List of Symbols, Abbreviations

\( \rho \) = Material density (kg/m³)
\( \alpha \) = Thermal diffusivity of the material (m²/s)
\( V \) = Voltage (V)
\( I \) = Current (A)
\( \eta \) = S/N Ratio (Signal to Noise ratio)(dB)
\( C_p \) = Specific heat (J/kg K)
\( J_0 \) = Bessel functions of the first kind of zero order
\( J_1 \) = Bessel functions of the first kind of first order
\( H_0 \) = Hankel transform of order zero
\( \lambda \) = Hankel transformed variable of \( r \)
\( J_0 \) = Bessel function of order zero
\( T \) = Temperature (K)
\( \tau \) = Thermal relaxation time (\( \mu \)s)
\( C \) = Speed of thermal propagation (m/s)
\( K \) = Thermal Conductivity of the Solid (W/m K)
\( Q_f \) = Heat flux in z direction (W/m²)
\( L_m \) = Latent heat of melting (kJ/kg)
\( L_v \) = Latent heat of vaporization (kJ/kg)
\( E \) = Energy (KJ)
\( Erf \) = The error function
\( r_s \) = Radius of spark (\( \mu \)m)
\( S/N \) = Signal to Noise Ratio (dB)
\( S/N_{HB} \) = Signal to Noise Ratio Higher the better (dB)
\( S/N_{LB} \) = Signal to Noise Ratio Lower the better (dB)
\( S/N_{NB1} \) = Signal to Noise Ratio Nominal is best (Variance only) (dB)
\( S/N_{NB2} \) = Signal to Noise Ratio Nominal is best (Mean and Variance only)
\( M \) = Overall mean value for experimental region
\( Ra \) = Surface roughness value (\( \mu \)m)
\( M_{A3} \) = Average value of \( \eta \) of factor A at level 3(dB)
\( t \) = Pulse time (\( \mu \) sec)
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_{on}$</td>
<td>Spark on time ($\mu$ sec)</td>
</tr>
<tr>
<td>$T_{off}$</td>
<td>Spark off time ($\mu$ sec)</td>
</tr>
<tr>
<td>$K_N$</td>
<td>Conservation Ratio for current transducer</td>
</tr>
<tr>
<td>DAQ</td>
<td>Data acquisition card</td>
</tr>
<tr>
<td>VMMR</td>
<td>Volumetric Material Removal Rate ($mm^3/min$)</td>
</tr>
<tr>
<td>MRR</td>
<td>Material Removal Rate (g/min)</td>
</tr>
<tr>
<td>$r_o$</td>
<td>Radius of insulated surface of the workpiece (m)</td>
</tr>
</tbody>
</table>