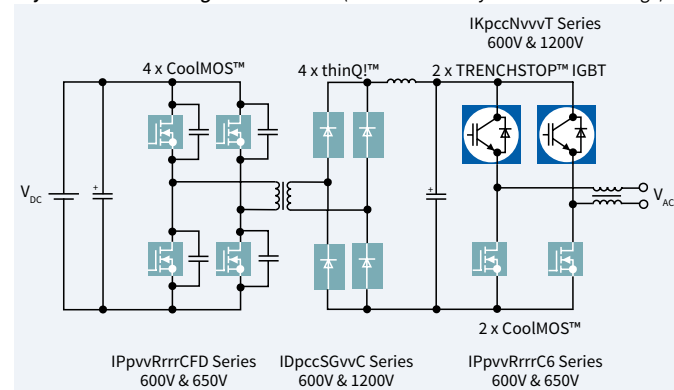
Half Bridge: Induction Heating Inverter (Current Resonance)



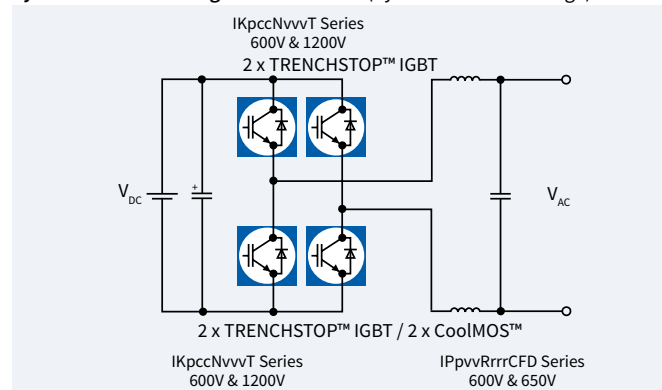
Single switch: Induction Heating Inverter (Voltage Resonance)



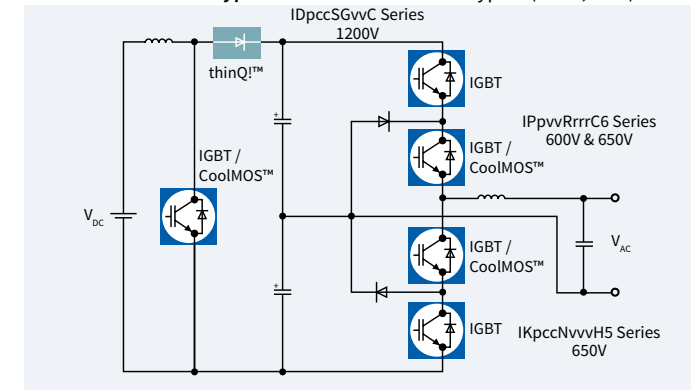
Asymmetrical Full Bridge: Solar Inverter (Phase-Shift & Asymmetrical Full Bridge)



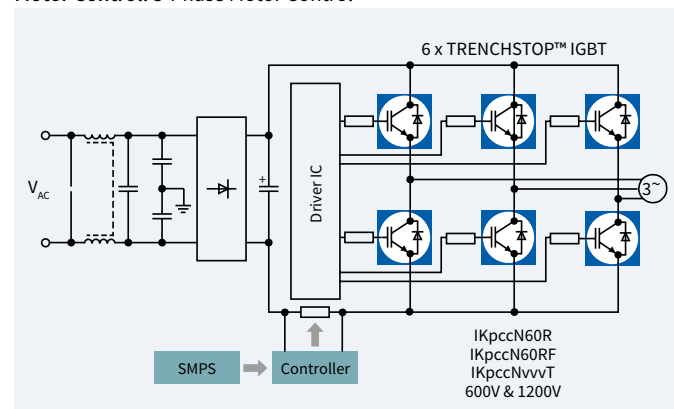
Symmetrical Full Bridge: Solar Inverter (Symmetrical Full Bridge)



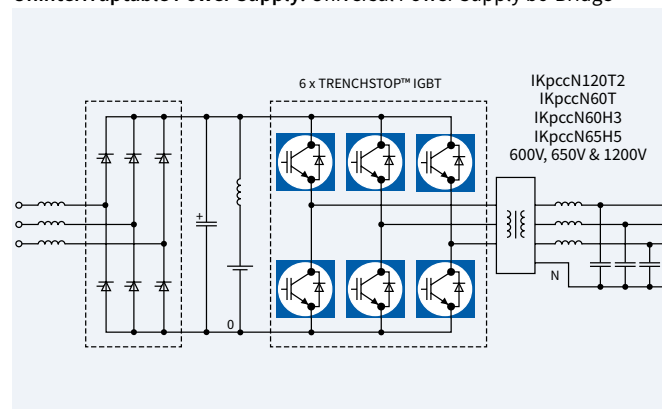
Three Level Inverter Type II: Three-Level Inverter Type II (Solar, UPS)



