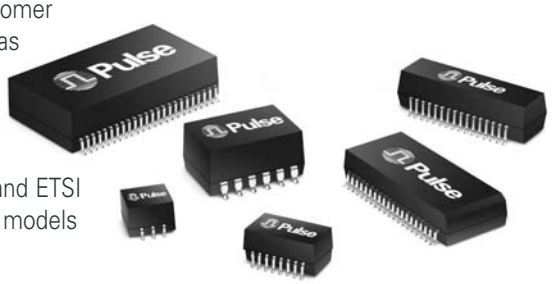
TELECOMMUNICATIONS PRODUCTS

Pulse is a leading provider of magnetics for telecom infrastructure equipment, customer premises equipment, audio interface applications, and emerging applications such as VoIP. Our broad portfolio of transformers and integrated transformer modules support T1/E1/ISDN-PRI, T3/E3/STS-1, ISDN-S, ISDN-U, Digital Audio, and DDS.



Package options include surface mount, through hole, single, dual, quad and octal covering standard and extended temperature ranges. Many parts meet ANSI, ITU and ETSI requirements, and many are recognized by UL, TUV, Austel and/or CSA. Numerous models incorporate our patented "Interlock Base" construction, ensuring high reliability.

Please see our "Telecom IC Cross Reference" section that begins on page 18.

TRANSFORMERS

T1/E1/CEPT/ISDN-Pri—SINGLE, DUAL

Part Number	RoHS-6 Part Number	Turns Ratio	Package L/W/H (in.)*	Data Sheet
SINGLE TRANSFORMERS				
1.5 kV Isolation, Standard Temperature Range, THT				
PE-64931	PE-64931NL	1:1:1 (1:2CS)	.350 / .500 / .250	T608
PE-64933	PE-64933NL	1CT:3CT	.350 / .500 / .250	T608
PE-64934	PE-64934NL	1:1	.350 / .500 / .250	T608
PE-64936	PE-64936NL	1CT:1	.350 / .500 / .250	T608
PE-64937	PE-64937NL	1:1.36	.350 / .500 / .250	T608
PE-64940	PE-64940NL	1:1:1.58	.350 / .500 / .250	T608
PE-64941	PE-64941NL	1:1:2	.350 / .500 / .250	T608
PE-64942	PE-64942NL	1:1:2.62	.350 / .500 / .250	T608
PE-64943	PE-64943NL	1CT:2CT	.350 / .500 / .250	T608
PE-65351	PE-65351NL	1:2CT	.350 / .500 / .250	T608
PE-65363	PE-65363NL	1:4CT	.350 / .500 / .250	T608
PE-65379	PE-65379NL	1:1.14CT	.350 / .500 / .250	T608
PE-65388	PE-65388NL	1:1.15CT	.350 / .500 / .250	T608
PE-65389	PE-65389NL	1:1:1.266	.350 / .500 / .250	T608
PE-65415	PE-65415NL	1CT:2CT	.350 / .500 / .250	T608
PE-65558	PE-65558NL	1:2.3CT	.350 / .500 / .250	T608
PE-65586	PE-65586NL	1:1.36CT	.350 / .500 / .250	T608
PE-65755	PE-65755NL	1CT:1CT	.350 / .500 / .250	T608
PE-68644	PE-68644NL	1CT:1	.350 / .500 / .250	T608
PE-68645	PE-68645NL	1:1.36CT	.350 / .500 / .250	T608
T1054	T1054NL	1:1.5CT	.350 / .500 / .250	T608
T1249	T1249NL	1:1.26CT	.350 / .500 / .250	T608
1.5 kV Isolation, Extended Temperature Range, THT				
PE-68664	PE-68664NL	1:1/1.26	.350 / .500 / .250	T608
PE-65340	PE-65340NL	1:1.36	.350 / .500 / .250	T608
PE-65770	PE-65770NL	1:1.15CT	.350 / .500 / .250	T608
PE-65771	PE-65771NL	1CT:2CT	.350 / .500 / .250	T608
PE-65778	PE-65778NL	1CT:1CT	.350 / .500 / .250	T608
PE-68600	PE-68600NL	1CT:3CT	.350 / .500 / .250	T608
TX1252	TX1252NL	1CT:1	.350 / .500 / .250	T608
T1229	T1229NL	1:1.583CT	.350 / .500 / .250	T659
1.5 kV Isolation, Extended Temperature Range, SMT				
TX1281	—	1CT:1	.220 / .305 / .200	T669
TX1282	—	1.14CT:1	.220 / .305 / .200	T669
TX1283	—	1.35CT:1	.220 / .305 / .200	T669
TX1284	—	1.26CT:1	.220 / .305 / .200	T669
TX1491	—	1CT:1	.220 / .305 / .200	T669
TX1492	—	2CT:1	.220 / .305 / .200	T669
TX1314	—	1:1/1.26	.300 / .390 / .250	T678
TX1315	—	1CT:1CT	.300 / .390 / .250	T678
TX1320	—	1CT:1.36CT	.300 / .390 / .250	T678
3.0 kV – Reinforced Insulation per IEC 950, THT				
PE-65830	PE-65830NL	1:1:1.58	.558 / .558 / .400	T608
PE-65831	PE-65831NL	1:1:2	.558 / .558 / .400	T608
PE-65832	PE-65832NL	1:1.36CT	.558 / .558 / .400	T608
PE-65833	PE-65833NL	1CT:2CT	.558 / .558 / .400	T608
PE-65834	PE-65834NL	1:1	.558 / .558 / .400	T608
PE-65835[1]	PE-65835NL	1CT:2CT	.558 / .558 / .400	T608
PE-65836	PE-65836NL	1CT:3CT:1	.558 / .558 / .400	T608
PE-65837	PE-65837NL	1:1.08:1.36	.558 / .558 / .400	T608
PE-65838	PE-65838NL	1:1.14	.558 / .558 / .400	T608
PE-65839	PE-65839NL	1:1:1.266	.558 / .558 / .400	T608
PE-68646	PE-68646NL	1:1.58:2	.558 / .558 / .400	T608
PE-68788	PE-68788NL	1CT:1.41CT	.558 / .558 / .400	T608
DUAL TRANSFORMERS				
1.5 kV Isolation, Extended Temperature Range, THT				
PE-68618	PE-686 18NL	1CT:1CT & 1CT:3CT:0.25	1.000 / .390 / .290	T608
PE-64950	PE-64950NL	1CT:1CT & 1CT:3CT:1	1.000 / .390 / .290	T608
PE-65567	PE-65567NL	1:1.15CT & 1:2CT	.800 / .390 / .290	T608
PE-65568	PE-65568NL	1:1:1.266 & 1:2CT	.800 / .390 / .290	T608
PE-65774	PE-65774NL	1CT:2CT & 1:1.36CT	.800 / .390 / .290	T608
1.5 kV Isolation, Standard Temperature Range, THT				
PE-64951	PE-64951NL	1:2CT & 1:2CT	.800 / .390 / .250	T608
PE-64952	PE-64952NL	1:2CT & 1:1.36CT	.800 / .390 / .250	T608
PE-64953	PE-64953NL	1:2CT & 1:2CT	.800 / .390 / .250	T608
PE-64954	PE-64954NL	1CT:2CT & 1:1	.800 / .390 / .250	T608
PE-64955	PE-64955NL	1.58:2CT & 1.58:1	.800 / .390 / .250	T608
PE-64956	PE-64956NL	2:2CT & 2:1	.800 / .390 / .250	T608
PE-64957	PE-64957NL	2.62:2CT & 2.62:1	.800 / .390 / .250	T608
PE-65565	PE-65565NL	1:1.15CT & 1:2CT	.800 / .390 / .290	T608
PE-65566	PE-65566NL	1:1:1.266 & 1:2CT	.800 / .390 / .290	T608
1.5 kV Isolation, Standard Temperature Range, BH Package, SMT				
T1136	T1136NL	1CT:1CT & 1CT:1.36CT	.505 / .375 / .245	T608
T1022	T1022NL	1CT:1CT & 1CT:1.5CT	.505 / .375 / .245	T608
T1190	T1190NL	1CT:1.36CT & 1CT:1CT	.505 / .375 / .245	T654
PE-65861	PE-65861NL	1CT:2CT & 1CT:2CT	.505 / .375 / .245	T608
PE-65862	PE-65862NL	1CT:2CT & 1:1.36CT	.505 / .375 / .245	T608
PE-65865	PE-65865NL	1:1.15CT & 1CT:2CT	.505 / .375 / .245	T608
PE-65866	PE-65866NL	1:1/1.26 & 1CT:2CT	.505 / .375 / .245	T608
PE-65870	PE-65870NL	1CT:1.15CT & 1CT:1.15CT	.505 / .375 / .245	T608
PE-68678	PE-68678NL	1CT:1CT & 1CT:2CT	.505 / .375 / .245	T608
PE-68786	PE-68786NL	1CT:1.41CT & 1CT:1.41CT	.505 / .375 / .245	T608
T1023	T1023NL	1CT:1.41CT & 1CT:1.41CT	.505 / .375 / .245	T608
T1137	T1137NL	1CT:2.42CT & 1CT: 2.42CT	.505 / .375 / .245	T651
T1021	T1021NL	2CT:1/1.26 & 2CT:1/1.26	.505 / .375 / .245	T637
T1075	T1075NL	2CS:1.57/2 & 2CS:1.57/2	.505 / .375 / .245	T637
T1122	T1122NL	1CT:2CT & 1CT:2.3CT	.505 / .375 / .245	T608
T1121	T1121NL	1CT:1.5CT & 1CT:1.5CT	.505 / .375 / .245	T608
T1286	T1286NL	1CT:2.4CT & 1CT: 2.4CT	.505 / .375 / .245	T608

