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IXYS SEMICONDUCTOR GMBH

E72873

Edisonstrasse 15
68623 Lampertheim, GERMANY

Electrically Isolated Semiconductor Device, Model(s) GBO25-12NO1, GBO25-16NO1

Power Switching Semi-Conductors, "ISOPLUS-247 package", Model(s) C, D, I or M followed by additional numbers and letters, followed by HI, HJ, HQ or HR.

Power Switching Semi-Conductors, "ISOPLUS-247 package", Model(s) CS or DS followed by up to 10 numbers and letters, followed by R.

Power Switching Semi-Conductors, "ISOPLUS-i4", Model(s) C, D, I or M followed by two letters, followed by additional numbers and letters, followed by FB, FC, FD or FE.

Power switching semi-conductors, "ISOPLUS-i4", Model(s) CS#

Power Switching Semi-Conductors, "ISOPLUS-i4", Model(s) CS, DH, DS followed by up to 15 numbers and letters, followed by F or F1.

Power switching semi-conductors, "ISOPLUS-i4", Model(s) DS#, DSE#, FBE#, FBO#, FBS#, FCC#, FCD#, FDC#, FDD#, FDI#, FDM#, FEE#, FID#, FII#, FIO#, FMD#, FMK#, FMM#, FRR#, FSS#, FUE#, FUO#, FUS#, IXBF#, IXDF#, IXEF#, IXFF#, IXGF#, IXKF#, IXL#, IXSF#, IXUF#

Power Switching Semi-Conductors, "ISOPLUS220 package", Model(s) C, D, I or M followed by additional numbers and letters, followed by PI or PJ.

Power Switching Semi-Conductors, "ISOPLUS220 package", Model(s) CS, DS or DG followed by numbers and letters, followed by C.

Power switching semi-conductors, Model(s) 40370-32*

Power Switching Semi-Conductors, Model(s) C, D, I or M followed by two letters, followed by additional numbers and letters, followed by NA.

Power Switching Semi-Conductors, Model(s) C, D, I, and M followed by numbers and/or letters, followed by GU, GV, GW, GX, GY or GZ.

Power Switching Semi-Conductors, Model(s) C, D, I, and M followed by numbers and/or letters, followed by LA, LB, LC, or LD.

Power Switching Semi-Conductors, Model(s) CS followed by additional letters and/or numbers, followed by M.

Power Switching Semi-Conductors, Model(s) D followed by additional letters and/or numbers, followed by M.

Power Switching Semi-Conductors, Model(s) D, C, M or I followed by additional letters and/or numbers, followed by PN or PM.

Power Switching Semi-Conductors, Model(s) DS followed by additional letters and/or numbers, followed by M.

Power switching semi-conductors, Model(s) DSEI....P, DSEK....P

Power Switching Semi-Conductors, Model(s) GUO followed by numbers, followed by "-", followed by numbers, followed by NO1.

Power Switching Semi-Conductors, Model(s) ISOPLUS-264 Models C, D, I or M, followed by two letters, followed by additional numbers and letters, followed by KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV. Models IXBL, IXFL, IXTL or LKK, followed by additional numbers and letters

Power Switching Semi-Conductors, Model(s) IX (single phase) followed by two numbers, followed by MB, followed by three numbers.

Power Switching Semi-Conductors, Model(s) IX (three phase) followed by two numbers, followed by MT, followed by three numbers.

Power Switching Semi-Conductors, Model(s) IX followed by additional letters and/or numbers, followed by M.

Power Switching Semi-Conductors, Model(s) M followed by two letters, followed by additional numbers and letters, followed by JA, JB, JC, JD or JE.

Power Switching Semi-Conductors, Model(s) MC and M followed by two letters, followed by additional numbers or letters, followed by VB or VC.

Power Switching Semi-Conductors, Model(s) MC, MD, MI or MM followed by two letters, followed by additional numbers and letters, followed by ED, EH, SF, or SH.

Power Switching Semi-Conductors, Model(s) MC, MD, MI or MM followed by two letters, followed by additional numbers and letters, followed by ML or MH.

Power Switching Semi-Conductors, Model(s) MC, MD, MI or MM followed by two letters, followed by additional numbers and letters, followed by TA, TB, TC, TD, TE, TF, or TG.

Power Switching Semi-Conductors, Model(s) MC, MD, MI or MM followed by two letters, followed by additional numbers and letters, followed by VA.

Power Switching Semi-Conductors, Model(s) MC, MD, MI or MM followed by two letters, followed by additional numbers and letters, followed by YA, YB, YC, YD, YE,YF, YI, YJ, YK or YL.

Power Switching Semi-Conductors, Model(s) MC, MD, MI, and MM followed by 8 to 10 alphanumeric characters, followed by MI.

Power Switching Semi-Conductors, Model(s) MC, MD, MI, and MM followed by 8 to 10 alphanumeric characters, followed by SA.

Power Switching Semi-Conductors, Model(s) MC, MD, MI, and MM followed by 8 to 11 alphanumeric characters, followed by CA, CB, CC, CD, CE, CF, CG, CH.

Power Switching Semi-Conductors, Model(s) MC, MD, MI, or MM followed by two letters, followed by additional numbers and letters, followed by KA, KB, KC, KD or KE.

Power Switching Semi-Conductors, Model(s) MC, MD, MI, or MM followed by two letters, followed by additional numbers or letters, ending with VH.

Power Switching Semi-Conductors, Model(s) MCC, MCD, MCK, MDC, or MDD followed by 120 through 200.*

Power Switching Semi-Conductors, Model(s) MCC, MCD, MDA, MDC, or MDD followed by numbers between 19 and 100.*

Power Switching Semi-Conductors, Model(s) MCC, MCD, MDC, or MDD followed by 170 through 350.*

Power switching semi-conductors, Model(s) MCC165*, MCC220*, MCC250*, MCC310*, MCD165*, MCD220*, MCD250*, MCD310*

Power switching semi-conductors, Model(s) MCO or MDO, followed by 400 through 650.*

Power switching semi-conductors, Model(s) MDC165*, MDC220*, MDC250*, MDC310*, MDD165*, MDD220*, MDD250*, MDD310*

Power Switching Semi-Conductors, Model(s) MDI followed by 90 through 1550*

Power switching semi-conductors, Model(s) MDI, MID or MII, followed by 20 through 150.*

Power Switching Semi-Conductors, Model(s) MEA, MEE, MEK, MPK or MEO followed by numbers between 50 and 240.*

Power Switching Semi-Conductors, Model(s) MEA, MEE, MEK, or MEO followed by 150 through 600.*

Power Switching Semi-Conductors, Model(s) MID followed by 90 through 1550*

Power Switching Semi-Conductors, Model(s) MIE followed by 90 through 1550*

Power Switching Semi-Conductors, Model(s) MII followed by 90 through 1550*

Power Switching Semi-Conductors, Model(s) MIO followed by 90 through 1550*

Power switching semi-conductors, Model(s) MIO, VIO or VMO, followed by 200 through 1200.*

Power switching semi-conductors, Model(s) MLO 100*, MLO 36*, MLO 50*, MLO 75*, MLO....7, MMO 36*, MMO 50*, MMO 75*

Power Switching Semi-Conductors, Model(s) MMO, MCO, MCD followed by additional numbers, followed by io1 or io6.