Motor Control: 3-Phase Motor Control



Uninterruptable Power Supply: Universal Power Supply b6-Bridge



Nomenclature: IGBT

IKpccNvvvdH3

p = package

c = current

v = voltage

d = diode

Nomenclature: MOSFET

IPpvvRrrrCFD

p = package

c = current

r = resistance

■ IGBT parts

■ other Infineon parts

www.infineon.com/igbt

www.infineon.com/coolmos

www.infineon.com/sic

IGBT with Anti-Parallel Diode

Product Type	$V_{CE(max)}$ [V]	Diode	Switching Frequency [F]	Package	Switching Hard/Soft	Series	$I_{C(max)}$ @ 100° [A]	$V_{CE(sat)}$ (typ) [V]	E_{off} (typ) [mJ]	E_{on} (typ) [mJ]	Q_r (typ) [mC]
IKW20N60H3	600	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	20	1.95	0.24	0.56	390
IKB20N60H3	600	Y	18-60kHz	TO-263-3	Hard	HighSpeed 3	20	1.95	0.24	0.45	390
IKP20N60H3	600	Y	18-60kHz	TO-220-3	Hard	HighSpeed 3	20	1.95	0.24	0.45	390
IKW30N60H3	600	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	30	1.95	0.44	0.94	320
IKW40N60H3	600	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	40	1.95	0.58	1.1	810
IKW50N60H3	600	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	50	1.85	0.91	1.45	880
IKW60N60H3	600	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	60	1.85	1.13	2.1	1200
IKW75N60H3	600	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	75	1.85	1.7	3	1800
IKW15N120H3	1200	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	15	2.05	0.45	1.1	800
IKW25N120H3	1200	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	25	2.05	0.85	1.8	1200
IKW40N120H3	1200	Y	18-60kHz	TO-247-3	Hard	HighSpeed 3	40	2.05	1.2	3.2	1900
IKD04N60R/A	600	Y	2Hz-4kHz	TO-252-3	Hard	RC-Drives	4	1.65	0.15	0.09	220
IKD06N60R/A	600	Y	2Hz-4kHz	TO-252-3	Hard	RC-Drives	6	1.65	0.22	0.11	370
IKD10N60R/A	600	Y	2Hz-4kHz	TO-252-3	Hard	RC-Drives	10	1.65	0.38	0.21	560
IKD15N60R/A	600	Y	2Hz-4kHz	TO-252-3	Hard	RC-Drives	15	1.65	0.53	0.37	760
IKU15N60R	600	Y	2Hz-4 kHz	TO-251-3	Hard	RC Drives	15	1.65	0.53	0.37	760
IKW40N65WR5	650	Y	>18-60kHz	TO-247-3	Hard	RC TRENCHSTOP™ 5	40	1.35	0.14	0.63	1950
IKW50N65WR5	650	Y	>18-60kHz	TO-247-3	Hard	RC TRENCHSTOP™ 5	50	1.35	0.18	0.74	2250
IKD03N60RF/A	600	Y	4-30kHz	TO-252-3	Hard	RC Drives Fast	2.5	2.2	0.04	0.05	60
IKD04N60RF/A	600	Y	4-30kHz	TO-252-3	Hard	RC Drives Fast	4	2.2	0.05	0.06	90
IKD06N60RF/A	600	Y	4-30kHz	TO-252-3	Hard	RC Drives Fast	6	2.2	0.09	0.09	160
IKD10N60RF/A	600	Y	4-30kHz	TO-252-3	Hard	RC Drives Fast	10	2.2	0.16	0.19	270
IKD15N60RF/A	600	Y	4-30kHz	TO-252-3	Hard	RC Drives Fast	15	2.2	0.25	0.27	420
IHW40N60R	600	Y	8-40kHz	TO-247-3	Soft	RC Soft Switching	40	1.65	0.75	-	-
IHW40N60RF	600	Y	20-60kHz	TO-247-3	Soft	RC Fast Soft Switching	40	1.85	0.56	-	-
IHW20N65R5	650	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	20	1.35	0.07	0.30	1000
IHW40N65R5	650	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	40	1.35	0.14	0.63	1950
IHW50N65R5	650	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	50	1.35	0.18	0.74	2200
IHW30N110R3	1100	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	30	1.55	1.15	-	-
IHW15N120R3	1200	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	15	1.48	0.7	-	-
IHW20N120R3	1200	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	20	1.48	0.95	-	-
IHW20N120R5	1200	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	20	1.55	0.75	-	-
IHW25N120R2	1200	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	25	1.6	1.59	-	-
IHW30N120R3	1200	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	30	1.55	1.47	d.o.r.	d.o.r.
IHW40T120	1200	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	40	1.8	3.2	3.3	1880
IHW40N120R3	1200	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	40	1.55	2.02	d.o.r.	d.o.r.
IHW20N135R3	1350	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	20	1.6	1.3	-	-

