

technical reprint

R/P085



photomultiplier voltage divider

## Photomultiplier Voltage Dividers

- design optimised for tube type and application
- wide range of options
- custom variants for OEM and volume users
- compact
- low cost
- high reliability

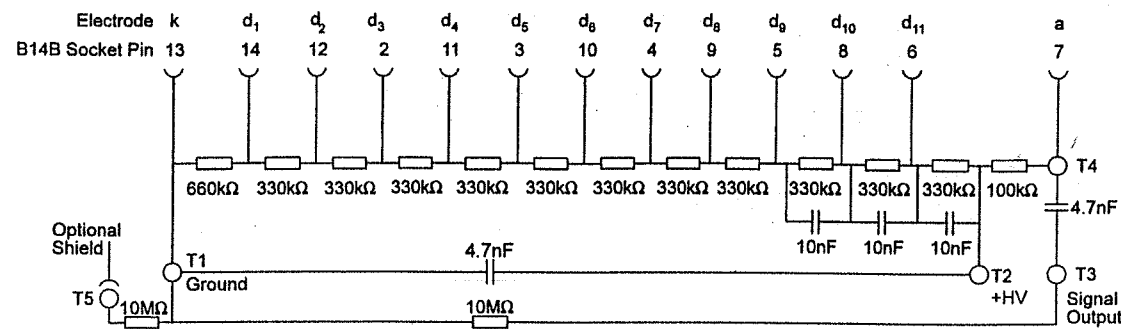
### Application

A set of voltages must be applied to the electrodes of a photomultiplier tube; these voltages can be derived from a single power supply using a resistive voltage divider.

A comprehensive range of resistive voltage divider types is offered for use with more than 50 of the most widely used photomultiplier tube types. 'Linear' voltage distribution types are intended for general purpose applications whilst a 'tapered' distribution is recommended for linear focus types used in applications involving the measurement of high peak current pulses. 'Standard' distribution dividers are offered for use with photomultiplier tubes with box and grid or venetian blind dynode structures. Zener diode stabilised k-d<sub>1</sub> voltages are available on some voltage dividers, to maintain good collection efficiency and speed of response over a wide gain range.

Please refer to the selection guide and product range data in this brochure to find the appropriate voltage divider for your tube type and application, then ask for a data sheet for the product of your choice.

For technical information on voltage divider design ask **ET Enterprises Limited** R/P069 or refer to Section 8 of the Photomultipliers and Accessories Catalogue. Alternatively, please contact our sales engineers or applications specialists for guidance on the appropriate type for your application.



Circuit example: C637A configured for positive high voltage operation.

### Options

All voltage divider types can be supplied with high voltage and signal leads, with or without connectors. Unless otherwise specified, leads are 500 mm long, URM 76 for high voltage and RG174 for signal, and connectors are SHV and BNC, respectively. All epoxy glass board types can be supplied with interstage resistance (R) in the range 100 kΩ to 10 MΩ to suit specific applications. Please contact our sales engineers or applications specialists to discuss your requirements.

### Custom Variants

Our voltage divider range is constantly being added to, so please ask if your photomultiplier tube type is not included in the Selection Guide. Alternatively a custom design may provide a cost effective solution. Custom designs can also include encapsulation within a housing to facilitate assembly within your equipment.

## Product Range

### Epoxy Glass Board Types:

Product Series	Type	Distribution										Resistance		Board Dia (mm)	Optional Socket
		k	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	---	d <sub>n-4</sub>	d <sub>n-3</sub>	d <sub>n-2</sub>	d <sub>n-1</sub>	d <sub>n</sub>	a	R (kΩ)		
C637A	Linear	2R	R	R	---	R	R	R	R	R		330	4.29	30	B14B
C637B	Standard	2R	R	R	---	R	R	R	2R	R		330	2.62	30	B14B
C637C	Tapered	2R	R	R	---	R	2R	3R	4R	3R		330	6.92	30	B14B
C638A	Linear	3R	R	R	---	R	R	R	R	R		330	4.95#	41	B19A
C638B	Tapered	3R	R	R	---	R	1.25R	1.5R	2R	3R		330	6.18#	41	B19A
C638C	Linear	300V	R	R	---	R	R	R	R	R		330	3.96#	41	B19A
C638D	Tapered	300V	R	R	---	R	1.25R	1.5R	2R	3R		330	5.19#	41	B19A
C639A	Linear	R	R	R	---	R	R	R	R	R		100	1.00	30	B11A
C646A	Linear	2R	R	R	---	R	R	R	R	R		330	3.96	30	B14B
C646B	Tapered	2R	R	R	---	R	2R	3R	4R	3R		330	6.59	30	B14B
C647A	Linear	2R	R	R	---	R	R	R	R	R		330	3.96	41	B19A
C647B	Tapered	2R	R	R	---	R	2R	3R	4R	3R		330	6.59	41	B19A
C647C	Linear	150V	R	R	---	R	R	R	R	R		330	3.30	41	B19A
C647D	Tapered	150V	R	R	---	R	2R	3R	4R	3R		330	5.93	41	B19A
C647E	Standard	2R	R	R	---	R	R	R	2R	R		330	4.29	41	B19A
C647F	Standard	150V	R	R	---	R	R	R	2R	R		330	3.63	41	B19A
C648A	Linear	3R	R	R	---	R	R	R	R	R		330	3.96	41	B19A
C648B	Tapered	3R	R	R	---	R	2R	3R	4R	3R		330	6.59	41	B19A
C648C	Linear	450V	R	R	---	R	R	R	R	R		330	2.97	41	B19A
C648D	Tapered	450V	R	R	---	R	2R	3R	4R	3R		330	5.60	41	B19A