Power switching semi-conductors, Model(s) MMO....7

Power Switching Semi-Conductors, Model(s) MUBW, MWI or MKI followed by additional numbers and/or letters, followed by 7or 8, may be followed by T.

Power Switching Semi-Conductors, Model(s) MUBW, MWI, or MKI followed by additional numbers and /or letters, followed by 6K.

Power Switching Semi-Conductors, Model(s) MWI followed by additional numbers and/or letters, followed by 9.

Power Switching Semi-Conductors, Model(s) MWI followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power Switching Semi-Conductors, Model(s) VBBW followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VBE*, VBE.. .NO7

Power Switching Semi-Conductors, Model(s) VBEF followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power Switching Semi-Conductors, Model(s) VBH followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VBO or VUO, followed by 10 through 125.*

Power switching semi-conductors, Model(s) VBO or VUO, followed by 50 through 100.*

Power switching semi-conductors, Model(s) VBO...7, VBO...NO7, VBO13*, VBO14*, VBO15*, VBO16*, VBO17*, VBO18*, VBO19*, VBO20*, VBO21*, VBO22*, VBO23*, VBO24*, VBO25*, VBO26*, VBO27*, VBO28*, VBO29*, VBO30*, VBO31*, VBO32*, VBO33*, VBO34*, VBO35*, VBO36*, VCA....7, VCC....7, VCD....7, VCK....7, VCO....7

Power Switching Semi-Conductors, Model(s) VDD may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power Switching Semi-Conductors, Model(s) VDI followed by 90 through 1550*

Power switching semi-conductors, Model(s) VDI...P1, VDI100*, VDI25*, VDI50*, VDI75*, VEE*, VGO...7, VH013*, VH014*, VH015*, VH016*, VH017*, VH018*, VH019*, VH020*, VH021*, VH022*, VH023*, VH024*, VH025*, VH026*, VH027*, VH028*, VH029*, VH030*, VH031*, VH032*, VH033*, VH034*, VH035*, VHF*, VHF...7, VHF13*, VHF14*, VHF15*, VHF16*, VHF17*, VHF18*, VHF19*, VHF20*, VHF21*, VHF22*, VHF23*, VHF24*, VHF25*, VHF26*, VHF27*, VHF28*, VHF29*, VHF30*, VHF31*, VHF32*, VHF33*, VHF34*, VHF35*, VHF36*, VHF*, VHM...7, VHO....7

Power Switching Semi-Conductors, Model(s) VID followed by 90 through 1550*

Power Switching Semi-Conductors, Model(s) VID may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power switching semi-conductors, Model(s) VID....P1, VID100*, VID25*, VID50*, VID75*

Power Switching Semi-Conductors, Model(s) VIE followed by 90 through 1550*

Power Switching Semi-Conductors, Model(s) VII followed by 90 through 1550*

Power switching semi-conductors, Model(s) VII....7, VII....P1, VII100*, VII25*, VII50*, VII75*, VIO....P1, VK013*, VK014*, VK015*, VK016*, VK017*, VK018*, VK019*, VK020*, VK021*, VK022*, VK023*, VK024*, VK025*, VK026*, VK027*, VK028*, VK029*, VK030*, VK031*, VK032*, VK033*, VK034*, VK035*, VK036*, VKI....7, VKI....P1, VKM...7, VKO....7

Power Switching Semi-Conductors, Model(s) VMD may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power Switching Semi-Conductors, Model(s) VMH may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power Switching Semi-Conductors, Model(s) VMK, VMM, or VMO followed by numbers between 25 and 250.*

Power Switching Semi-Conductors, Model(s) VMM followed by 90 through 1550*

Power Switching Semi-Conductors, Model(s) VMM may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power switching semi-conductors, Model(s) VMO....P1, VTO....7

Power Switching Semi-Conductors, Model(s) VUB followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VUB*

Power Switching Semi-Conductors, Model(s) VUB, VUO, or VVZB followed by additional numbers and/or letters, followed by NO1, NOX or ioX, may be followed by T.

Power switching semi-conductors, Model(s) VUB...P1, VUB...PO1, VUBM....P1

Power Switching Semi-Conductors, Model(s) VUBW followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VUC*

Power Switching Semi-Conductors, Model(s) VUC15 may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power Switching Semi-Conductors, Model(s) VUC25 may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power Switching Semi-Conductors, Model(s) VUC36 may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power switching semi-conductors, Model(s) VUCB*, VUE*, VUE.. .NO7, VUI*, VUI....N7

Power Switching Semi-Conductors, Model(s) VUM followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VUM*, VUM.....N7

Power Switching Semi-Conductors, Model(s) VUM24 may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power Switching Semi-Conductors, Model(s) VUM33 may be followed by 15, 24, 25, 33, or 36, followed by 05, 12, 14, 16, 500, 1200, 1400, or 1600, may be followed by G02, E, N01, N, PH *

Power Switching Semi-Conductors, Model(s) VUO followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VUO*, VUO...7, VUO...NO7, VUO30*, VUO50*, VUO60*

Power Switching Semi-Conductors, Model(s) VVBW followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VVY*, VVY12*, VVY24*, VVY40*

Power Switching Semi-Conductors, Model(s) VVZ followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VVZ*, VVZ....7, VVZ12*, VVZ24*, VVZ40*

Power Switching Semi-Conductors, Model(s) VVZB followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VW2X*, VW3....7, VWI....P1

Power Switching Semi-Conductors, Model(s) VWM followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VWM....7

Power Switching Semi-Conductors, Model(s) VWO followed by additional numbers and/or letters, followed by A5, DL1, io1, io2, ioX, NO1, NO2, or NOX, may be followed by T

Power switching semi-conductors, Model(s) VWO....7, VZI....P1

Power switching semi-conductors, package SOT-227B, miniBloc, Model(s) DH1X*, DH2X*, DSEI*, DSEP*, DSI*, DSS*, IXDN*, IXEN*, IXFN*, IXGN*, IXKN*, IXLN*, IXSN*, IXTN*, IXUN*, VBE*, VBO*, VBS*

Semi-conductor diodes, thyristors, IGBTs or MOSFETS, "ISOPLUS-247 package", Model(s) IXDR%, IXER%, IXFR%, IXKR%

Semi-conductor diodes, thyristors, IGBTs or MOSFETS, "ISOPLUS220 package", Model(s) IXKC*

- Followed by up to 15 numbers and letters.