Product Type	$V_{CE(max)}$ [V]	Diode	Switching Frequency [F]	Package	Switching Hard/Soft	Series	$I_{C(max)}$ @ 100° [A]	$V_{CE(sat)}$ (typ) [V]	E_{off} (typ) [mJ]	E_{on} (typ) [mJ]	Q_{rr} (typ) [mC]
IHW20N135R5	1350	Y	8-60kHz	TO247-3	Soft	RC Soft Switching	20	1.65	0.95	-	-
IHW30N135R3	1350	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	30	1.65	1.93	d.o.r.	d.o.r.
IHW40N135R3	1350	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	40	1.65	2.5	d.o.r.	d.o.r.
IHW30N160R2	1600	Y	8-60kHz	TO-247-3	Soft	RC Soft Switching	30	1.8	2.53	-	-
IKP04N60T	600	Y	2-20kHz	TO-220-3	Hard	TRENCHSTOP™	4	1.5	84	61	79
IKB06N60T	600	Y	2-20kHz	TO-263-3	Hard	TRENCHSTOP™	6	1.5	0.11	0.09	190
IKP06N60T	600	Y	2-20kHz	TO-220-3	Hard	TRENCHSTOP™	6	1.5	0.11	0.09	190
IKA06N60T	600	Y	2-20kHz	TO-220 FP-3	Hard	TRENCHSTOP™	6.2	1.5	0.11	0.09	190
IKA10N60T	600	Y	2-20kHz	TO-220 FP-3	Hard	TRENCHSTOP™	7.2	1.5	0.27	0.16	380
IKA15N60T	600	Y	2-20kHz	TO-220 FP-3	Hard	TRENCHSTOP™	8.9	1.5	0.35	0.22	240
IKP10N60T	600	Y	2-20kHz	TO-220-3	Hard	TRENCHSTOP™	10	1.5	0.27	0.16	380
IKB10N60T	600	Y	2-20kHz	TO-263-3	Hard	TRENCHSTOP™	10	1.5	0.27	0.16	380
IKB15N60T	600	Y	2-20kHz	TO-263-3	Hard	TRENCHSTOP™	15	1.5	0.35	0.22	240
IKP15N60T	600	Y	2-20kHz	TO-220-3	Hard	TRENCHSTOP™	15	1.5	0.35	0.22	240
IKW20N60T/A	600	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	20	1.5	0.46	0.31	310
IKB20N60T/A	600	Y	2-20kHz	TO-263-3	Hard	TRENCHSTOP™	20	1.5	0.46	0.31	310
IKP20N60T/A	600	Y	2-20kHz	TO-220-3	Hard	TRENCHSTOP™	20	1.5	0.46	0.31	310
IHW30N60T	600	Y	2-20kHz	TO-247-3	Soft	TRENCHSTOP™	30	1.5	0.77	-	-
IKW30N60T/A	600	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	30	1.5	0.77	0.69	920
IHW40T60	600	Y	2-20kHz	TO-247-3	Soft	TRENCHSTOP™	40	1.55	0.92	-	-
IKW50N60T/A	600	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	50	1.5	1.4	1.2	1800
IKW75N60T/A	600	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	75	1.5	2.5	2	2400
IKQ100N60T/A	600	Y	2-20kHz	TO-247PLUS-3	Hard	TRENCHSTOP™	100	1.5	3.9	4.5	2800
IKQ120N60T/A	600	Y	2-20kHz	TO-247PLUS-3	Hard	TRENCHSTOP™	120	1.5	5.9	6.2	3400