1. ***To make a*** *1CT:1 ratio from a 1CT:2CT ratio, use only one-half the 2CT winding.*

***L/W/H** is measured on surface mount parts tip to tip (height includes wash area).

SMT - Surface Mount Package **THT -** Through Hole Package

TELECOMMUNICATIONS PRODUCTS

TRANSFORMERS, TRANSFORMER/CHOKE INTERFACE MODULES

T1/E1/CEPT/ISDN-Pri—SINGLE, DUAL, Quad

Part Number	RoHS-6 Part Number	Turns Ratio	Package L/W/H (in.)*	Data Sheet
DUAL TRANSFORMERS *(continued)*				
1.5 kV Isolation, Extended Temperature Range, BH Package, SMT				
T1090	T1090NL	1CT:2CT & 1CT:2CT	.505 / .375 / .245	T608
T1091	T1091NL	1CT:2CT & 1:1.36CT	.505 / .375 / .245	T608
T1076	T1076NL	1:1.15CT & 1CT:2CT	.505 / .375 / .245	T608
T1092	T1092NL	1:1/1.26 & 1CT:2CT	.505 / .375 / .245	T608
T1093	T1093NL	1CT:1.15CT & 1CT:1.15CT	.505 / .375 / .245	T608
T1077	T1077NL	1CT:1CT & 1CT:1.5CT	.505 / .375 / .245	T608
T1094	T1094NL	1CT:1CT & 1CT:2CT	.505 / .375 / .245	T608
T1144	T1144NL	1CT:1CT & 1CT:2.4CT	.505 / .375 / .245	T608
T1095	T1095NL	1CT:1.41CT & 1CT:1.41CT	.505 / .375 / .245	T608
T1096	T1096NL	1CT:1.41CT & 1CT:1.41CT	.505 / .375 / .245	T608
T1097	T1097NL	1CT:1CT & 1CT:1.67CT	.505 / .375 / .245	T608
T1146	T1146NL	1:2/2.4 & 1:0.79/1	.505 / .375 / .245	T608
TX1088	TX1088NL	1CT:2CT & 1CT:2.42CT	.505 / .375 / .245	T608
TX1089	TX1089NL	1CT:1CT & 1CT:1CT	.505 / .375 / .245	T608
TX1099	TX1099NL	1CT:1:0.8 & 1CT:1:0.8	.505 / .375 / .245	T608
TX1287	TX1287NL	1CT:2.42CT & 1CT: 2.42CT	.505 / .375 / .245	T608
TX1317	TX1317NL	1:2CT & 1:2CS	.505 / .375 / .245	T608
TX1186	TX1186NL	1CT:1.58:2 & 1:1.65:2	.505 / .375 / .245	T608
TX1187	TX1187NL	1CT:2CT & 1:1	.505 / .375 / .245	T608
TX1188	TX1188NL	1CT:2CT & 1CT:2CT	.505 / .375 / .245	T608
TX1189	TX1189NL	1:1.36CT & 1:2CT	.505 / .375 / .245	T608
TX1467	TX1467NL	1CT:1:1 & 1CT:1:1	.505 / .375 / .245	T608
1.5 kV Isolation, Standard Temperature Range, ANTE Package, SMT				
T1131	T1131NL	1CT:1 & 1:1.36CT	.675 / .600 / .340	T608
PE-68861	PE-68861NL	1CT:2CT & 1CT:2CT	.675 / .600 / .340	T608
PE-68862	PE-68862NL	1CT:2CT & 1:1.36CT	.675 / .600 / .340	T608
PE-68863	PE-68863NL	1:2CT & 1:1.14CT	.675 / .600 / .340	T608
PE-68864	PE-68864NL	1CT:2CT & 1:1	.675 / .600 / .340	T608
PE-68865	PE-68865NL	1:1.15CT & 1CT:2CT	.675 / .600 / .340	T608
PE-68866	PE-68866NL	1:1/1.26 & 1:2CT	.675 / .600 / .340	T608
PE-68869	PE-68869NL	1CT:2CT & 1:1.08CT	.675 / .600 / .340	T608
PE-68836	PE-68836NL	1:1/1.26 & 1:1/1.26	.675 / .600 / .340	T608
1.5 kV Isolation, Extended Temperature Range, ANTE Package, SMT				
PE-68822	PE-68822NL	1CT:2CT & 1:1.36CT	.675 / .600 / .340	T608
PE-68825	PE-68825NL	1:1.15CT & 1CT:2CT	.675 / .600 / .340	T608
PE-68826	PE-68826NL	1:1/1.26 & 1:2CT	.675 / .600 / .340	T608
PE-68827	PE-68827NL	1:1CT & 2:1	.675 / .600 / .340	T608
PE-68828	PE-68828NL	1CT:1CT & 1CT:1CT	.675 / .600 / .340	T608
PE-68841	PE-68841NL	1CT:2CT & 1CT:2CT	.675 / .600 / .340	T608
PE-68874	PE-68874NL	1CT:1.15CT & 1CT:1.15CT	.675 / .600 / .340	T608
PE-68877	PE-68877NL	1CT:1CT & 1CT:2CT	.675 / .600 / .340	T608
PE-68881	PE-68881NL	1CT:2.3CT & 1CT:2CT	.675 / .600 / .340	T608
PE-68882	PE-68882NL	1:1.15CT: & 1CT:1CT	.675 / .600 / .340	T608
PE-68884	PE-68884NL	1CT:1.36CT & 1CT:1.36CT	.675 / .600 / .340	T608
PE-68887	PE-68887NL	1CT:1.41CT & 1CT:1.41CT	.675 / .600 / .340	T608
TX1277	TX1277NL	1CT:1CT & 1CT:2CT	.675 / .600 / .340	T608
3.0 kV Isolation – Standard Temperature Range, SMT				
T1030	—	1CT:1CT & 1CT:1CT	.950 / .745 / .395	T617
T1081	—	1CT:1CT & 1CT:1.5CT	.950 / .745 / .395	T617
T1031	—	1CT:1CT & 1CT:2CT	.950 / .745 / .395	T617
T1032	—	1CT:1.15CT & 1CT:1CT	.950 / .745 / .395	T617
T1033	—	1CT:1.15CT & 1CT:1.15CT	.950 / .745 / .395	T617
T1034	—	1CT:1.15CT & 1CT:2CT	.950 / .745 / .395	T617
T1035	—	1CS:1CS & 1CS:1.36CS	.950 / .745 / .395	T617
T1038	—	1CT:1CT & 1CT:1.36CT	.950 / .745 / .395	T617
T1036	—	1CT:1.36CT & 1CT:1.36CT	.950 / .745 / .395	T617
T1037	—	1CT:1.41CT & 1CT:1.41CT	.950 / .745 / .395	T617
T1080	—	1CT:1.41CT & 1CT:1.41CT	.950 / .745 / .395	T617
T1039	—	1CT:2CT & 1CT:1.08CT	.950 / .745 / .395	T617
T1043	—	1CT:2CT & 1CT:1.14CT	.950 / .745 / .395	T617