% - Followed by up to 10 numbers and letters.

* - May be followed by additional numbers or letters.



Marking: Company name or trademark  and model designation.

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IXYS CORP

E153432

1590 BUCKEYE DR
MILPITAS, CA 95035-7418 USA

Power Switching Semi-Conductors, Model(s) CS followed by additional letters and/or numbers, followed by M.

Power Switching Semi-Conductors, Model(s) D followed by additional letters and/or numbers, followed by M.

Power Switching Semi-Conductors, Model(s) D, C, M or I followed by additional letters and/or numbers, followed by PN or PM.

Power Switching Semi-Conductors, Model(s) DS followed by additional letters and/or numbers, followed by M.

Power Switching Semi-Conductors, Model(s) IX followed by additional letters and/or numbers, followed by M.

Power Switching Semi-Conductors, Model(s) IX followed by an upper case letter, followed by N, followed by any number 01 through 99999, followed by additional numbers and letters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, ISO247 package, Model(s) IX J Series IX, followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by J, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, ISOPLUS I4-PAC package, Model(s) IX F Series IX, followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by F, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, ISOPLUS SMPD package, Model(s) IXM2001 IX, followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by L, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, ISOPLUS SMPD package, Model(s) MDIX4X30N65B3 IX, followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by L, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, ISOPLUS SMPD package, Model(s) MMIX IX, followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by L, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, ISOPLUS SMPD package, Model(s) MMIX1992 IX, followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by L, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, ISOPLUS220 package, Model(s) IX followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by C, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, ISOPLUS264 package, Model(s) IX L Series IX, followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by L, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

Semi-conductor diodes, thyristors, IGBT or MOSFETS, SSMPD package, Model(s) MMJX MMJX, followed by 1, 2, 3, followed by B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by number 1-999, followed by N or P, followed by number 1-800, may be followed by up to 6 alpha-numeric characters.

Semi-conductor diodes, thyristors, or MOSFETS, 247 hole-less package, Model(s) DSE (a), IXBR (a), IXGR (a), IXL R (a), IXSR (a), IXTR (a)

Semi-conductor diodes, thyristors, or MOSFETS, ISOPLUS247 package, Model(s) IX followed by one letter B, C, D, E, F, G, H, K, L, S, T, U, X, or Y, followed by R, may be followed by 01-09, 1R1-1R9, 1-9, 10-99, or 100-999 may be followed by N or P, may be followed by 01-10, 1-99 or 100-800, may be followed by up to six alpha-numeric characters.

(a) - Followed by up to 10 numbers and letters.

Marking: Company name and model designation.

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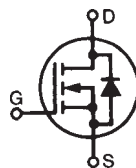
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PolarHV™ HiPerFET IXFC 36N50P Power MOSFET IXFR 36N50P (Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

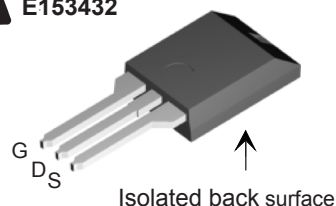


$$\begin{aligned} V_{DSS} &= 500 \text{ V} \\ I_{D25} &= 19 \text{ A} \\ R_{DS(on)} &\leq 190 \text{ m}\Omega \\ t_{rr} &\leq 200 \text{ ns} \end{aligned}$$

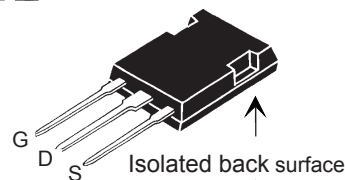
Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$	500	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ\text{C}$	19	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	100	A
I_{AR}	$T_C = 25^\circ\text{C}$	36	A
E_{AR}	$T_C = 25^\circ\text{C}$	50	mJ
E_{AS}	$T_C = 25^\circ\text{C}$	1.5	J
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 4 \Omega$	20	V/ns
P_D	$T_C = 25^\circ\text{C}$	156	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
T_L	1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS, 1 minute	2500	V~
F_C	Mounting Force	(IXFC) 11..65 / 2.5..15 (IXFR) 20..120 / 4.5..25	N/lb N/lb
Weight	(IXFC)	3	g
	(IXFR)	5	g

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	2.5		5.0 V
I_{GSS}	$V_{GS} = \pm 30 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			25 μA 250 μA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = I_T$			190 $\text{m}\Omega$

ISOPLUS220™ (IXFC)
E153432



ISOPLUS247™ (IXFR)
E153432



G = Gate
S = Source
D = Drain

Features

- International standard isolated packages
- UL recognized packages
- Silicon chip on Direct-Copper-Bond substrate
 - High power dissipation
 - Isolated mounting surface
 - 2500V electrical isolation
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
 - easy to drive and to protect
- Fast intrinsic diode

Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 20\text{ V}; I_D = I_T$, Note 1	23	35	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		5500	pF
C_{oss}			510	pF
C_{rss}			40	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 I_{D25}$ $R_G = 4\ \Omega$ (External)		29	ns
t_r			23	ns
$t_{d(off)}$			82	ns
t_f			23	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = I_T$		93	nC
Q_{gs}			30	nC
Q_{gd}			31	nC
R_{thJC}	(ISOPLUS 247) (ISOPLUS 220)		0.75	$^\circ\text{C/W}$
R_{thCS}			0.15 0.21	$^\circ\text{C/W}$ $^\circ\text{C/W}$

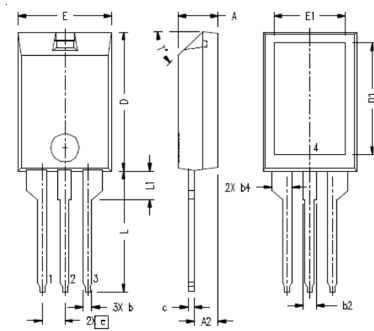
Source-Drain Diode

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{ V}$			36 A
I_{SM}	Repetitive			100 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V},$			1.5 V
t_{rr}	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}; V_{GS} = 0\text{ V}$		8	200 ns
I_{RM}				A
Q_{RM}				0.6 μC

Notes:

1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$;
2. Test current $I_T = 18\text{ A}$.

