

Insulated Gate Bipolar Transistors (IGBTs)

— continued

Ultra-Fast Switching IGBTs

60 – 300kHz



- Ultra-low switching losses
- Minimal dynamic losses
- NPT (Non-Punch Through) technology
- Extremely rugged
- Cost-effective alternative to power MOSFETs in switch mode and uninterruptible power supplies, up to 300kHz
- Ideal for Power Factor Correction (PFC)

V_{CE0} V	I_C cont. @ 25°C A	$V_{CE(sat)}$ max. V	I_{CM} Pulsed A	t_r typ. ns	t_f max. ns	P_D @ 25°C W	Pack- age	Mfrs. List No.
600	10.0	2.5	50	25	65	125	TO-220	SGP10N60
600	20.0	2.5	80	35	63	175	TO-220	SGP20N60
600	30.0	2.5	116	45	70	250	TO-220	SGP30N60

SD451

Mfrs. List No.	Order Code	1+	25+	100+	250+
SGP10N60	165-360				
SGP20N60	165-372 †				
SGP30N60	165-384				

† Available until stocks are exhausted

Fast Switching

V_{CE0} V	I_C cont. @ 25°C A	$V_{CE(sat)}$ max. V	I_{CM} Pulsed A	t_r typ. ns	t_f max. (typ*) ns	P_D @ 25°C W	Pack- age	Mfr.	Mfrs. List No.
600	29	2.7	56	60	500*	125	a	INF	BUP401
600	42	2.7	104	80	500*	200	a	INF	BUP403
600	50	4.0	100	300	350	200	e	TOSH	GT50J101
600	80	3.5	160	300	400	200	e	TOSH	GT80J101
1000	12	3.0	16	100	150*	100	a	INF	BUP202
1000	21	3.0	30	150	200*	165	a	INF	BUP203
1000	35	3.0	50	200	300*	310	c	INF	BUP304
1200	8	4.0	16	300	500	100	d	TOSH	GT80J101
1200	15	4.0	30	300	500	150	d	TOSH	GT15Q101
1200	25	4.0	50	300	500	200	e	TOSH	GT25Q101

SD136

Mfrs. List No.	Order Code	1+	25+	100+	250+
GT80J101	.737-859 †				
GT15Q101	.737-872				
GT25Q101	.737-896				
GT50J101	.737-914				
GT80J101	737-926				
BUP202	210-780				
BUP203	210-791				
BUP304	210-808				
BUP401	743-604				
BUP403	743-616				

† Available until stocks are exhausted

Internally Clamped IGBTs

ON Semiconductor



- Temperature compensated gate-collector clamped
- Overload protected
- Logic level gate drive
- High pulsed current capability
- ESD protected
- Low saturation voltage

Clamped V_{CE0} V	I_C cont 25°C A	$V_{ce(sat)}$ max. V	I_{cm} Pulsed A	P_D 25°C W	Pack- age	Mfrs. List No.
135	20.0	1.9	60	150	TO-220	MGP20N14CL
400	20.0	1.8	—	150	TO-220	MGP20N40CL

SD98

Mfrs. List No.	Order Code	1+	25+	100+	250+
MGP20N14CL	300-5720				
MGP20N40CL	300-5732				

UFS Series N-Channel

intersil

V_{CE0} V	I_C cont @ 25°C A	$V_{CE(sat)}$ max V	I_{CM} Pulsed A	t_r typ. ns	t_f max ns	P_D @ 25°C W	Pack- age	Mfrs. List No.
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Ultra-Fast Switching
600 63 1.8 252 45.0 275 208 b HGTG30N60C3

Rugged, Ultra-Fast Switching (10µs Short-Circuit Rated)
600 40 2.2 80 40.0 400 164 b HGTG20N60C3R

SD386

Mfrs. List No.	Order Code	1+	25+	100+	250+
HGTG30N60C3	.935-323				
HGTG20N60C3R	.935-335				