Part Number	RoHS-6 Part Number	Turns Ratio	Package L/W/H (in.)*	Data Sheet
3.0 kV Isolation – Standard Temperature Range, SMT *(continued)*				
T1044	—	1CT:2CT & 1CT:1.36CT	.950 / .745 / .395	T617
T1045	—	1CT:2CT & 1CT:2CT	.950 / .745 / .395	T617
T1047	—	1CT:2.3CT & 1CT:2CT	.950 / .745 / .395	T617
T1049	—	1CT:1/1.26 & 1CT:2CT	.950 / .745 / .395	T617
T1082	—	1CT:2.42CT & 1CT:2.42CT	.950 / .745 / .395	T617
T1308	—	1CT:2.4CT & 1CT:1CT	.675 / .600 / .340	T666
DUAL TRANSFORMER/CHOKE INTERFACE MODULES				
1.5 kV Isolation, Extended Temperature Range, SMT				
T1207	T1207NL	1CT:2CT & 1CT:2CT	.675 / .600 / .340	T660
T1208	T1208NL	1CT:2CT & 1CT:1.36CT	.675 / .600 / .340	T660
T1209	T1209NL	1CT:1.15CT & 1CT:2CT	.675 / .600 / .340	T660
T1210	T1210NL	1CT:1.26CT & 1CT:2CT	.675 / .600 / .340	T660
T1211	T1211NL	1CT:1.15CT & 1CT:1.15CT	.675 / .600 / .340	T660
T1212	T1212NL	1CT:1CT & 1CT:2CT	.675 / .600 / .340	T660
T1213	T1213NL	1CT:1.15CT & 1CT:1CT	.675 / .600 / .340	T660
T1214	T1214NL	1CT:1.36CT & 1CT:1.36CT	.675 / .600 / .340	T660
T1215	T1215NL	1CT:1.41CT & 1CT:1.41CT	.675 / .600 / .340	T660
T1216	T1216NL	1CT:2.3CT & 1CT:2CT	.675 / .600 / .340	T660
T1217	T1217NL	1CT:2.42CT & 1CT:2.42CT	.675 / .600 / .340	T660
T1218	T1218NL	1CT:1CT & 1CT:1.36CT	.675 / .600 / .340	T660
T1219	T1219NL	1CT:2.4CT & 1CT:1CT	.675 / .600 / .340	T660
T1220	T1220NL	1CT:1CT & 1CT:1CT	.675 / .600 / .340	T660
QUAD TRANSFORMER/CHOKE INTERFACE MODULES				
1.5 kV Isolation, Extended Temperature Range, SMT				
T1176	T1176NL	1CT:2.4CT & 1CT:1CT	.690 / .630 / .225	T662
TX1192	TX1192NL	1CT:2.42CT & 1CT:2.42CT	.690 / .630 / .225	T662
TX1193	TX1193NL	1CT:2CT & 1CT:1CT	.690 / .630 / .225	T662
TX1194	TX1194NL	1CT:1.15CT & 1CT:1.15CT	.690 / .630 / .225	T662
TX1195	TX1195NL	1CT:1.41CT & 1CT:1.41CT	.690 / .630 / .225	T662
TX1196	TX1196NL	1CT:2CT & 1CT:2CT	.690 / .630 / .225	T662
TX1197	TX1197NL	1CT:2CT & 1CT:2CT	.690 / .630 / .225	T662
TX1198	TX1198NL	1CT:2.3CT & 1CT:1CT	.690 / .630 / .225	T662
TX1199	TX1199NL	1CT:1.36CT & 1CT:2CT	.690 / .630 / .225	T662
TX1300	TX1300NL	1CT:1.36CT & 1CT:1CT	.690 / .630 / .225	T662
TX1301	TX1301NL	1CT:1.15CT & 1CT:2CT	.690 / .630 / .225	T662
T1337	—	1CT:1CT & 1CT:1CT	.537 / .590 / .245	T665
QUAD TRANSFORMERS (four transformers per package)				
1.5 kV Isolation, Extended Temperature Range, SMT				
TX1321	TX1321NL	1CT:2.4CT & 1CT:1CT	.690 / .630 / .225	T662
TX1322	TX1322NL	1CT:2.42CT & 1CT:2.42CT	.690 / .630 / .225	T662
TX1323	TX1323NL	1CT:2CT & 1CT:1CT	.690 / .630 / .225	T662
TX1324	TX1324NL	1CT:1.15CT & 1CT:1.15CT	.690 / .630 / .225	T662
TX1325	TX1325NL	1CT:1.41CT & 1CT:1.41CT	.690 / .630 / .225	T662
TX1326	TX1326NL	1CT:2CT & 1CT:2CT	.690 / .630 / .225	T662
TX1327	TX1327NL	1CT:2CT & 1CT:2CT	.690 / .630 / .225	T662
TX1328	TX1328NL	1CT:2.3CT & 1CT:1CT	.690 / .630 / .225	T662
TX1329	TX1329NL	1CT:1.36CT & 1CT:2CT	.690 / .630 / .225	T662
TX1330	TX1330NL	1CT:1.36CT & 1CT:1CT	.690 / .630 / .225	T662
TX1331	TX1331NL	1CT:1.15CT & 1CT:2CT	.690 / .630 / .225	T662
QUAD TRANSFORMERS (four transformers per package)				
1.5 kV Isolation, Standard Temperature Range, SMT				
T1001	T1001NL	1:1 & 1:1.36	1.000 / .425 / .295	T615
T1005	T1005NL	1:1.267 & 1:1.58	1.000 / .425 / .295	T615
T1006	T1006NL	1:1 & 1:2CT	1.000 / .425 / .295	T615
T1007	T1007NL	1:1.15	1.000 / .425 / .295	T615
T1008	T1008NL	1:1.364 & 1:2	1.000 / .425 / .295	T615
T1009	T1009NL	1:1 & 1:1.265	1.000 / .425 / .295	T615
T1010	T1010NL	1:1.36CT	1.000 / .425 / .295	T615
T1016	T1016NL	1:1.15 & 1:2	1.000 / .425 / .295	T615
T1017	T1017NL	1:2.3 & 1:2	1.000 / .425 / .295	T615

***L/W/H** is measured on surface mount parts tip to tip (height includes wash area).

SMT - Surface Mount Package **THT** - Through Hole Package

TELECOMMUNICATIONS PRODUCTS

TRANSFORMERS, TRANSFORMER MODULES

T1/E1/CEPT/ISDN-Pri—Octal

Part Number	RoHS-6 Part Number	Turns Ratio TX	Turns Ratio RX	Package L/W/H (in.)*	Data Sheet
OCTAL TRANSFORMERS (eight transformers per package)					
1.5 kV Isolation, Standard Temperature Range, SMT					
T1063	T1063NL	1:1.36	1:1.36CT	1.125 / .640 / .230	T622
T1064	T1064NL	1:1.14	1:1.14CT	1.125 / .640 / .230	T622
T1065	T1065NL	1:2CT	1:2CT	1.125 / .640 / .230	T622
T1066	T1066NL	1:2	1:2CT	1.125 / .640 / .230	T622
T1067	T1067NL	1:1.36CT	1:2CT	1.125 / .640 / .230	T622
T1068	T1068NL	1:2CT	1:1CT	1.125 / .640 / .230	T622
T1069	T1069NL	1CT:1.41	1CT:1.41	1.125 / .640 / .230	T622
T1070	T1070NL	1:1.15	1:2CT	1.125 / .640 / .230	T622
T1071	T1071NL	1:1/1.26	1:2CT	1.125 / .640 / .230	T622
T1072	T1072NL	1:1.15	1:1.15	1.125 / .640 / .230	T622
T1073	T1073NL	1:2	1:2	1.125 / .640 / .230	T622
T1124	T1124NL	1:2CT	1CT:2	1.125 / .640 / .230	T622
T1125	T1125NL	1:1.70	1:1.36CT	1.125 / .640 / .230	T622
T1129	T1129NL	1:1.36CT	1:1CT	1.125 / .640 / .230	T622
T1142	T1142NL	1:2.4	1:1	1.125 / .640 / .230	T622
T1145	T1145NL	1:2/2.4	1:0.79/1	1.125 / .640 / .230	T622
T1180	T1180NL	1:2.42	1:2.42	1.125 / .640 / .230	T622
T1181	T1181NL	1:2.1CT	1:2.1CT	1.125 / .640 / .230	T622
T1182	T1182NL	1:2.45CT	1:2.45CT	1.125 / .640 / .230	T622
T1078	T1078NL	1:1.08	1.08CT:1	1.125 / .640 / .230	T622
1.5 kV Isolation, Extended Temperature Range, SMT					
T1103	T1103NL	1:1.36	1:1.36CT	1.125 / .640 / .230	T622
T1104	T1104NL	1:1.14	1:1.14CT	1.125 / .640 / .230	T622
T1105	T1105NL	1:2CT	1:2CT	1.125 / .640 / .230	T622
T1106	T1106NL	1:2	1:2CT	1.125 / .640 / .230	T622
T1107	T1107NL	1:1.36CT	1:2CT	1.125 / .640 / .230	T622
T1108	T1108NL	1:2CT	1:1CT	1.125 / .640 / .230	T622
T1109	T1109NL	1CT:1.41	1CT:1.41	1.125 / .640 / .230	T622
T1110	T1110NL	1:1.15	1:2CT	1.125 / .640 / .230	T622
T1111	T1111NL	1:1/1.26	1:2CT	1.125 / .640 / .230	T622
1.5 kV Isolation, Standard Temperature Range, SMT					
T1112	T1112NL	1:1.15	1:1.15	1.125 / .640 / .230	T622
T1113	T1113NL	1:2	1:2	1.125 / .640 / .230	T622
T1114	T1114NL	1:2CT	1CT:2	1.125 / .640 / .230	T622
T1226	T1226NL	1:1.5	1.41:1	1.125 / .640 / .230	T622
T1231	T1231NL	1:2.4	1:1	1.125 / .640 / .230	T622
TX1262	TX1262NL	1:2	1:2	1.125 / .640 / .230	T622
TX1264	TX1264NL	1:2CT	1CT:1.41	1.125 / .640 / .230	T622
TX1266	TX1266NL	1:2	1:1	1.125 / .640 / .230	T622
TX1292	TX1292NL	1:1.36	1:1	1.125 / .640 / .230	T622
TX1294	TX1294NL	1:1CT	1:1CT	1.125 / .640 / .230	T622
TX1295	TX1295NL	1:1.26CT	1:1.26CT	1.125 / .640 / .230	T622
TX1298	TX1298NL	1:1	1:1	1.125 / .640 / .230	T622
TX1299	TX1299NL	1:2.42	1:2.42	1.125 / .640 / .230	T622
TX1341	TX1341NL	1:2	1:2	1.000 / .425 / .295	T671
TX1342	TX1342NL	1:1.15	1:1.15	1.000 / .425 / .295	T671
T1343	T1343NL	1:1.266	1:1.266	1.000 / .425 / .295	T671
TX1344	TX1344NL	1:1	1:2	1.000 / .425 / .295	T671
TX1470	TX1470NL	1:1.41	1:1.41	1.000 / .425 / .295	T671
TX1472	TX1472NL	1: 2.4	1:1	1.000 / .425 / .295	T671
TX1473	TX1473NL	1:2	1:1	1.000 / .425 / .295	T671
TX1474	TX1474NL	1:2.42	1:2.42	1.000 / .425 / .295	T671
TX1471	TX1471NL	1:1	1:1	1.000 / .425 / .295	T671
OCTAL TRANSFORMER/CHOKE INTERFACE MODULES					
1.5 kV Isolation, Extended Temperature Range, SMT					
TX1263	TX1263NL	1:2	1:2	1.125 / .640 / .285	T682
TX1267	TX1267NL	1:2	1:1	1.125 / .640 / .285	T682