IKW08T120	1200	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	8	1.7	0.7	0.67	1000
IKW15T120	1200	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	15	1.7	1.4	1.3	1900
IKW25T120	1200	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	25	1.7	2.2	2	2300
IKW40T120	1200	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	40	1.8	3.2	3.3	3800
IKW15N120T2	1200	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™ 2	15	1.7	0.8	1.25	1300
IKW25N120T2	1200	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™ 2	25	1.7	1.35	1.55	2050
IKW40N120T2	1200	Y	2-20kHz	TO-247-3	Hard	TRENCHSTOP™ 2	40	1.75	2.05	3.2	3300
IKA08N65F5/H5	650	Y	10-100kHz	TO-220 FP	Hard	TRENCHSTOP™ 5	6.8	1.6 / 1.65	0.02	0.07	140 / 130
IKA15N65F5/H5	650	Y	10-100kHz	TO-220 FP	Hard	TRENCHSTOP™ 5	8.5	1.6 / 1.65	0.04 / 0.05	0.13 / 0.12	100 / 200
IKP08N65F5/H5	650	Y	10-100kHz	TO-220-3	Hard	TRENCHSTOP™ 5	11	1.6 / 1.65	0.02	0.07	140 / 130
IKP15N65F5/H5	650	Y	10-100kHz	TO-220-3	Hard	TRENCHSTOP™ 5	18	1.6 / 1.65	0.04 / 0.05	0.13 / 0.12	100 / 200
IKP20N65F5/H5	650	Y	10-100kHz	TO-220-3	Hard	TRENCHSTOP™ 5	21	1.6/1.65	0.06	0.16/0.17	280/270
IKP30N65F5/H5	650	Y	10-100kHz	TO-220-3	Hard	TRENCHSTOP™ 5	35	1.6/1.65	0.07/0.1	0.28	410
IKP40N65F5/H5	650	Y	10-100kHz	TO-220-3	Hard	TRENCHSTOP™ 5	46	1.6 / 1.65	0.10 / 0.12	0.36 / 0.39	450
IKW30N65NL5	650	Y	50Hz-20kHz	TO-247-3	Soft	Low $V_{CE(sat)}$ TRENCHSTOP™ 5	30	1.05	1.28	0.32	480
IKW75N65EL5	650	Y	50Hz-20kHz	TO-247-3	Soft	Low $V_{CE(sat)}$ TRENCHSTOP™ 5	75	1.05	3.2	0.8	1240
IKZ75N65EL5	650	Y	50Hz-20kHz	TO-247-4	Soft	Low $V_{CE(sat)}$ TRENCHSTOP™ 5	75	1.05	3.2	0.8	1370
IKW40N65F5/H5	650	Y	10-100kHz	TO-247-3	Hard	TRENCHSTOP™ 5	46	1.6 / 1.65	0.14 / 0.16	0.36 / 0.35	420 / 410
IKW50N65F5/H5	650	Y	10-100kHz	TO-247-3	Hard	TRENCHSTOP™ 5	56	1.6 / 1.65	0.16 / 0.18	0.49 / 0.52	550 / 570
IKZ50N65NH5	650	Y	10-100kHz	TO-247-4	Hard	TRENCHSTOP™ 5	50	1.65	0.12	0.33	510
IKZ50N65EH5	650	Y	10-100kHz	TO-247-4	Hard	TRENCHSTOP™ 5	50	1.65	0.12	0.42	840
IKZ75N65NH5	650	Y	10-100kHz	TO-247-4	Hard	TRENCHSTOP™ 5	75	1.76	0.2	0.44	650
IKZ75N65EH5	650	Y	10-100kHz	TO-247-4	Hard	TRENCHSTOP™ 5	75	1.76	0.2	0.63	1150