Ultra-High Speed Switching

- High frequency operation >10kHz
- N-Channel polarity
- Very low switching losses
- Low tail current
- Latch-up free
- Avalanche rated

V_{CE0} V	I_C cont. @ 25°C A	$V_{CE(sat)}$ max. V	I_{CM} Pulsed A	t_r typ. ns	t_f max. (typ.†) ns	P_D @ 25°C W	Pack- age	Mfr.	Mfrs. List No.
600	40	2.4	160	19	180	160	a	IR	IRG4BC40U
600	40	2.4	160	19	180	160	b	IR	IRG4PC40U
600	55	2.4	220	20	130	200	b	IR	IRG4PC50U
1200	32	3.2	64	45	95	200	a	INF	BUP213
1200	52	3.2	104	65	60	300	c	INF	BUP314

SD151

Mfrs. List No.	Order Code	1+	25+	100+	250+
BUP213	743-586				
BUP314	743-598				
IRG4BC40U	742-820				
IRG4PC40U	.742-831				
IRG4PC50U	.742-855				

Short Circuit Rated, N-Channel

ON Semiconductor

- 10µs min. short circuit withstand time
- Robust high voltage termination
- Options include in-built anti-parallel ultra-fast soft recovery diodes
- Robust RBSOA

V_{CE0} V	I_C @ 25°C A	$V_{CE(sat)}$ max V	I_{CM} Pulsed A	t_r typ. ns	t_f typ. ns	P_D @ 25°C W	Package	Mfrs. List No.
600	32	2.86	64	61	212	142	b	MGW20N60D*
600	50	2.9	100	80	188	202	b	MGW30N60
600	66	2.8	132	95	180	260	b	MGY40N60D*
1200	20	3.37	40	83	231	123	b	MGW12N120D*

* Incorporates a soft recovery, anti-parallel diode

SD369

Mfrs. List No.	Order Code	1+	25+	100+	250+
MGW12N120D	877-979				
MGW20N60D	877-980 †				
MGW30N60	877-992				
MGY40N60D	878-054 †				

† Available until stocks are exhausted

Fast IGBT

With Antiparallel Diode



- Low forward voltage drop
- Low tail current
- High speed switching
- Latch-up free

V_{CE0} V	25°C A	I_C Pulsed min	$V_{CE(sat)}$ max V	@ A	I_F diode A	t_r typ. ns	Package	Mfrs. List No.
600	22	44	2.7	10	11	60	(a)	BUP400D
600	36	72	2.7	20	31	70	(c)	BUP602D
600	42	104	2.7	30	31	80	(c)	BUP603D
1200	3.6	7.2	3.3	1.5	8	20	(a)	BUP200D
1200	23	46	2.8	10	18	30	(c)	BUP306D
1200	32	64	3.2	15	18	45	(c)	BUP313D
1200	42	84	3.2	25	28	65	(c)	BUP314D

SD113

Mfrs. List No.	Order Code	1+	25+	100+	250+
BUP200D	743-501				
BUP306D	743-525 †				
BUP313D	743-537				
BUP314D	743-549				
BUP400D	743-550 †				
BUP602D	743-562				
BUP603D	743-574				

† Available until stocks are exhausted

Ultra-Fast IGBT

With Anti-Parallel Hyperfast Diode

intersil



- >100kHz operation @ 390V, 12A
- 200kHz operation @ 390V, 9A
- 600V switching SOA capability
- Typical fall time 70ns @ $T_J = 125^\circ\text{C}$
- Low conduction losses
- High pulsed current capability

V_{CE0} V	I_C cont 25°C A	$V_{ce(sat)}$ max. V	I_{CM} Pulsed A	t_r typ. ns	t_f max. typ. ns	P_D 25°C W	Package	Mfrs. List No.
600	54	2.7	96	8	18	167	TO-220	HGTP12N60A4D

SD97

Mfrs. List No.	Order Code	1+	25+	100+	250+
HGTP12N60A4D	302-0666				