SONET/SDH (STM-1/E4/CMI)

Part Number	Turns Ratio	Primary Inductance OCL (µH MIN)	Package L/W/H (in.)[1]	Data Sheet
DUAL, SMT				
A7802	1:1	42	.500 / .295 / .220	A103
ST6200QNL	1CT:1CT	28	.455 / .375 / .225	T692

*1. **SOIC** = 50 mil pitch leads. Length and width are MAX package dimensions. Height dimensions include the wash area.*

T1/E1 Protection Modules

Part Number	Turns Ratio TX	Turns Ratio RX	Primary Inductance OCL (µH MIN)	Package L/W/H (in.)*	Data Sheet
OCTAL TRANSFORMER MODULES, 1.5 kV Isolation					
Extended Temperature Range, Line Side Protection, SMT					
T9030	1CT:2	1CT:1	1.2	1.255 / .852 / .305	T656
TX9031	1CT:2.4	1:1CT	1.2	1.255 / .852 / .305	T670
TX9032	1CT:1	1:1CT	1.2	1.255 / .852 / .305	T680
TX9033	1CT:1.14	1.14:1CT	1.2	1.255 / .852 / .305	T680
IC Side Protection, SMT					
T9021	1:2.42	1:2.42	.6	1.125 / .640 / .285	T657
TX9020	1:2.42	1:2.42	1.2	1.125 / .640 / .285	T677
TX9022	1:2.42	1:2.42	1.2	1.125 / .640 / .285	T677
TX9023	1:2	1:2	1.2	1.125 / .640 / .285	T674
TX9025	1:2CT	1:2	1.2	1.125 / .640 / .285	T686
TX9027	1:2	1:2	1.2	1.125 / .640 / .285	T691

T3/DS3/E3/STS-1—Single, Dual, Six Octal, Twelve

Part Number	Turns Ratio	Primary Inductance OCL (µH MIN)	Package L/W/H (in.)*	Data Sheet
SINGLE TRANSFORMERS				
THT				
PE-68629	1:1	40	.350 / .500 / .250	T606
PE-65966	1:1	40	.300 / .280 / .250	T606
PE-65663	1:1	40	.300 / .400 / .250	T606
PE-65969	1:2CT	19	.300 / .280 / .250	T606
PE-65664	1:2CT	35	.300 / .400 / .250	T606
PE-68630	1:2CT	19	.350 / .500 / .250	T606
PE-65779	1:4CT	200	.300 / .400 / .250	T606
PE-65856	1:1.73CT	50	.300 / .280 / .250	T606
SMT				
PE-65967	1:1	40	.300 / .390 / .250	T606
PE-65662	1:1	45	.300 / .420 / .200	T606
PE-65968	1:2CT	19	.300 / .390 / .250	T606
PE-65661	1:2CT	35	.300 / .420 / .200	T606
SMT, Extended Temperature Range				
T3001	1:1	100	.300 / .390 / .250	T619
T3002	1:2CT	40	.300 / .390 / .250	T619
T3011	1:1	100	.300 / .390 / .250	T619
T3012	1:2CT	40	.300 / .390 / .250	T619
T3027	1CT:1CT	40	.300 / .390 / .250	T619
T3029	1:1.15CT	40	.300 / .390 / .250	T619
DUAL TRANSFORMERS, SMT, Extended Temperature Range				
T3020	1:2CT & 1:1	40 & 100	.505 / .375 / .245	T655
T3021	1:2CT & 1:2CT	100 & 100	.505 / .375 / .245	T655
T3023	1:1 & 1:1	40 & 40	.505 / .375 / .245	T655
TX3025	1CT:1CT & 1:1	100 & 100	.505 / .375 / .245	T655
TX3026	1:2CT & 1:1	100 & 100	.505 / .375 / .245	T655
SIX TRANSFORMERS (Triple Port) SMT, Extended Temperature Range				
TX3036	1:1	100	.537 / .510 / .226	T672
OCTAL TRANSFORMERS (Quad Port) SMT				
TX3042	1:1 & 1:2CT	40	1.125 / .640 / .230	T690
TX3045	1:1 & 1:2	40	1.000 / .425 / .295	T663
TX3047	1:1	40	1.000 / .425 / .295	T663
T3048	1:1	40	1.000 / .425 / .295	T663
T3049	1:2	19	1.000 / .425 / .295	T663
TWELVE TRANSFORMERS (Six Port) SMT, Extended Temperature Range				
TX3051	1:1	60	1.120 / .630 / .280	T668
TX3052	1:2	40	1.120 / .630 / .280	T668

SMT - Surface Mount Package **THT -** Through Hole Package

***L/W/H** is measured on surface mount parts tip to tip (height includes wash area).

TELECOMMUNICATIONS PRODUCTS

TRANSFORMERS, TRANSFORMER MODULES

ISDN U-Interface [1]

Part Number 1.5-2.0 kV	Part Number 2.5 kV	Part Number 3 kV	Turns Ratio	OCL Line Side (mH MIN)	Package L/W/H (in.)*	Data Sheet
THT						
PE-65575	—	PE-68669	1.65:1	13.0 -18.0	1.100/ .750 / .430	T603
PE-65578	—	—	1.32:1	7.0 - 8.3	1.100/ .750 / .430	T603
PE-65579	—	—	2.00:1	25.5 - 28.5	1.100/ .950 / .450	T603
PE-65581	—	—	1.50:1	14.2-15.8	1.100/ .950 / .450	T603
PE-65583	PE-68631	—	1.50:1	25.6-28.4	1.100/ .950 / .450	T603
PE-65584	PE-68681	—	1.50:1	25.6-28.4	1.100/ .950 / .450	T603
PE-68628	PE-68668	—	1.25:1	26.5-29.5	1.100/ .950 / .450	T603
T4008	—	—	1.50:1	73.0-98.0	1.050/ .900/1.050	T616
PT4084	—	—	1:0.75:0.75	85.0	.800 /1.020/ .675	PT4084
PT5031	—	—	1:1.25	14.5	.800 /1.020/ .675	PT5031
PT5062	—	—	1:1.6CT	27.0	.800 /1.020/ .675	PT5062
PT5065	—	—	1:1.33CT	27.0	.800 /1.020/ .675	PT5065
T4022	—	—	1.6CS:1CT	8.41-2.60	.760 / .870 / .450	T625