ISOPLUS220™ (IXFC) Outline

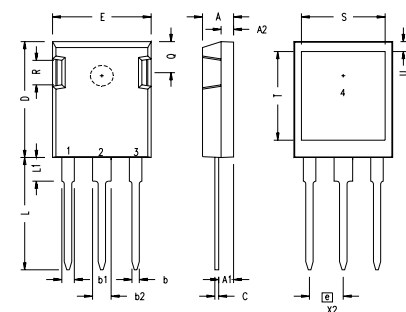


Note:
Bottom heatsink (Pin 4) is electrically isolated from Pin 1, 2, or 3.

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100 BASIC		2.55	BASIC
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T*			42.5*	47.5*

Ref: IXYS CO 0177 R0

ISOPLUS247 Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45	BSC
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

- 1 - GATE
- 2 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)
- 4 - NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585
one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692
4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2

Fig. 1. Output Characteristics
@ 25°C

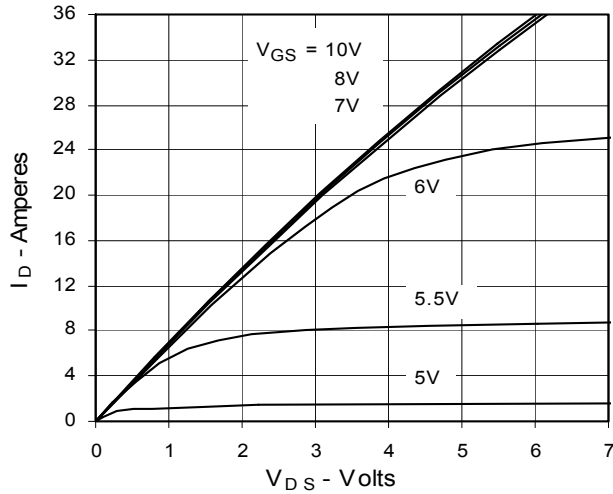


Fig. 2. Extended Output Characteristics
@ 25°C

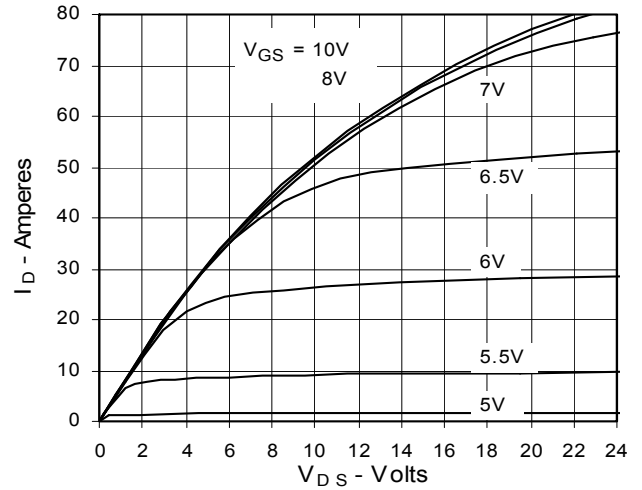


Fig. 3. Output Characteristics
@ 125°C

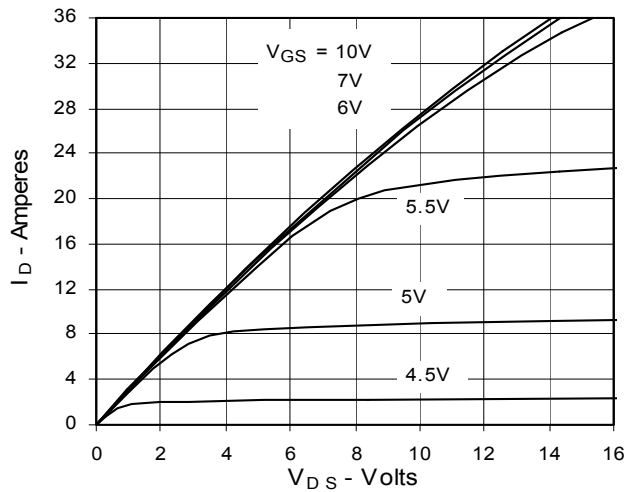


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 18A$
Value vs. Junction Temperature

