1200V XPT™ IGBTs

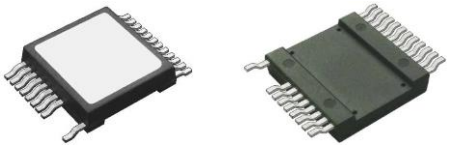
(for high-speed hard-switching applications)

IXYS Corporation

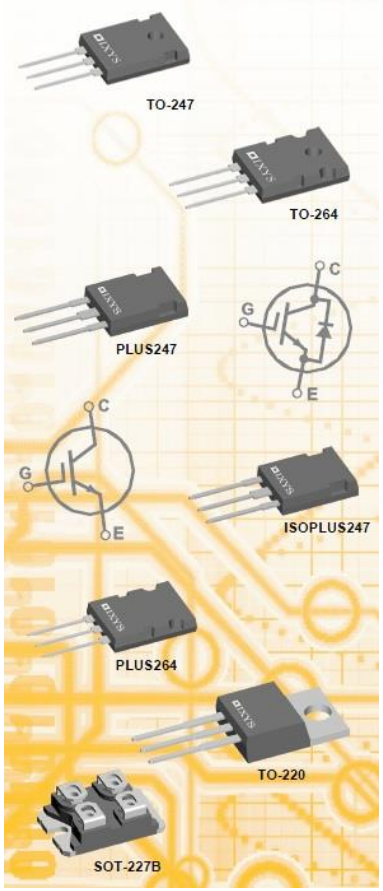
October 2012

Product Line Introduction (1200V XPT™ IGBTs)

- Broadest discrete IGBTs portfolio at 1200V (29 devices so far)
- From 7A to 120A current ratings at high temperature T_C = 110°C
- Manufactured through IXYS's state-of-the-art GenX3™ IGBT process and extreme-light Punch-Through (XPT™) design platform
- Designed for high-speed hard-switching power conversion applications
- Low turn-on and turn-off energy losses
- Low gate drive requirements
- Available in international standard packages
- Also available (upon request) in surface-mountable ultra-low profile SMPD and Mini-SMPD packages

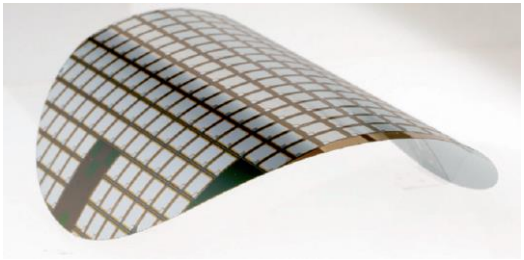


SMPD



Technology Advantages

Extreme-Light Punch-Through (XPT™) Design Platform



- Thin wafer technology
- Reduced thermal resistance (R_{thJC})
- Higher current densities
- Reduced chip sizes
- Positive temperature coefficient of $V_{CE(sat)}$

Ultra-Fast Anti-Parallel Recovery Diodes

- Available with co-packed Sonic-FRED™ or HiPerFRED™ diodes
- Reduced turn-off losses and smooth switching waveforms
- Low electromagnetic interference (EMI)
- Short reverse recovery times (t_{rr})

Square Reverse Bias Safe Operating Areas (RBSOA)

- Up to the breakdown voltage of 1200V
- Ruggedness in snubberless hard-switching applications

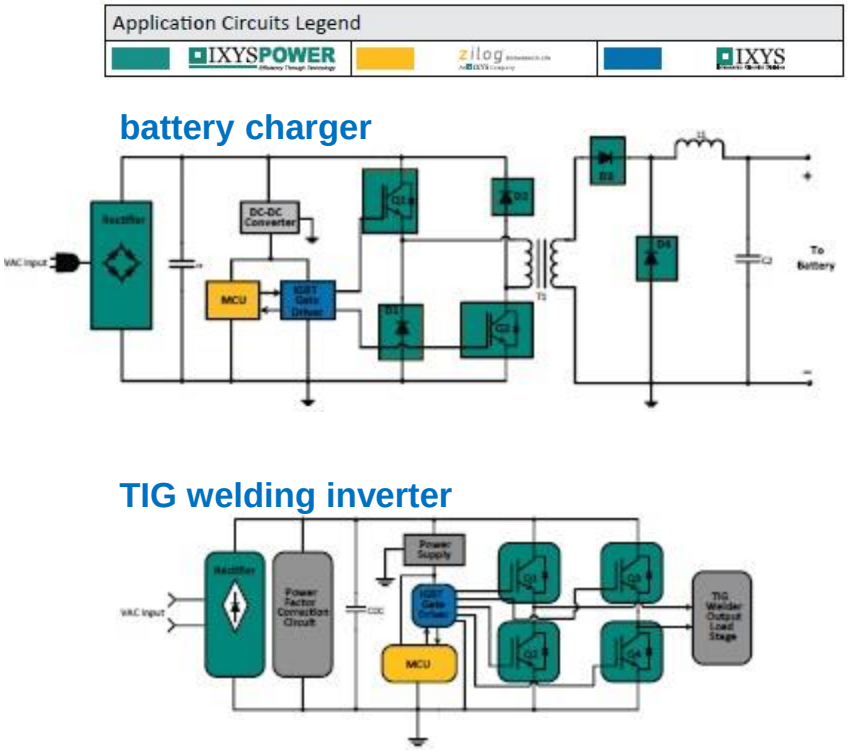
Summary Table (1200V XPT™ IGBTs)