*1. **Echo** Cancellation Hybrid units **PE-36005** and **PE-36005W** are also available.*

Part Number	Turns Ratio	Primary Inductance OCL (mH MIN)	Package L/W/H (in.)*	Data Sheet
SMT				
T4001	1.25:1	26.5 - 30.0	.760 / .870 / .500	T614
T4002	1.65:1	15.0 - 18.0	.760 / .870 / .500	T614
T4004	1.50:1	25.6 - 28.4	.760 / .870 / .500	T614
T4006	1.50:1	14.2 - 15.8	.760 / .870 / .500	T614
T4031	1.65CS:1CT	13.0 - 18.0	.695 / .530 / .485	T624
T4032	1.25CS:1CT	11.9 - 16.1	.695 / .530 / .485	T624
T4033	1.25CS:1CT	26.6 - 29.4	.695 / .530 / .485	T624
T4043	2CS:1CS	13.5 -16.5	.695 / .530 / .485	T624
T4067	1.32CS:1	7.5 - 8.3	.695 / .530 / .485	T624

*1. **Echo** Cancellation Hybrid units **PE-36005** and **PE-36005W** are also available.*

ISDN S-Interface — Single, Dual

Part Number	Turns Ratio	Primary Inductance OCL (mH MIN)	Package L/W/H (in.)*	Data Sheet
SINGLE TRANSFORMERS, 1.5 kV ISOLATION				
PCMCIA Type 2, SMT				
T5002	1:1	22	.492 / .670 / .167	T631
T5003	1:2	22	.492 / .670 / .167	T631
T5004	1:2.5	22	.492 / .670 / .167	T631
SINGLE TRANSFORMERS, 2.0 kV ISOLATION				
THT				
PE-64993	1:1	22	.560 / .560 / .400	T604
PE-64994	1:1.8	22	.560 / .560 / .400	T604
PE-64995	1:2	22	.560 / .560 / .400	T604
PE-64996	1:2.5	22	.560 / .560 / .400	T604
PE-64998	1:2.5	22	.560 / .560 / .400	T604
PE-64999	1:2	22	.560 / .560 / .400	T604
DUAL TRANSFORMERS, 2.0 kV ISOLATION				
THT				
PE-65492	1:1 & 1:2	22	.920 / .560 / .400	T604
PE-65493	1:1 & 1:1	22	.920 / .560 / .400	T604
PE-65495	1:2 & 1:2	22	.920 / .560 / .400	T604
PE-65498	1:2.5 & 1:2.5	22	.920 / .560 / .400	T604
PE-65499	1:2 & 1:2	22	.920 / .560 / .400	T604
SMT				
PE-65792	1:1 & 1:2	22	.950 / .720 / .390	T604
PE-65793	1:1 & 1:1	22	.950 / .720 / .390	T604
PE-65795	1:2 & 1:2	22	.950 / .720 / .390	T604
PE-65798	1:2.5 & 1:2.5	22	.950 / .720 / .390	T604
PE-65799	1:2 & 1:2	22	.950 / .720 / .390	T604
ST5048	1CS:2.5CS & 1CS:2.5CS	22	.987 / .575 / .340	ST5048
ST5069	1CS:2CS & 1CS:2CS	22	.987 / .575 / .340	ST5069

ISDN S-Interface — Single, Dual *(continued)*

Part Number	Turns Ratio	Primary Inductance OCL (mH MIN)	Package L/W/H (in.)*	Data Sheet
DUAL TRANSFORMERS, 2.0 kV ISOLATION *(continued)*				
Low Profile, SMT				
T5005	1:2.5 & 1:2.5	22	.950 / .720 / .295	T613
T5006	1:2 & 1:2	22	.950 / .720 / .295	T613
T5007	1:2 & 1:2	22	.950 / .720 / .295	T613
T5008	1:1 & 1:1	22	.950 / .720 / .295	T613
T5009	1:1 & 1:2	22	.950 / .720 / .295	T613
T5010	1:1.8 & 1:1.8	22	.950 / .720 / .295	T613
SINGLE TRANFORMERS, 3.0 kV ISOLATION				
Reinforced Insulation per IEC 950, THT				
PE-68992	1:2CT	22	.750 / .750 / .500	T604
PE-68993	1:1	22	.750 / .750 / .500	T604
PE-68995	1:2	22	.750 / .750 / .500	T604
PE-68998	1:2.5	22	.750 / .750 / .500	T604
PE-68999	1:2	22	.750 / .750 / .500	T604
T5035	1CT:2CT	30	.578 / .648 / .565	T636
DUAL TRANSFORMERS, 3.0 kV ISOLATION				
SMT				
T5042	1:2 & 1:2	22	1.092 / .726 / .430	T638
T5043	1:2.5 & 1:2.5	22	1.092 / .726 / .430	T638

ISDN S-Interface Modules, Transformer & Choke

Part Number	Turns Ratio	Pri. Inductance OCL (mH MIN) Transformer	OCL (mH MIN) Choke	Package L/W/H (in.)*	Data Sheet
THT					
T5011	1CT:1CT & 1CT:1CT	30	4.70	1.150 / .420 / .590	T632
T5012	1CT:2CT & 1CT:2CT	30	4.70	1.150 / .420 / .590	T632
T5013	1CT:2.5CT & 1CT:2.5CT	30	4.70	1.150 / .420 / .590	T632
T5015	1:2CT & 1:2CT	30	4.70	1.150 / .420 / .590	T632
SMT					
T5034	1CT:2CT & 1CT:2CT	30	4.70	1.170 / .660 / .320	T635
T5037	1CT:2.5CT & 1CT:2.5CT	30	4.70	1.170 / .660 / .320	T635
T5038	1CT:2CT & 1CT:2CT	30	0.47	1.170 / .660 / .320	T635
T5039	1CT:2.5CT & 1CT:2.5CT	30	0.47	1.170 / .660 / .320	T635
ST5201	1CS:2CS & 1CS:2CS	22	0.42	.987 / .575 / .340	ST5201
T5049	1CT:1CT & 1CT:1CT	30	4.70	1.170 / .660 / .320	T635

Echelon® & Digital Audio, Single

Part Number	Turns Ratio	Primary Inductance OCL (mH MIN)	Package L/W/H (in.)*	Data Sheet
THT				
T6074 [1]	1:1	.225	.350 / .500 / .250	T688
T6075	1:1	.225	.350 / .500 / .250	T688
PE-65948	1CT:1CT	3.5 - 6.5	.350 / .500 / .250	T602
PE-65612	1:1	2.5	.350 / .500 / .250	T601
SMT				
PE-65848	1CS:1CS	3.5 - 6.5	.480 / .600 / .340	T602
PE-65812	1:1	2.5	.480 / .600 / .340	T601

*1. **With** shield*

DDS / Switched 56

Part Number	Turns Ratio	Primary Inductance OCL (mH MIN)	Package L/W/H (in.)*	Data Sheet
SMT				
T7002	1CT:1CT	40	.530 / .695 / .485	T629
T7006	1CT:1CT	40	.410 / .525 / .365	T629

Audio / Voice Band

Part Number	Turns Ratio	Isolation Voltage	Package L/W/H (in.)*	Data Sheet
SMT				
T6003	1:1	1500	.530 / .695 / .485	T628

SMT - Surface Mount Package **THT -** Through Hole Package

***L/W/H** is measured on surface mount parts tip to tip (height includes wash area).

TELECOM IC CROSS REFERENCE

IC CROSS REFERENCE

ISDN U-Interface

IC Manufacturer/ IC Part Number	Recommended Transformer 1.5 kV THT	1.5 kV SMT	2 kV THT	2 kV SMT	2.5 kV	3 kV
Alcatel (Microelectronics)						
MTC20276	—	T4043	—	—	—	—
AKM						
AK5204	T4022	—	—	—	—	—
Infineon Technologies (Siemens)						
PEB 2091	PT5031	T4031	PE-65575	T4002	—	PE-68669
PEB 8091/8191	—	T4031	PE-65575	T4002	—	PE-68669
PEB 2090/20901	—	T4067	PE-65578	—	—	—
PEB 24902/11	—	T4031	PE-65575	T4002	—	PE-68669
PSB 21910/11	—	T4031	PE-65575	T4002	—	PE-68669
PEB 2491	—	T4032	—	—	—	—
PEB 20901	—	T4067	PE-65578	—	—	—
PEB 2095	—	—	—	—	—	—
PSB 2196	—	—	—	—	—	—
Lucent Technologies						
T7234	PT4084	—	T4008	—	—	—
Motorola						
MC145472	—	—	PE-65579	—	—	—
MC145572	PT5062	T4033	PE-68628[1]	T4001[2]	PE-68668	—
National Semiconductor						
TP3410	PT5065	—	PE-65583	—	PE-68631	—
	—	—	PE-65584	T4004	—	—
Thomson						
SD 5411	—	—	PE-65581	T4006	PE-68631	—

