DIII-HF Series High Speed Devices

To improve switching losses for certain critical switching applications, Hitachi has introduced HF-Series with better built-in diode breakdown capability then the existing DIII-H series using life-time control technology.

The HF Series has built-in diodes which can be used as fast recovery diodes, FRD which means reducing switching losses sufficiently even for high-speed switching.

Table 8 : DIII-HF Series Typical Characteristics

Package	Type Number	Absolute Maximum Ratings				Electrical Characteristics			
		VDSS (V)	VGSS (V)	ID (A)	Pch (W)	10V RDS(on) (Ω) typ.	10V RDS(on) (Ω) max.	VGSS(off) (V)	trr (ns)
TO-3P	2SK2007	250	± 30	20	100	0.12	0.15	2 ~ 3	120
	2SK1669	250	± 30	30	125	0.075	0.095	2 ~ 3	90
	2SK1515	450	± 30	10	100	0.6	0.8	2 ~ 3	120
	2SK1516	500				0.7	0.9		
	2SK1517	450	± 30	20	120	0.2	0.25	2 ~ 3	120
	2SK1518	500				0.22	0.27		
TO-3PL	2SK1947	250	± 30	50	200	0.047	0.055	2 ~ 3	140
	2SK1519	450	± 30	30	200	0.11	0.15	2 ~ 3	120
	2SK1520	500				0.12	0.016		
	2SK1521	450	± 30	50	250	0.08	0.1	2 ~ 3	120
	2SK1522	500				0.085	0.11		
TO-3P-FM	2SK2008	250	± 30	20	60	0.12	0.15	2 ~ 3	120
	2SK1670	250	± 30	30	60	0.075	0.095	2 ~ 3	90
	2SK1405	600	± 30	15	60	0.35	0.5	2 ~ 3	140

DIII-H Series with High Electrostatic Breakdown Capability

One of the other key advantages of Hitachi Power MOSFETs has been including ESD protections with built-in gate to source back to back zener diodes from the DII-Series.

However, further improvements of gate electrostatic breakdown tolerance has been achieved with gate protection resistance insertion block.

Table 9 : DIII-L with Gate Protection Resistance

Type Number	Package	Absolute Maximum Ratings				Electrical Characteristics (typ.)							Non-Resistance Type
		VDSS (V)	VGSS (V)	ID (A)	Pch (Tc=25°C) (W)	4V RDS(on)* (Ω) typ.	4V RDS(on)* (Ω) max.	10V RDS(on)* (Ω) typ.	10V RDS(on)* (Ω) max.	td(off) (μs)	tf (μs)	Rg ** (Ω)	
2SJ235	DPAK	-60	±20	-3	20	0.4	0.55	0.28	0.4	16	8.2	7.25K	2SJ182
2SJ236	TO-220FM	-60	±20	-10	25	0.23	0.3	0.13	0.18	11	6.2	3.3K	2SJ175
2SJ237				-15	30	0.13	0.17	0.09	0.11	20	11	3K	2SJ176
2SK1776				10	20	0.17	0.22	0.12	0.15	3.1	1.4	1.55K	2SK1093
2SK1777				15	25	0.075	0.095	0.055	0.065	3.2	1.5	870	2SK1094
2SK1778		100		10		0.25	0.35	0.2	0.25	2.6	0.75	880	2SK1305

Notes :

* : Test condition $R_{DS(on)}$: V_{GS} = 4V, 10V, I_D = $^1/_2$ I_D max (DC)