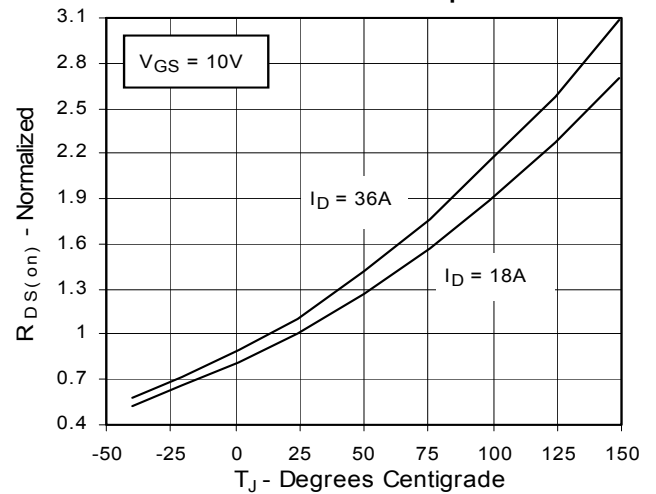


Fig. 5. $R_{DS(on)}$ Normalized to
 $I_D = 18A$ Value vs. Drain Current

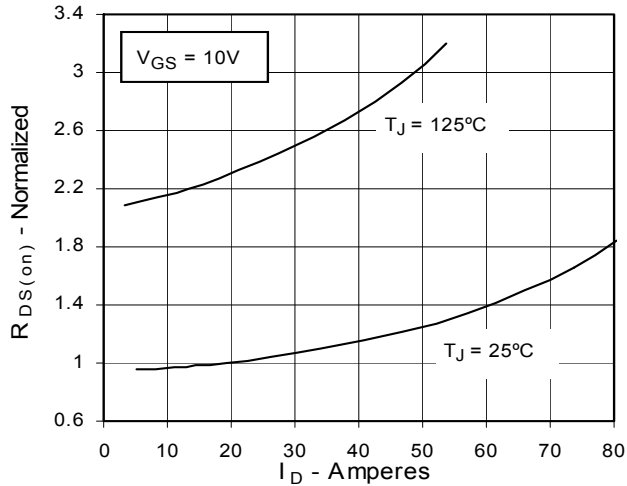


Fig. 6. Drain Current vs. Case
Temperature

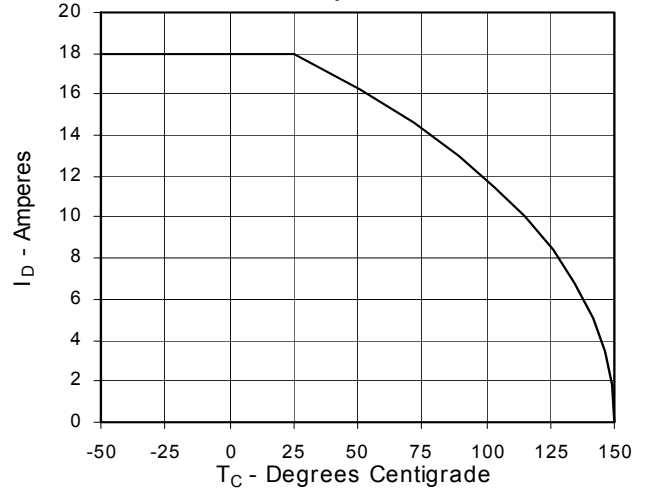


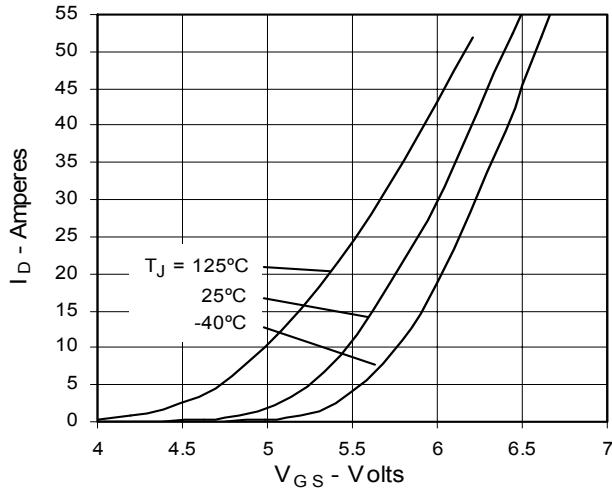
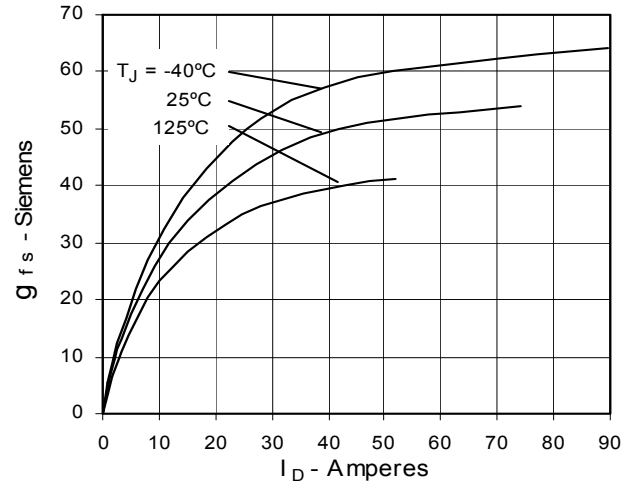
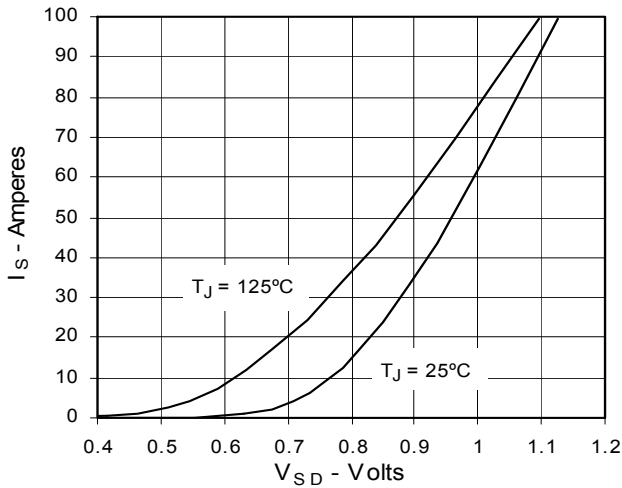
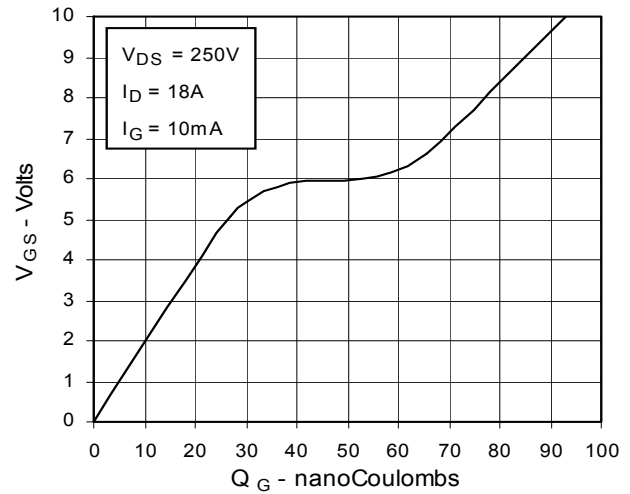
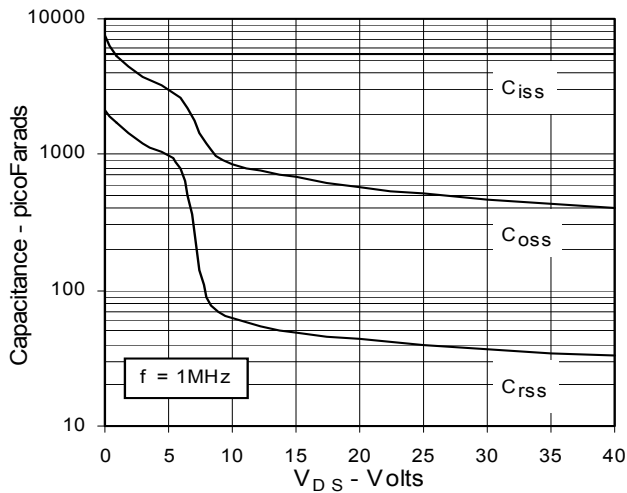
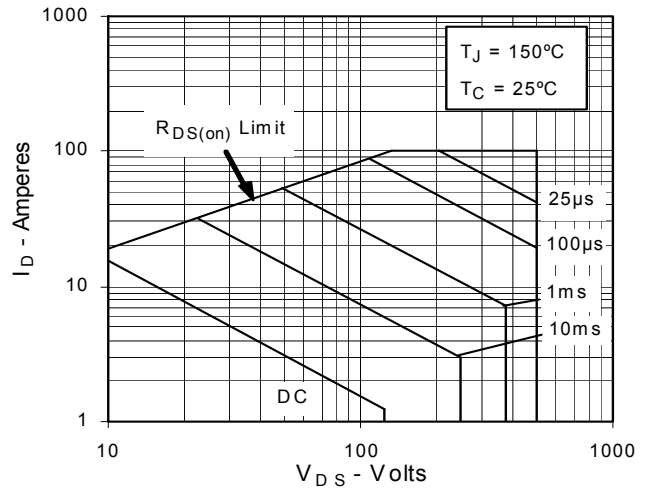
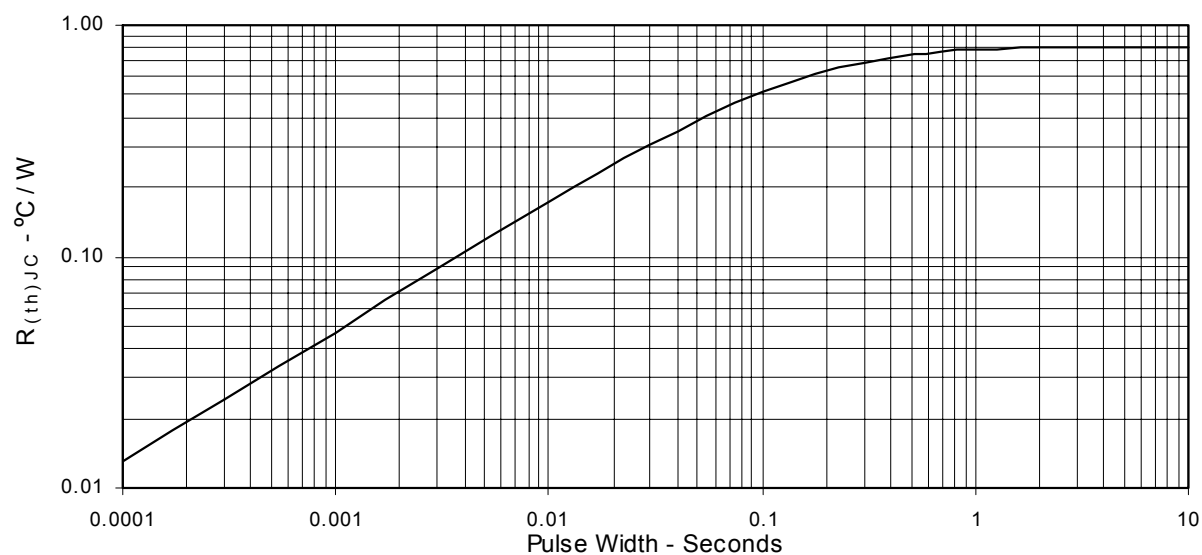
Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Source Current vs. Source-To-Drain Voltage