1. ***Small package*** *for North American applications available. See* ***T618*** *data sheet.*
2. ***Suitable*** *for use in North America only.*

Echelon® & Digital Audio

IC Manufacturer	IC Part Number	Single SMT	Single THT
Echelon ®	3120™ 1.25 Mbps	PE-65848	PE-65948
	3150™ 1.25 Mbps	PE-65848	PE-65948
AKM	AK4101	PE-65812	PE-65612
	AK4102	PE-65812	PE-65612
	AK4103	PE-65812	PE-65612
Cirrus Logic	CS8401/2/3/4	PE-65812	PE-65612
	CS8405/8415	PE-65812	PE-65612
	CS8413/14/27	PE-65812	PE-65612
	CS8406/8416	—	T6074/T6075
Realtek	ALS300+	PE-65812	PE-65612

DDS/Switched 56

IC Manufacturer	IC Part Number	Recommended Transformer Dual SMT
Intel	LXT 441	T7002
Intel	LXT 441	T7006

SONET/SDH (STM-1/E4/CMI) DUAL TRANSFORMERS

IC Manufacturer	IC Part Number	Recommended Transformer Single SMT
AMCC	S3015, S3016, S3031B	A7802
Intel	LXT6155	ST6200QNL

ISDN S-Interface

IC Manufacturer/ Part Number	Dual SMT TX & RX	Single THT TX & RX	Dual THT TX & RX	Dual SMT Module 1.5kVRMS TX & RX	THT Module w/ Choke 1.5kVRMS TX & RX	Single THT 3kVRMS TX & RX	Dual SMT 3kVRMS TX & RX	PCMCIA TX & RX
Alcatel (Microelectronics)								
MTC2072, MTC20172	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
MTC20276/77	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
AMD								
AM79C30/32	PE-65799/T5006 LP	PE-64999	PE-65499	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
Cologne Chip Design								
HFC-SXX	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68999/T5035	T5042	T5003
Infineon Technologies (Siemens)								
PEB2080/81/84/85/86	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
PSB2115/86	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
PSB21381/82/83/84	PE-65793/T5008 LP/ST5048	PE-64993	PE-65493	T5049	T5011	PE-68993	—	T5002
PEB3018/86,PSB3186	PE-65793/T5008 LP/ST5048	PE-64993	PE-65493	T5049	T5011	PE-68993	—	T5002
PEB8090/91, PEB8190/91	—	—	—	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	—
Intel								
29C53	PE-65795/T5010 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
Lucent Technologies								
T7234, T7254	PE-65798/T5005 LP	PE-64998	PE-65498	T5037/T5039	T5013	PE-68998	T5043	T5004
T7250/56/59	PE-65798/T5005 LP	PE-64998	PE-65498	T5037/T5039	T5013	PE-68998	T5043	T5004
T7901/03	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
Mitel								
MT8930/31	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
Motorola								
MC145474/475	PE-65793/T5008 LP/ST5048	PE-64993	PE-65493	T5049	T5011	PE-68993	—	T5002
MC145574	PE-65798/T5005 LP	PE-64998	PE-65498	T5037/T5039	T5013	PE-68998	T5043	T5004
National Semiconductor								
TP3420/21	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
SGS Thomson								
ST5420/21	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003
Yamaha								
7405B, YTD421	PE-65795/T5007 LP/ST5069	PE-64995	PE-65495	T5034/T5038/ST5201	T5015/T5012	PE-68995/T5035	T5042	T5003

NOTE: LP = *Low Profile*

***L/W/H** is measured on surface mount parts tip to tip (height includes wash area).

SMT - Surface Mount Package **THT -** Through Hole Package

TELECOM IC CROSS REFERENCE

IC CROSS REFERENCE

T3/DS3/E3/STS-1

IC Manufacturer/ IC Part Number	12 Xfmrs Ext. Temp.	Octal Xfmrs	6 Xfmrs Ext. Temp.	Dual SMT Ext. Temp.	Single SMT				Single THT		Single THT 3 kVRMS	
					Standard Temp.		Extended Temp.					
	TX & RX	TX & RX	TX & RX	TX & RX	TX	RX	TX	RX	TX	RX	TX	RX
Exar												
XRT75xxx	TX3051	T3048	TX3036	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
XRT73L00/2/3/4/6/12	TX3051	T3048	TX3036	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
XRT73LC03A/04A,R12	TX3051	T3048	TX3036	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
XRT7300/7302	TX3051	T3048	TX3036	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
Infineon Technologies												
PEB3452/3460	—	—	—	—	—	—	T3027	T3011/01	—	—	—	—
Maxim (Dallas Semi)												
DS3181/2/3/4	TX3052	T3049	—	—	PE-65968	PE-65968	T3002	T3002	PE-65969	PE-65969	PE-68630	PE-68630
DS3150/1/2/3/4	TX3052	T3049	—	—	PE-65968	PE-65968	T3002	T3002	PE-65969	PE-65969	PE-68630	PE-68630
Mindspeed												
CN28333/332/331	TX3051	T3048	TX3036	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
M28335/M28356	TX3051	T3048	TX3036	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
M28354/3/2	TX3051	T3048	TX3036	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
TDK Semiconductor												
78P2342/43/44	TX3051/TX3052	TX3045	T3020 or TX3026	PE-65968	PE-65967	T3002	T3001	PE-65969	PE-65966	PE-68630	PE-68629	—
78P2241B	TX3051/TX3052	TX3045	T3020 or TX3026	PE-65968	PE-65967	T3002	T3001	PE-65969	PE-65966	PE-68630	PE-68629	—
78P7200/7200L	TX3051/TX3052	TX3045	T3020 or TX3026	PE-65968	PE-65967	T3002	T3001	PE-65969	PE-65966	PE-68630	PE-68629	—
78P7203L/7204L	TX3051/TX3052	TX3045	T3020 or TX3026	PE-65968	PE-65967	T3002	T3001	PE-65969	PE-65966	PE-68630	PE-68629	—
78P2362/2361	TX3051/TX3052	TX3045	T3020 or TX3026	PE-65968	PE-65967	T3002	T3001	PE-65969	PE-65966	PE-68630	PE-68629	—
Transwitch												
MRT TXC-02050	TX3051/TX3052	TX3045	—	T3020 or TX3026	PE-65968	PE-65967	T3002	T3001	PE-65969	PE-65966	PE-68630	PE-68629
ART TXC-02020	TX3051	T3048	—	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
ARTE TXC-02021	TX3051	T3048	—	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
DART TXC-2030, DS3	TX3051	T3048	—	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
DART TXC-2030, E3	TX3051/TX3052	T3049/T3048	—	T3020 or TX3026	PE-65968	PE-65967	T3002	T3001	PE-65969	PE-65966	PE-68630	PE-68629
DS3LIM-SN, TXC20153G	TX3051	T3048	—	TX3025	PE-65967	PE-65967	T3001	T3001	PE-65966	PE-65966	PE-68629	PE-68629
E3LIM TXC-20163	TX3051/TX3052	T3049/T3048	—	T3020 or TX3026	PE-65968	PE-65967	T3002	T3001	PE-65969	PE-65966	PE-68630	PE-68629