** : Rg : Gate protection resistance value

Table 6 : DIII-L Series Typical Characteristics Cont'd

Package	Type Number	Absolute Maximum Ratings				Electrical Characteristics (typ.)							
		VDSS (V)	VGSS (V)	ID (A)	Pch * (W)	4V RDS(on)** (Ω)		10V RDS(on)** (Ω)		lyfsl (S) **	ton (ns)	toff (ns)	Ciss (pF)
						typ.	max.	typ.	max.				
TO-220AB	2SJ172	-60	±20	-10	40	0.18	0.25	0.13	0.18	6.5	73	275	900
	2SJ173			-15	50	0.13	0.17	0.09	0.11	9.5	135	380	1400
	2SJ174			-20	75	0.09	0.13	0.065	0.085	13	140	580	1850
	2SK970	60		10	30	0.17	0.22	0.12	0.15	6	60	230	400
	2SK971			15	40	0.075	0.095	0.055	0.065	12	80	300	860
	2SK972			25	50	0.05	0.06	0.033	0.04	20	145	450	1400
	2SK1296			30	75	0.03	0.04	0.024	0.028	27	145	615	2250
	2SK1300	100		10	40	0.25	0.35	0.2	0.25	7	65	240	525
	2SK1301			15	50	0.13	0.18	0.1	0.13	11	80	280	860
	2SK1302			20	50	0.085	0.12	0.065	0.085	16	112	450	1300
	2SJ247	-100		-8	40	0.3	0.45	0.25	0.3	5.5	59	225	880
	2SJ221			-20	75	0.15	0.22	0.12	0.16	12	130	490	1800
TO-220FM	2SJ175	-60	±20	-10	25	0.18	0.25	0.13	0.18	6.5	73	275	900
	2SJ236			-10	25	0.18	0.25	0.13	0.18	0.5	-	-	900
	2SJ176			-15	30	0.13	0.17	0.09	0.11	9.5	135	380	1400
	2SJ177			-20	35	0.09	0.13	0.065	0.085	13	140	580	1850
	2SK1253	30		30	35	0.035	0.045	0.025	0.03	22	155	700	1900
	2SK1093	60		10	20	0.17	0.22	0.12	0.15	6	60	230	400
	2SK1776			10	20	0.17	0.22	0.12	0.15	6	-	-	400
	2SK1094			15	25	0.075	0.095	0.055	0.065	12	80	300	860
	2SK1777			15	25	0.075	0.095	0.055	0.065	12	-	-	860
	2SK1095			25	30	0.05	0.06	0.033	0.04	20	145	450	1400
	2SK1305			10	25	0.25	0.35	0.2	0.25	7	65	240	525
	2SK1778	100		10	28	0.25	0.35	0.2	0.25	7	-	-	525
	2SK1306			15	30	0.13	0.18	0.1	0.13	11	80	280	860
	2SK1307			20	35	0.085	0.12	0.065	0.085	16	112	450	1300
	2SK1318	120		20	35	0.11	0.16	0.095	0.12	17	84	300	1300
	2SJ248	-100		-8	25	0.3	0.45	0.25	0.3	5.5	59	225	880
	2SJ222			-20	35	0.16	0.22	0.12	0.16	12	130	490	1800
TO-3P	2SK1297	60	±20	40	100	0.02	0.025	0.015	0.018	35	200	1050	3600
	2SK1514			40	125	0.035	0.055	0.024	0.03	28	170	620	2500
	2SK1665			45	125	0.026	0.035	0.018	0.022	32	210	920	3950
	2SJ215	-60		-35	125	0.07	0.09	0.045	0.06	18	195	780	2400
	2SJ217			-45	150	0.045	0.06	0.033	0.042	25	265	1120	3800
	2SK1303	100		30	100	0.06	0.09	0.05	0.06	22	135	585	1750
	2SK1304			40	100	0.03	0.04	0.025	0.03	35	195	1030	3500
TO-3P-FM	2SK1298	60	±20	40	50	0.02	0.025	0.015	0.018	35	200	1050	3600
	2SK1666			45	60	0.026	0.035	0.018	0.022	32	210	920	3950
	2SJ216	-60		-35	50	0.07	0.09	0.045	0.06	18	195	780	2400
	2SJ218			-45	60	0.045	0.06	0.033	0.042	25	265	1120	3800

Notes:

* : Value at Tc = 25°C

** : Test condition $R_{DS(on)}$: V_{GS} = 4V, 10V, $I_D = {}^1/_2 I_D$ max (DC)

*** : High Electro-Static Breakdown Capability Series

lyfsl : V_{DS} = 10V, $I_D = {}^1/_2 I_D$ max (DC)