IGBT without Anti-Parallel Diode

Product Type	$V_{CE(max)}$ [V]	Diode	Switching Frequency [F]	Package	Switching Hard/Soft	Series	$I_{C(max)}$ @ 100° [A]	$V_{CE(sat)}$ (typ) [V]	E_{off} (typ) [mJ]	E_{on} (typ) [mJ]	Q_{tr} (typ) [mC]
IGA30N60H3	600	N	18-60kHz	TO-220 FP-3	Hard	HighSpeed 3	11	1.95	0.44	0.73	n/a
IGB20N60H3	600	N	18-60kHz	TO-263-3	Hard	HighSpeed 3	20	1.95	0.24	0.45	n/a
IGP20N60H3	600	N	18-60kHz	TO-220-3	Hard	HighSpeed 3	20	1.95	0.24	0.45	n/a
IGW20N60H3	600	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	20	1.95	0.24	0.56	n/a
IGP30N60H3	600	N	18-60kHz	TO-220-3	Hard	HighSpeed 3	30	1.95	0.44	0.73	n/a
IGB30N60H3	600	N	18-60kHz	TO-263-3	Hard	HighSpeed 3	30	1.95	0.44	0.73	n/a
IGW30N60H3	600	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	30	1.95	0.44	0.94	n/a
IGW40N60H3	600	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	40	1.95	0.58	1.1	n/a
IGW50N60H3	600	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	50	1.85	0.91	1.45	n/a
IGW60N60H3	600	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	60	1.85	1.13	2.1	n/a
IGW75N60H3	600	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	75	1.85	1.7	3	n/a
IGW100N60H3	600	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	100	1.85	1.9	3.7	n/a
IGW15N120H3	1200	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	15	2.05	0.45	1.1	n/a
IGW25N120H3	1200	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	25	2.05	0.85	1.8	n/a
IGW40N120H3	1200	N	18-60kHz	TO-247-3	Hard	HighSpeed 3	40	2.05	1.2	3.2	n/a
IGD06N60T	600	N	2-20kHz	TO-252-3	Hard	TRENCHSTOP™	6	1.5	0.11	0.09	n/a
IGP06N60T	600	N	2-20kHz	TO-220-3	Hard	TRENCHSTOP™	6	1.5	0.11	0.09	n/a
IGB10N60T	600	N	2-20kHz	TO-263-3	Hard	TRENCHSTOP™	10	1.5	0.27	0.16	n/a
IGP10N60T	600	N	2-20kHz	TO-220-3	Hard	TRENCHSTOP™	10	1.5	0.27	0.16	n/a
IGB15N60T	600	N	2-20kHz	TO-263-3	Hard	TRENCHSTOP™	15	1.5	0.35	0.22	n/a
IGP15N60T	600	N	2-20kHz	TO-220-3	Hard	TRENCHSTOP™	15	1.5	0.35	0.22	n/a
IGB30N60T	600	N	2-20kHz	TO-263-3	Hard	TRENCHSTOP™	30	1.5	0.77	0.69	n/a
IGW30N60T	600	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	30	1.5	0.77	0.69	n/a
IGB50N60T	600	N	2-20kHz	TO-263-3	Hard	TRENCHSTOP™	50	1.5	1.4	1.2	n/a
IGP50N60T	600	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	50	1.5	1.4	1.2	n/a
IGW50N60T	600	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	50	1.5	1.4	1.2	n/a
IGW75N60T	600	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	75	1.5	2.5	2	n/a
IGW15T120	1200	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	15	1.7	1.4	1.3	n/a
IGW25T120	1200	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	25	1.7	2.2	2	n/a
IGW40T120	1200	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	40	1.8	3.2	3.3	n/a
IGW60T120	1200	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	60	1.7	5.2	4.3	n/a
IGW08T120	1200	N	2-20kHz	TO-247-3	Hard	TRENCHSTOP™	8	1.7	0.7	0.67	n/a
IGP20N65F5/H5	650	Y	10-100kHz	TO-220-3	Hard	TRENCHSTOP™ 5	21	1.6/1.65	0.06	0.16/0.17	-
IGP40N65F5/H5	650	N	10-100kHz	TO-220-3	Hard	TRENCHSTOP™ 5	46	1.6 / 1.65	0.14 / 0.16	0.36 / 0.35	n/a
IGW30N65L5	650	N	50Hz-20kHz	TO-247-3	Soft	Low $V_{CE(sat)}$ TRENCHSTOP™ 5	30	1.05	1.28	0.32	n/a
IGW40N65F5/H5	650	N	10-100kHz	TO-247-3	Hard	TRENCHSTOP™ 5	46	1.6 / 1.65	0.14 / 0.16	0.36 / 0.35	n/a
IGW50N65F5/H5	650	N	10-100kHz	TO-247-3	Hard	TRENCHSTOP™ 5	56	1.6 / 1.65	0.16 / 0.18	0.49 / 0.52	n/a
IGZ50N65H5	650	N	10-100kHz	TO-247-4	Hard	TRENCHSTOP™5	50	1.65	0.12	0.42	n/a
IGZ75N65H5	650	N	10-100kHz	TO-247-4	Hard	TRENCHSTOP™5	75	1.7	0.2	0.63	n/a
IGZ100N65H5	650	N	10-100kHz	TO-247-4	Hard	TRENCHSTOP™5	100	1.76	0.26	0.84	n/a