***L/W/H** is measured on surface mount parts tip to tip (height includes wash area).

SMT - Surface Mount Package **THT -** Through Hole Package

TELECOM IC CROSS REFERENCE

Pulse® A TECHNITROL COMPANY

IC CROSS REFERENCE: T1/E1/CEPT/ISDN-Pri FOR SINGLE & MULTIPORT PORT ICs

IC MFR.	IC PART NO. / COMMENT		DUAL SMT (BH)		DUAL SMT (AN)		DUAL SMT XFMR/CHOKE	SINGLE THT	
			STD TEMP	EXT TEMP	STD TEMP	EXT TEMP	EXT TEMP	STANDARD TEMP	
			TX & RX	TX & RX	TX & RX	TX & RX	TX & RX	TX	RX
Cirrus Logic (Crystal)	61577	T1 & E1	PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	61304A/5A/535A/574A,/75	T1	PE-65865	T1076	PE-68865	PE-68825	T1209	PE-65388	PE-65351
	61304A/5A/535A/574A,/75	75 E1	PE-65866	T1092	PE-65866	PE-68826	T1212	PE-65389	PE-65351
	61304A/5A/535A/574A,/75	120 E1	PE-65866	T1092	PE-65866	PE-68826	T1210	PE-65389	PE-65351
	61884	T1/E1/J1	PE-65861	TX1188	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	61582, 61583		PE-65870	T1093	PE-68874	PE-68874	T1211	PE-65388	PE-65388
	61310, 61581		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65351	PE-64936
	61310, 61581	Host	T1022	T1077	T1022	—	—	PE-65351	PE-65351
	61880, 61881		PE-65865	T1076	PE-68865	PE-68825	T1209	PE-65388	PE-65351
	61584/84A	IQ3	PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	61584/82/83/A	IQ5	PE-65870	T1093	PE-68874	PE-68874	T1211	PE-65388	PE-65388
Exar	XRT5683A, XRT59L91		PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65415	PE-65415
	XRT5894/5897/5997		PE-65861	T1090	PE-65861	PE-68841	T1207	PE-65415	PE-65415
	XRTT5793/94		PE-65866	T1092	PE-68866	PE-68826	T1220	PE-65389	PE-64934
	XRT81L27,82L24,82D20		PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65415	PE-65415
	XRT83L30/4/8/314,86L38		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65415	PE-64934
	XRT83SL30/4/8/314		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65415	PE-64934
	XRT86L30/32/34/38		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65415	PE-64934
	T5684,XRT7288,82D20		PE-65862	T1091	PE-68862	PE-68822	T1208	PE-64937	PE-65351
IDT	82V2048, 82V2058		TX1188	TX1188	PE-68861	PE-68841	T1207	PE-65415	PE-65415
	82V2044/48/48L/54/58		TX1188	TX1188	PE-68861	PE-68841	T1207	PE-65415	PE-65415
	82V2041E/2E/4E/8E		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65415	PE-64934
	82V2081/2/4/8		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65415	PE-64934
	82P2281/2/4/8		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65415	PE-64934
Infineon Technologies (Siemens)	PEB 2254/55	E1/T1 & J1	PE-68786	T1095	PE-68887	PE-68887	T1215	—	—
	PEB 2254/55	E1/T1 & J1	T1023	T1096	PE-68887	PE-68887	T1215	—	—
	PEB 22504, 22554, 2256	3.3V	T1144	T1144	—	—	T1219	—	—
	PEB22554	75 E1	T1146	T1146	—	—	—	—	—
Intel	LXT 300/301		PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	LXT 304/305/307	T1,E1	PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	LXT 304/305/307	T1	PE-65865	T1076	PE-68865	PE-68825	T1209	PE-65388	PE-65351
	LXT 304/305/307	75E1,120E1	PE-65866	T1092	PE-68866	PE-68826	T1212	PE-65389	PE-65351
	LXT 304/305/307	DSX-1, D4	T1122		PE-68881	PE-68881	T1216	PE-65558	PE-65351
	LXT 310/317/318		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65351	PE-64936
	LXT 312/ 313/ 315		—	—	—	—	—	PE-64933	PE-64936
	LXT 331	T1,E1	PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65351	PE-64936
	LXT 331, LXT 332		PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	LXT 331, LXT 332		T1122	—	—	PE-68881	T1216	PE-65558	PE-65351
	LXT 331, LXT 332		PE-65865	T1076	PE-68865	PE-68825	T1209	PE-65388	PE-65351
	LXT 334, LXT 335	T1/E1	PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	LXT 334, LXT 335	120/75 E1	PE-65862	T1091	PE-68862	PE-68822	T1218	PE-65586	PE-65351
	LXT 334, LXT 335	75 E1	PE-65866	T1092	PE-68866	PE-68826	—	PE-65389	PE-65351
	LXT 334, LXT 335		T1022	T1077	—	—	—	T1054	PE-64936
	LXT 336		PE-65861	T1090	PE-68828	PE-68828	T1220	—	PE-65351
	LXT 350, LXT 351, LXT 359	T1,E1	PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65351	PE-64936
	LXT 350, LXT 351		PE-65865	T1076	PE-68865	PE-68825	T1209	PE-65388	PE-65351
	LXT 350, LXT 351	120 E1	T1122	—	—	PE-68881	T1216	PE-65558	PE-65351
	LXT 360/361/362/363	T1,E1	PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65351	PE-64936
	LXT 360/361/362/363		PE-65865	T1076	PE-68865	PE-68825	T1209	PE-65388	PE-65351
	LXT 360, LXT361	120 E1	T1122	—	—	PE-68881	T1216	PE-65558	PE-65351
	LXT 380/381/384/386/388	T1/E1	PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65351	PE-64936
	LXT 380/381/384/386/388	T1/E1	PE-65861	T1090	PE-68861	PE-68841	—	PE-65351	PE-65351
	LXT 3104, LXT 3108		PE-65861	T1090	PE-68861	PE-68841	T1220	PE-64936	PE-64936
	LXT 3104, LXT 3108		TX1099	TX1099	—	—	—	—	—
Agere (Lucent)	T7288, T290A	CEPT	PE-65862	T1091	PE-68862	PE-68822	T1208	PE-65586	PE-65415
	T7289A	DS1	PE-65865	T1076	PE-68865	PE-68825	T1209	PE-65379	PE-65351
	T7630,T7688, T7690, T7698	CEPT	—	—	PE-68884	PE-68884	T1214	PE-65586	PE-65586
	T7630,T7689, T7690, T7698	DS1	PE-65870	T1093	PE-68874	PE-68874	T1211	PE-65379	PE-65379
	T7693,T7697	CEPT	T1137	TX1287	—	—	T1217	—	—
	TLIU04C1	DS1	PE-65870	T1093	PE-68874	PE-68874	T1211	PE-65379	PE-65379
	TLIU04C1	CEPT	—	—	PE-68884	PE-68884	T1214	PE-65586	PE-65586
Maxim (Dallas)	DS2196,2155,2149,21448		PE-68678	T1094	TX1277	TX1277	T1212	PE-65351	PE-64936
	DS2151/2152/2153/2154		PE-65865	T1076	PE-68865	PE-68825	T1213	PE-65388	PE-64936
	DS2151/2152/2153/2154		T1136	T1091	PE-68862	PE-68822	T1218	PE-65586	PE-64936
	DS2148/Q48/Q348/349/Q59	3V	PE-68678	T1094	TX1277	TX1277	T1212	PE-65351	PE-64936
	DS2148/Q48	5V	T1136	T1091	PE-68862	PE-68822	T1218	PE-65586	PE-64936
	DS21352/Q352, DS21354/Q354		PE-68678	T1094	TX1277	TX1277	T1212	PE-65351	PE-64936
	DS21552/Q552, DS21554/Q554		PE-65865	T1076	PE-68865	PE-68825	T1213	PE-65388	PE-64936
	DS21552/Q552, DS21554/Q554		T1136	T1091	PE-68862	PE-68822	T1218	PE-65586	PE-64936
	DS26502/3		PE-68678	T1094	TX1277	TX1277	T1212	PE-65351	PE-64936
	DS21455/8		PE-68678	T1094	TX1277	TX1277	T1212	PE-65351	PE-64936
	DS26528		PE-68678	T1094	TX1277	TX1277	T1212	PE-65351	PE-64936
Mindspeed	BT8510	T1/E1	PE-65866	T1092	PE-68866	PE-68826	T1212/T1210	PE-65389	PE-65351
	BT8510	T1/E1	T1021	T1092	T1021	PE-68826	T1212/T1210	PE-65389	PE-65351
	CN8380/28380		—	—	—	—	—	—	—
	BT8370/5/6	Better RI	T1190	T1091	PE-68862	PE-68822	T1218	PE-64937	PE-64936
	BT8370/5/6	Low Power	PE-65865	T1076	—	PE-68825	T1213	PE-65388	PE-64936
PMC-Sierra	PM4341/6341/4314		PE-65862	T1091	PE-68862	PE-68822	T1208	PE-64937	PE-65351
	PM4318/4319		PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	PM4323/4325		PE-65861	T1090	PE-68861	PE-68841	T1207	PE-65351	PE-65351
	PM4329		—	—	—	—	—	—	—
	PM4351/4354	COMET	T1137	TX1287	—	—	T1217	—	—
Zarlink (Mitel)	MT9071, MT9076		T1137	TX1287	—	—	T1217	—	—
	MT9076, MT9075		T1144	T1144	—	—	T1219	—	—
	MT9074, MT9075		PE-68678	T1094	PE-68877	PE-68877	T1212	PE-65351	PE-64934