Part Number	V_{CES} (V)	I_{C25} T_C=25°C (A)	I_{C110} T_C=110°C (A)	$V_{CE(sat)}$ max T_J=25°C (V)	t_{fi} typ T_J=125°C (ns)	E_{off} typ T_J=125°C (mJ)	R_{thJC} max IGBT (°C/W)	Configuration	Package Style
IXYJ20N120C3D1	1200	16	7	4	105(T_J=150 °C)	0.7(T_J=150 °C)	1.78	Copacked (FRED)	ISO TO-247
IXYH20N120C3D1	1200	36	17	4	105(T_J=150 °C)	0.7(T_J=150 °C)	0.54	Copacked (FRED)	TO-247
IXYH20N120C3	1200	40	20	4	105(T_J=150 °C)	0.7(T_J=150 °C)	0.54	Single	TO-247
IXYP20N120C3	1200	40	20	4	105(T_J=150 °C)	0.7(T_J=150 °C)	0.54	Single	TO-220
IXYH30N120C3	1200	66	30	4	88	0.9	0.3	Single	TO-247
IXYH30N120C3D1	1200	66	30	4	88	0.9	0.3	Copacked (FRED)	TO-247
IXYP30N120C3	1200	66	30	4	88	0.9	0.3	Single	TO-220
IXYR50N120C3D1	1200	56	32 (T_C=90°C)	4	60(T_J=150 °C)	1.4 (T_J=150 °C)	0.43	Copacked (FRED)	ISOPLUS247
IXYH40N120B3	1200	96	40	2.9	206	2.05	0.26	Single	TO-247
IXYH40N120B3D1	1200	86	40	2.9	206	2.05	0.26	Copacked (FRED)	TO-247
IXYH40N120C3	1200	70	40	4	38	0.7	0.26	Single	TO-247
IXYH40N120C3D1	1200	64	40	4	38	0.7	0.26	Copacked (FRED)	TO-247
IXYN82N120C3	1200	105	46	3.2	95	3.7	0.25	Single	SOT-227B
IXYN82N120C3H1	1200	105	46	3.2	95	3.7	0.25	Copacked (FRED)	SOT-227B
IXYH50N120C3	1200	100	50	3.5	60(T_J=150 °C)	1.4	0.2	Single	TO-247
IXYH50N120C3D1	1200	90	50	4	60(T_J=150 °C)	1.4 (T_J=150 °C)	0.2	Copacked (FRED)	TO-247
IXYR100N120C3	1200	104	58	3.5	125	3.55	0.32	Single	ISOPLUS247
IXYN100N120C3H1	1200	134	62	3.5	125	3.55	0.18	Copacked (FRED)	SOT-227B
IXYB82N120C3H1	1200	160	82	3.2	95	3.7	0.12	Copacked (FRED)	PLUS264
IXYH82N120C3	1200	160	82	3.2	95	3.7	0.12	Single	TO-247
IXYN100N120C3	1200	152	86	3.5	125	3.55	0.18	Single	SOT-227B
IXYK100N120C3	1200	188	100	3.5	125	3.55	0.13	Single	TO-264
IXYX100N120C3	1200	188	100	3.5	125	3.55	0.13	Single	PLUS247
IXYK120N120C3	1200	220	120	3.5	120(T_J=150 °C)	5.3 (T_J=150 °C)	0.1	Single	TO-264
IXYX120N120C3	1200	220	120	3.5	120(T_J=150 °C)	5.3 (T_J=150 °C)	0.1	Single	PLUS247

Applications

Well-suited for high-speed hard-switching applications (up to 50kHz)

- Power inverters
- Uninterruptible Power Supplies (UPS)
- Switch-mode power supplies
- Power Factor Correction (PFC) circuits
- Battery chargers
- Welding machines
- Lamp ballasts



Punch Through (PT) vs. Extreme-Light Punch Through (XPT™)

XPT™ IGBTs have:

- lower turn-on and turn-off energy losses
- lower gate drive requirements
- lower thermal resistance (R_{thJC})
- higher power density

	IXGH40N120C3 (IXYS)	IXYH40N120C3 (IXYS)
Technology	**GenX3™ PT**	**GenX3™ XPT™**
V_{CES}	1200V	1200V
I_C @ T_c=110 °C	40A	40A
$V_{CE(sat)}$ @ T_j=25 °C	4.4V	4V
Anti-parallel diode	No	No
$Q_{g(on)}$	142nC	85nC
C_{ies}	2930pF	1880pF
C_{oes}	225pF	115pF
E_{off} @ T_j=125 °C	1.6mJ	0.7mJ
R_{thJC}(max)	0.33 °C/W	0.26 °C/W
P_C	380W	577W
Package type	TO-247	TO-247