



(51) International Patent Classification:
G01J 3/40 (2006.01)

(21) International Application Number:
PCT/US2011/030394

(22) International Filing Date:
29 March 2011 (29.03.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/318,738 29 March 2010 (29.03.2010) US

(71) Applicant (for all designated States except US): INTE-
VAC, INC. [US/US]; 3560 Bassett Street, Santa Clara,
CA 95054 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): TRUE, Bruce
[US/US]; 1255 Cobblestone Drive, Campbell, CA 95008
(US).

(74) Agent: HAYES, Jennifer; Nixon Peabody LLP, 401 9th
Street, N.W., Suite 900, Washington, DC 20004 (US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD,
SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: TIME RESOLVED PHOTOLUMINESCENCE IMAGING SYSTEMS AND METHODS FOR PHOTOVOLTAIC
CELL INSPECTION

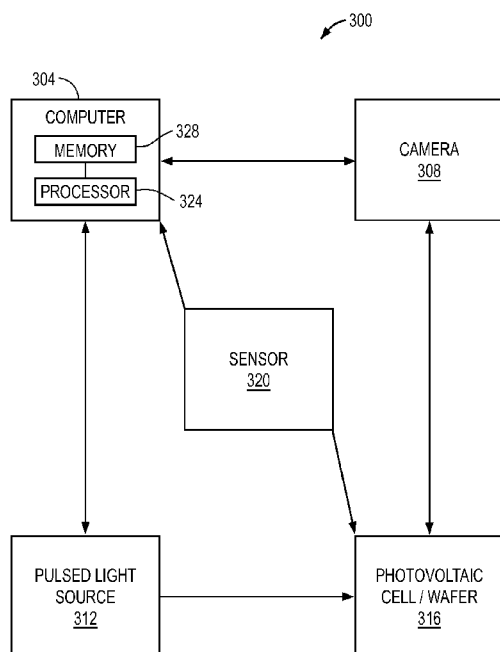


FIG. 3

(57) Abstract: A time-resolved photoluminescence technique is disclosed to image photovoltaic cells and wafers. The effective lifetime is measured directly using a photodetector that has a fast response. A pulsed light source flashes the wafer, generating excess carriers in the silicon. The rate of carrier recombination is monitored by imaging the photoluminescence decay over time. An effective lifetime can be extracted from the photoluminescence decay curve, which can be used to determine the quality of the photovoltaic cells and wafers.