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TELECOM IC CROSS REFERENCE

Pulse® A TECHNITROL COMPANY

IC CROSS REFERENCE: T1/E1/CEPT/ISDN-Pri FOR SINGLE & MULTIPORT PORT ICs

SINGLE THT		DUAL THT		REINFORCED 3 kVRMS			QUAD SMT		OCTAL SMT	PROTECTION MODULES		
EXTENDED TEMP		STD TEMP	EXT TEMP	STANDARD TEMP		DUAL SMT	STANDARD TEMP		STD TEMP	EXT TEMP	STD TEMP	EXT TEMP
TX	RX	TX	RX	TX	RX	TX & RX	TX	RX	TX & RX	TX &RX	TX & RX	TX & RX
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
PE-65770	PE-65771	PE-65565	PE-65567	PE-65838	PE-65835	T1034	T1007	T1006	T1070	T1110	—	—
PE-68664	PE-65771	PE-65566	PE-65568	PE-65839	PE-65835	T1049	T1009	T1006	T1068	T1108	—	—
PE-68664	PE-65771	PE-65566	PE-65568	PE-65839	PE-65835	T1049	T1009	T1006	T1071	T1111	—	—
PE-65771	PE-65771	PE-64951	—	PE-65838	PE-65835	T1045	T1006	T1006	T1073	T1113	—	—
PE-65770	PE-65770	—	—	PE-65838	PE-65838	T1033	T1007	T1007	T1064	T1104	—	—
PE-65771	—	PE-64951	PE-65568	PE-65835	PE-65835	T1031	T1006	T1006	T1068	T1108	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1081	—	—	—	—	—	—
PE-65770	PE-65771	PE-65565	PE-65567	PE-65838	PE-65835	T1034	T1007	T1006	T1070	T1110	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
PE-65770	PE-65770	—	—	PE-65838	PE-65838	T1033	T1007	T1007	T1064	T1104	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
PE-68664	PE-65778	PE-65566	PE-65568	PE-65839	PE-65834	T1049	T1009	T1009	T1071	T1111	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
PE-65771	PE-65778	PE-64951	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-65771	PE-65778	PE-64951	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-65771	PE-65778	PE-64951	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-65340	PE-65771	PE-64952	PE-65774	PE-65837	PE-65835	T1044	T1008	T1008	T1067	T1107	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1124	T1114	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1124	T1114	—	—
PE-65771	PE-65778	PE-64951	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-65771	PE-65778	PE-64951	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-65771	PE-65778	PE-64951	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
—	—	—	—	—	PE-68788	PE-68788	T1037	—	T1069	T1109	—	—
—	—	—	—	—	PE-68788	PE-68788	T1080	—	T1069	T1109	—	—
—	—	—	—	—	—	—	—	—	T1142	T1231	—	TX9031
—	—	—	—	—	—	—	—	—	—	—	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
PE-65770	PE-65771	PE-65565	PE-65567	PE-65838	PE-65835	T1034	T1016	T1016	T1070	T1110	—	—
PE-68664	PE-65771	PE-65566	PE-65568	PE-65839	PE-65835	T1049	T1009	T1009	T1071	T1111	—	—
—	—	—	—	—	—	T1047	T1017	T1017	—	—	—	—
PE-65771	PE-65778	PE-64954	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-68600	PE-65778	—	PE-64950	PE-65836	PE-65834	—	—	—	—	—	—	—
PE-65771	PE-65778	PE-64954	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
—	—	—	—	—	—	T1047	T1017	T1017	—	—	—	—
PE-65770	PE-65771	PE-65565	PE-65567	PE-65838	PE-65835	T1034	T1016	T1016	T1070	T1110	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1065	T1105	—	—
PE-65340	PE-65771	PE-64952	PE-65771	PE-65832	PE-65835	T1035	T1001	T1001	T1067	T1107	—	—
PE-68664	PE-65771	PE-65566	PE-65568	PE-65839	PE-65835	T1049	T1009	T1009	T1071	T1111	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
—	PE-65778	PE-64951	—	—	PE-65835	T1030	—	T1006	T1065	T1105	—	—
PE-65771	PE-65778	PE-64954	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-65770	PE-65771	PE-65565	PE-65567	PE-65838	PE-65835	T1034	T1016	T1016	T1070	T1110	—	—
—	—	—	—	—	—	T1047	T1017	T1017	—	—	—	—
PE-65771	PE-65778	PE-64954	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	—	—
PE-65770	PE-65771	PE-65565	PE-65567	PE-65838	PE-65835	T1034	T1016	T1016	T1070	T1110	—	—
—	—	PE-65565	—	—	—	T1047	T1017	T1017	—	—	—	—
PE-65771	PE-65778	PE-64954	—	PE-65835	PE-65834	T1031	T1006	T1006	T1068	T1108	T9030	T9030
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1124	T1114	T9030	T9030
PE-65778	PE-65778	PE-64951	—	PE-65835	PE-65835	T1030	T1006	T1006	T1068	T1108	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
PE-65340	PE-65771	PE-64952	PE-65774	PE-65832	PE-65835	T1044	T1008	T1008	T1067	T1107	—	—
PE-65770	PE-65771	PE-65565	PE-65567	PE-65838	PE-65835	T1034	T1007	T1006	T1070	T1110	—	—
PE-65340	PE-65340	—	—	PE-65832	PE-65832	T1036	T1010	T1010	T1063	T1103	—	—
PE-65770	PE-65770	—	—	PE-65838	PE-65838	T1033	T1007	T1007	T1064	T1104	—	—
—	—	—	—	—	—	—	—	—	—	T1180	—	—
PE-65770	PE-65770	—	—	PE-65838	PE-65838	T1033	T1007	T1007	T1064	T1104	—	—
PE-65340	PE-65340	—	—	PE-65832	PE-65832	T1036	T1010	T1010	T1063	T1103	—	—
PE-65771	PE-65778	PE-64951	PE-65568	PE-65838	PE-65838	T1031	T1006	T1006	T1068	T1108	—	—
PE-65770	PE-65778	PE-65565	PE-65567	PE-65838	PE-65834	T1032	T1007	T1006	T1070	T1110	—	—
PE-65340	PE-65778	PE-64952	PE-65774	PE-65832	PE-65834	T1038	T1001	T1001	TX1292	TX1292	—	—
PE-65771	PE-65778	PE-64951	PE-65568	PE-65838	PE-65838	T1031	T1006	T1006	T1068	T1108	—	—
PE-65340	PE-65778	PE-64952	PE-65774	PE-65832	PE-65834	T1038	T1001	T1001	TX1292	TX1292	—	—
PE-65771	PE-65778	PE-64951	PE-65568	PE-65838	PE-65838	T1031	T1006	T1006	T1068	T1108	—	—
PE-65770	PE-65778	PE-65565	PE-65567	PE-65838	PE-65834	T1032	T1007	T1006	T1070	T1110	—	—
PE-65340	PE-65778	PE-64952	PE-65774	PE-65832	PE-65834	T1038	T1001	T1001	TX1292	TX1292	—	—
PE-65771	PE-65778	PE-64951	PE-65568	PE-65838	PE-65838	T1031	T1006	T1006	T1068	T1108	—	—
PE-65771	PE-65778	PE-64951	PE-65568	PE-65838	PE-65838	T1031	T1006	T1006	T1068	T1108	—	—
PE-65771	PE-65778	PE-64951	PE-65568	PE-65838	PE-65838	T1031	T1006	T1006	T1068	T1108	—	—
PE-68664	PE-65771	PE-65566	PE-65568	PE-65839	PE-65835	T1049	T1009	T1006	T1071	T1111	—	—
PE-68664	PE-65771	PE-65566	PE-65568	PE-65839	PE-65835	T1049	T1009	T1006	T1071	T1111	—	—
—	—	—	—	—	—	—	T1006	T1006	T1124	T1114	—	—
PE-65340	PE-65771	PE-64952	PE-65774	PE-65832	PE-65834	T1038	T1006	T1001	T1067	T1107	—	—
PE-65770	PE-65771	PE-65565	PE-65567	PE-65838	PE-65834	T1032	T1006	T1007	T1070	T1110	—	—
PE-65340	PE-65771	PE-64952	PE-65774	PE-65832	PE-65835	T1044	T1008	T1008	T1067	T1107	—	—
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1073	T1113	—	TX9023
PE-65771	PE-65771	PE-64951	—	PE-65835	PE-65835	T1045	T1006	T1006	T1073	T1113	—	TX9023
—	—	—	—	—	—	—	—	—	—	—	—	TX9027
—	—	—	—	—	—	T1082	—	—	T1180	TX1299	T9021	TX9020
—	—	—	—	—	—	—	—	—	T1180	—	—	—
—	—	—	—	—	—	—	—	—	T1142	T1231	—	—
PE-65771	PE-65778	PE-64954	PE-65568	PE-65835	PE-65834	T1031	—	—	T1068	T1108	—	—

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