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Forward-Bias Safe Operating Area


Fig. 13. Maximum Transient Thermal Resistance

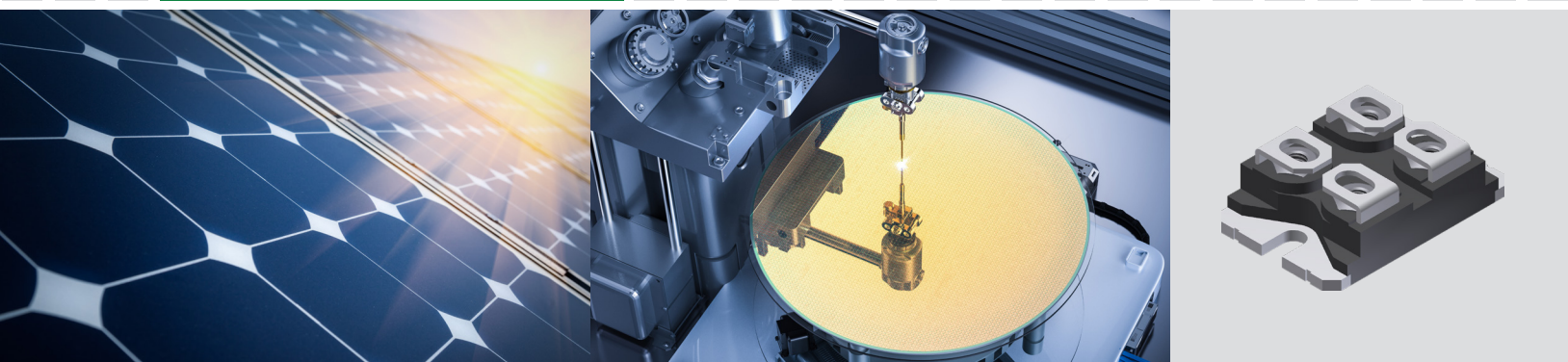




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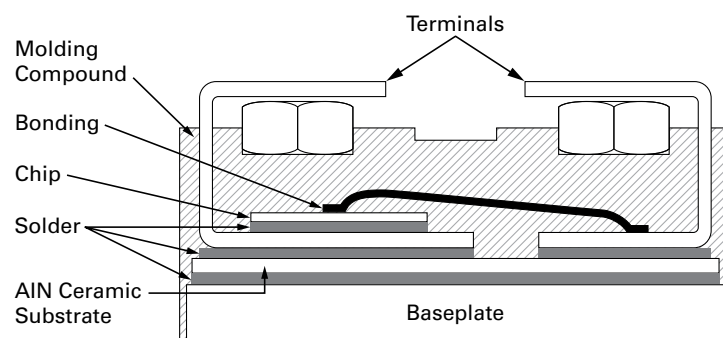
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Isolated **miniature** power **BLOCK** (miniBLOC™) solution for Plasma Power Supplies

Littelfuse's isolated miniBLOC™ (SOT-227B) is a discrete miniature power BLOCK, conveniently bridging the power gap between inexpensive discrete packages and full-sized power modules. Littelfuse offers a wide range of Si and SiC miniBLOC™ MOSFET solutions catering to the design demands of plasma power supplies.

