

For battery detection and monitoring, R11, R12 and Q2 reduce the output voltage to approximately 8 V when a 5 V signal is applied to R12. This allows the battery voltage to be measured, giving the state of charge.

Key Design Points

- The value of R3 sets the typical output current limit threshold given by: $R3 = 0.6 / I_{LIMIT}$.
- Rate R3 and R5 accordingly for power dissipation (1 W).
- Ensure total voltage across R3 and R5 is greater than 1.5 V at I_{LIMIT} if control to 0 V (output shorted) is required.
- Ensure voltage at cathode of D3 is >6 V at I_{LIMIT} . Add additional bias winding turns, if necessary, to maintain output current control to 0 V (output shorted).
- RT1: Philips part # 2322-640-54472.
- Select tolerance of U2, R7, R8 and R9 to give the desired overall CV tolerance (R7, R8 and R9 as 0.1%; R10 as 1% and U2 as 0.5% gives overall tolerance <2%).

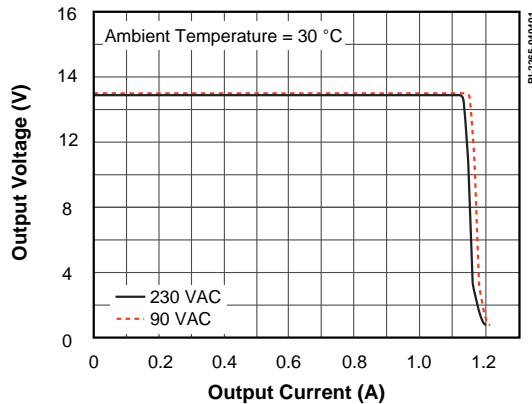


Figure 2. Output Characteristic (V_{OUT} vs I_{OUT})

TRANSFORMER PARAMETERS	
Core Material	TDK PC40 EE22/29/6-Z, Gap for $A_{LG} = 145 \text{ nH/T}^2$
Bobbin	YC 2204 (Ying Chin)
Winding Details	Primary: 56T, 30 AWG Bias: 8T, 2 x 30 AWG Secondary: 8T, 28 AWG T.I.W. (T.I.W. = Triple Insulated Wire)
Winding Order (Pin Numbers)	Primary (2-1), tape, Bias (4-3), tape, Secondary (7,8-5,6)
Inductance	Primary: 475 $\mu\text{H} \pm 10\%$, Leakage: 35 μH (maximum)
Primary Resonant Frequency	300 kHz (minimum)

Table 1. Transformer Construction Information.

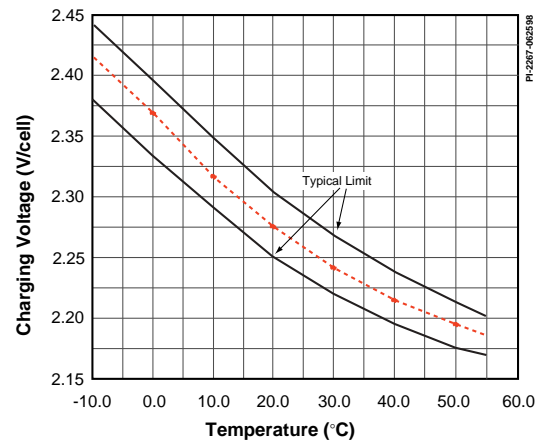


Figure 3. Cell Charging Voltage vs Temperature.

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