# Total resistance shown is for 12 stage tubes; for 10 stage types subtract 0.66 MΩ and for 14 stage tubes add 0.66 MΩ.

- Construction: Combination of surface mount and conventional components on circular epoxy glass circuit board
- Polarity: Available in a positive high voltage, ac coupled version, or in a choice of two negative high voltage, dc coupled versions
- Format: Circuit board only, for direct solder connection to flying lead tubes, or fitted with tube socket, flanged or unflanged
- Terminals: Terminal posts for solder connection to high voltage supply and signal leads

### Alumina Ceramic Board Types:

Product Series	Type	Distribution										Resistance		Board Dia (mm)	Optional Socket
		k	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	---	d <sub>n-4</sub>	d <sub>n-3</sub>	d <sub>n-2</sub>	d <sub>n-1</sub>	d <sub>n</sub>	a	R (kΩ)		
C661	Tapered	3R	0.5R	R	---	R	R	R	1.6R	R		4300	56.30	21.5	None
C664	Linear	2R	1.4R	1.4R	---	R	R	R	R	R		330	4.24	18.0	None

- Construction: Combination of thick film and conventional components on circular alumina ceramic circuit board
- Polarity: Negative high voltage, dc coupled, or positive high voltage, using an external coupling capacitor
- Format: Circuit board only, for direct solder connection to flying lead tubes
- Terminals: Pads for solder connection to high voltage supply and signal leads

Selection Guide

Photomultiplier Tube Type	Voltage Divider Product Series Resistive k - d <sub>1</sub>			Voltage Divider Product Series Zener Stabilised k - d <sub>1</sub>		
	Linear	Standard	Tapered	Linear	Standard	Tapered
	9102	C646A	—	C646B	—	—
9102FL	C646A	—	C646B	—	—	—
9110FL	—	—	C661	—	—	—
9111FL	—	—	C661	—	—	—
9112FL	—	—	C661	—	—	—
9113FL	—	—	C661	—	—	—
9124	C637A	—	C637C	—	—	—
9125	C637A	—	C637C	—	—	—
9128	C637A	—	C637C	—	—	—
9129	C637A	—	C637C	—	—	—
9130	C637A	—	C637C	—	—	—
9131	C637A	—	C637C	—	—	—
9132	C637A	—	C637C	—	—	—
9136	C637A	—	C637C	—	—	—
9214	C638A	—	C638B	C638C	—	C638D
9250	C647A	—	C647B	C647C	—	C647D
9256	C647A	—	C647B	C647C	—	C647D
9256FL	C647A	—	C647B	C647C	—	C647D
9257	C647A	—	C647B	C647C	—	C647D
9257FL	C647A	—	C647B	C647C	—	C647D
9265	C648A	—	C648B	C648C	—	C648D
9266	C647A	—	C647B	C647C	—	C647D
9266FL	C647A	—	C647B	C647C	—	C647D
9301	C648A	—	C648B	C648C	—	C648D
9402	C637A	—	C637C	—	—	—
9405	C637A	—	C637C	—	—	—
9524	C637A	C637B	—	—	—	—
9780	C639A	—	—	—	—	—
9781	C639A	—	—	—	—	—
9783	C639A	—	—	—	—	—
9785	C639A	—	—	—	—	—
9794	C639A	—	—	—	—	—
9798	C637A	C637B	—	—	—	—
9813	C638A	—	C638B	C638C	—	C638D
9814	C638A	—	C638B	C638C	—	C638D
9816	C638A	—	C638B	C638C	—	C638D
9817	C638A	—	C638B	C638C	—	C638D
9821	C638A	—	C638B	C638C	—	C638D
9822	C638A	—	C638B	C638C	—	C638D
9828	C637A	C637B	—	—	—	—
9863	C638A	—	C638B	C638C	—	C638D
9878	C637A	C637B	—	—	—	—
9882FL	C664	—	—	—	—	—
9888	C637A	C637B	—	—	—	—
9893	C638A	—	C638B	C638C	—	C638D
9900	C637A	C637B	—	—	—	—
9902	C646A	—	C646B	—	—	—
9902FL	C646A	—	C646B	—	—	—
9903	C646A	—	C646B	—	—	—
9908	C637A	C637B	—	—	—	—
9921	C638A	—	C638B	C638C	—	C638D
9924	C637A	C637B	—	—	—	—
9954	C638A	—	C638B	C638C	—	C638D
9956	C647A	C647E	—	C647C	C647F	—
9972	C646A	—	C646B	—	—	—
9972FL	C646A	—	C646B	—	—	—

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