The miniBLOC™ solution offering fully isolated base plate, higher power densities, faster switching speeds, wide device choice, ease of application, and long-term reliability will serve as a key enabler, providing the right solution to development needs at different power levels.



Cross-section of SOT-227B (miniBLOC)

The **miniature** power **BLOCK** Advantage

Features

- Aluminum Nitride ceramic-based compact discrete package with electrically isolated baseplate
- Reduced overall junction-sink thermal impedance in comparison to non-isolated discretes
- Isolation up to 2.5 kV $V_{RMS}/60$ s or 3 kV $V_{RMS}/1$ s
- Extended creepage and clearance distances:
 - Terminal-terminal: clearance of up to 7 mm and creepage of up to 10.5 mm
 - Terminal-baseplate: clearance of up to 8.5 mm and creepage of up to 10.5 mm
- Discrete power block with high current-handling capability
- Low internal lead inductance < 5 nH
- Option for Kelvin-Source terminal
- Screw-mounted discrete package with four screwed terminal leads

Advantages

- Aluminum Nitride internal isolation increases power density, simplifies thermal design, improves reliability, and enables superior power cycling capability with cooler chip temperatures compared to non-isolated and conventionally isolated discretes
- Optimal for high-voltage design given the inherent isolation and extended creepage and clearance
- Reduced paralleling effort and decreased part count resulting in PCB space savings
- Higher safety overvoltage margin with reduced overvoltage stress at chip level due to lower package stray inductance
- Kelvin-Source terminal improves controllability, enabling faster switching speeds
- Rugged and stable mounting, ease of manufacturing and handling in assembly

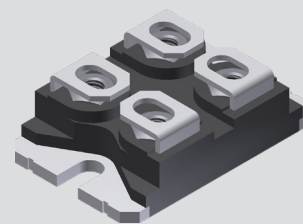
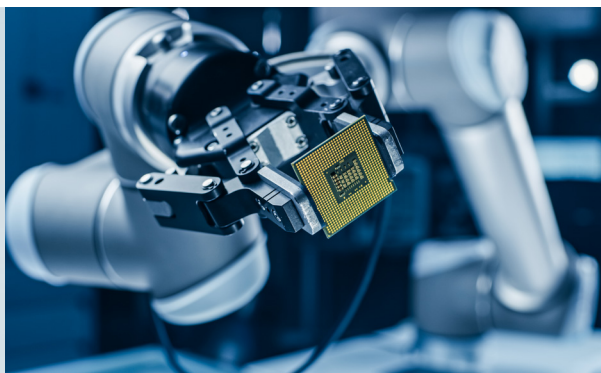
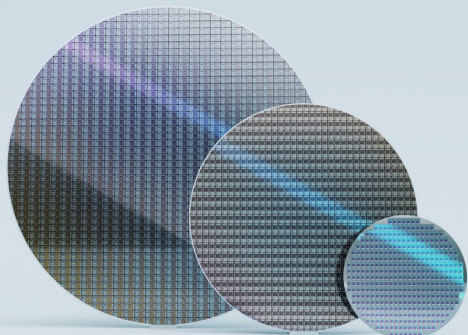
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High Current (> 50 A), 650 V Ultra Junction X2-Class MOSFETs in miniBLOC™

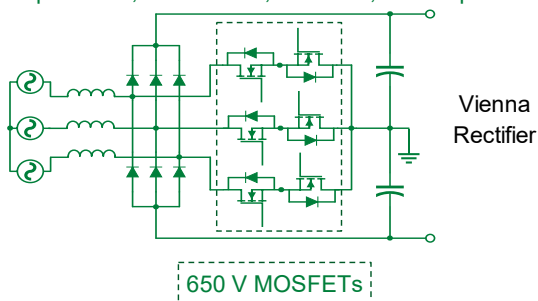
$R_{DS(on),max}$ [mΩ]	I_{D25} [A]	miniBLOC™ 
13	170	IXFN170N65X2 ●
17	145	IXFN150N65X2 ●
24	108	IXFN120N65X2 ●
30	78	IXFN100N65X2 ●
30	76	IXTN102N65X2 ●

- HiPerFET™ (fast-body diode)
- Standard body diode

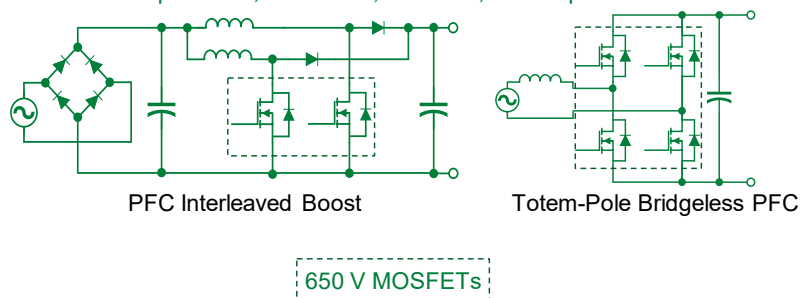
The 650 V X2-Class Ultra Junction MOSFETs in miniBLOC™ package from Littelfuse exhibit some of the highest current ratings, lowest on-state resistances $R_{DS(on)}$, low gate charge Q_g , and superior dv/dt performance. Their superior avalanche capability further enhances device ruggedness in critical applications. Additionally, the HiPerFET™ devices with fast soft-recovery body diode have reduced switching losses and a better electromagnetic interference (EMI) behavior.

These benefits of the 650 V Ultra Junction X2-Class MOSFETs in combination with the advantages offered by the miniBLOC™ package make them a preferred choice for plasma power supplies.

