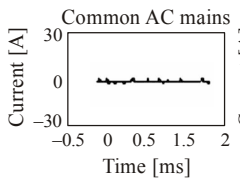
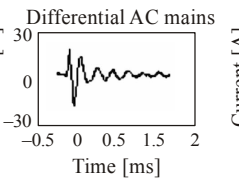
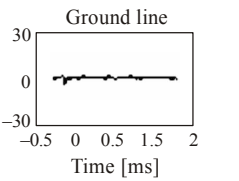
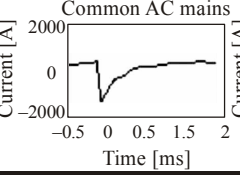
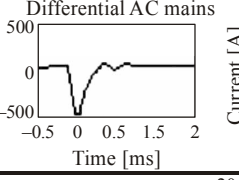
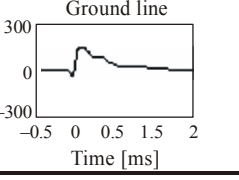
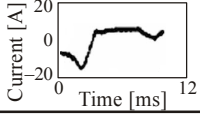


Measurement/Experiment

1) Observation

The lightning surge currents in common mode and differential mode were observed in ten systems where failure often occurred. Two types of waveform and occurrence probability were obtained. The data are summarized in Table 2.9-1 and Figure 2.9-3. Malfunctions occurred with both waveforms. The peak current values were about 30 and 300 A, respectively.

Table 2.9-1 – Observed waveforms

Type of waveform		Characteristics of waveform		
Lightning About 300 sets	Only differential mode appeared 77%	Common AC mains 	Differential AC mains 	Ground line 
	Common and differential and ground appeared 23%	Common AC mains 	Differential AC mains 	Ground line 
Other About 1200 sets	Only differential appeared	Peak current was 20 A. And the half-time value was from several milliseconds to several tens of milliseconds.		

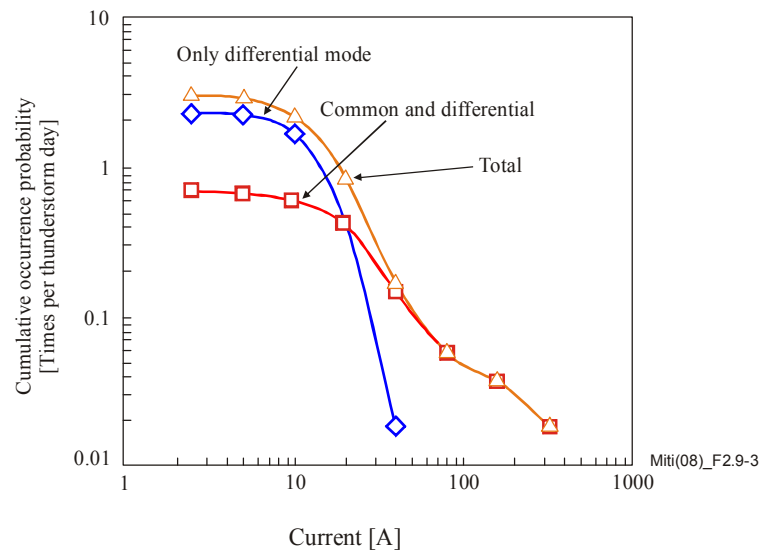


Figure 2.9-3 – Cumulative occurrence probability for differential mode current