AC Input: 3-Ph, 170 - 480 V, 50/60 Hz; DC Output: 600 - 800 V



AC Input: 1-Ph, 85 - 265 V, 50/60 Hz; DC Output: < 400 V



Scan this QR code to access the Littelfuse webpage on Ultra Junction X2-Class MOSFETs

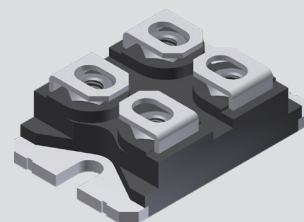
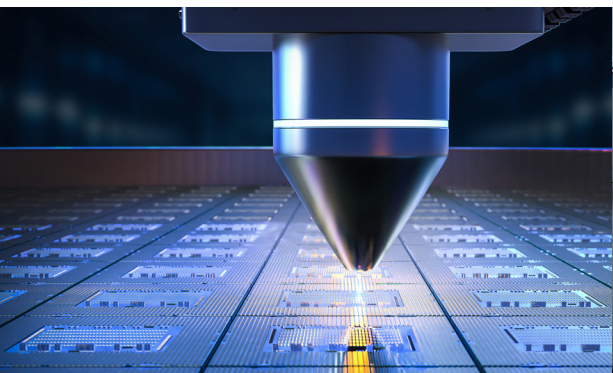


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900–1200 V Polar™ HiPerFET™ in miniBLOC™

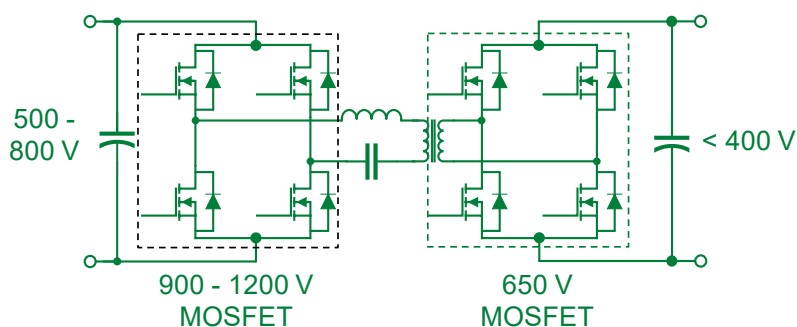
$R_{DS(on),max}$ [Ω]	I_{D25} [A]	V_{DSS} [V]	miniBLOC™ 
0.145	56	900	IXFN56N90P
0.160	43	900	IXFN52N90P
0.230	33	900	IXFN40N90P
0.21	38	1000	IXFN38N100P
0.22	37	1000	IXFN44N100P
0.32	27	1000	IXFN32N100P
0.39	23	1000	IXFN26N100P
0.26	34	1100	IXFN40N110P
0.31	32	1200	IXFN32N120P
0.35	30	1200	IXFN30N120P
0.46	23	1200	IXFN26N120P
0.57	20	1200	IXFN20N120P

Littelfuse 900–1200 V Polar™ HiPerFET™ devices are tailored to provide designers with a rugged device solution that offers the best advantage in performance and cost in high frequency applications.

These devices incorporate the Polar technology platform to achieve low on-state resistances $R_{DS(on)}$ which improves conduction behavior. The low gate charge Q_g and fast body diode results in more efficient switching at all frequencies. The dv/dt and avalanche capabilities of these devices provide additional safeguards against overvoltage transients.

The benefits of the Polar™ HiPerFET™ devices, in addition to the advantages offered by the miniBLOC™ package, make them the best solution for plasma power supplies.

DC/DC LLC Converter



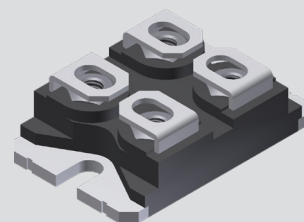
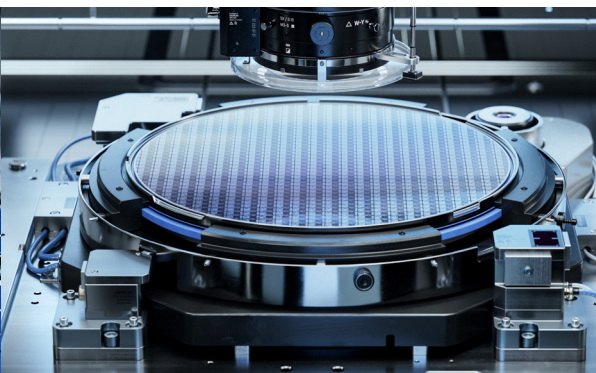
Scan this QR code to access the Littelfuse webpage on Polar HiPerFET™ devices

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1200 V SiC MOSFETs in miniBLOC™ with Kelvin-Source

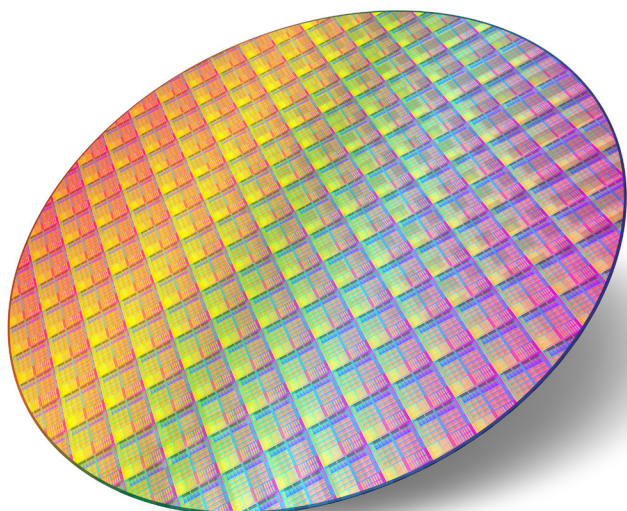
$R_{DS(on),max}$ [mΩ]	I_{D25} [A]	V_{DSS} [V]	miniBLOC™ w/ Kelvin-Source 
10	130	900	IXFN130N90SK
21	75	1200	IXFN75N120SK
32	55	1200	IXFN55N120SK
75	30	1200	IXFN30N120SK

Note: Preliminary datasheet and engineering samples available for the SiC MOSFETs in the table above

Littelfuse 1200 V SiC MOSFETs featuring low $R_{DS(on)}$ and low device capacitances, offer the highest efficiency for reduced cooling effort. The excellent conduction and switching behavior combined with higher frequency operation improves power density in the application.

The SiC MOSFETs in miniBLOC™ featuring a Kelvin-Source connection offer superior immunity to parasitic turn-on/turn-off events, thereby maximizing the high-speed switching performance of the MOSFET.

These advantages of SiC MOSFETs combined with the benefits offered by the miniBLOC™ package make them a preferred choice in Plasma Power Supplies.



Scan this QR code to access
the Littelfuse webpage on
SiC MOSFETs

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