



# 电子元器件系列

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# 第八代高性能N沟道功率MOS FET

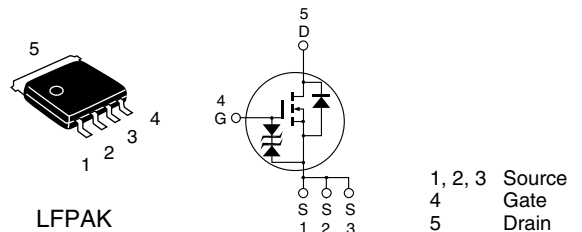
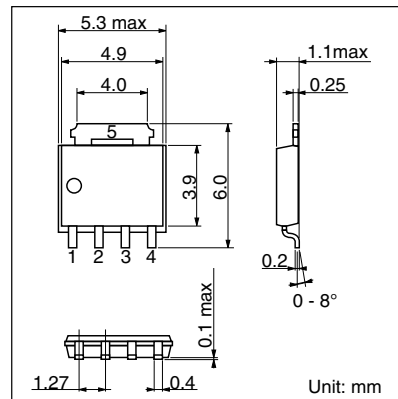
## 特点

- 在低电压驱动，是超低导通电阻。  
HAT2164H      4.5 V  $R_{DS(on)} = 3.0 \text{ mohm (typ)}$
- 高速开关 = 低Qgd  
HAT2165H      4.5 V  $R_{DS(on)} = 3.6 \text{ mohm (typ)}$   
 $Q_{gd} = 5.6 \text{ nC (typ)}$
- 小、薄型、低热阻封装LFAK
- 雪崩保证 (Avalanche rated)

## 优点

- 实现了电源的小、薄型化和高效率化。

## 外形尺寸图



## 主要电特性

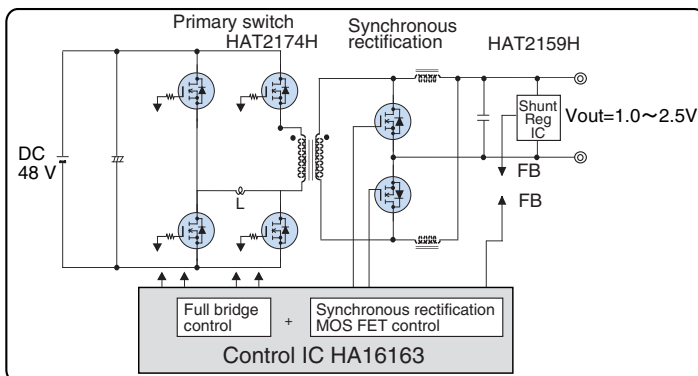
Type No.	Maximum Rating				RDS(on)(mΩ)				Qgd (nC)	Qg (nC)	Schedule		Note
	VDSS (V)	VGSS (V)	ID (A)	Pch (W)	VGS = 4.5V (7V)		VGS = 10V				WS	MP	
					typ	max	typ	max					
HAT2159H	20	±20	55	30	3.4	4.9	2.4	3.0	5.6	35	OK	10/02	Qg = VGS = 5V
HAT2160H			60	30	2.8	4.1	2.1	2.6	10	54	OK	10/02	Qg = VGS = 5V
HAT2161H			50	25	3.9	5.7	2.7	3.4	5.0	30	10/02	10/02	Qg = VGS = 5V
HAT2162H			40	20	5.9	8.6	4.0	5.0	3.1	19	OK	10/02	Qg = VGS = 5V
HAT2163H			30	15	8.6	12.5	5.7	7.1	2.0	12	OK	10/02	Qg = VGS = 5V
HAT2164H			60	30	3.0	4.4	2.5	3.1	15	60	OK	10/02	Qg = VGS = 5V
HAT2165H			55	30	3.6	5.3	2.6	3.3	5.6	35	OK	10/02	Qg = VGS = 5V
HAT2166H			45	25	4.2	6.1	3.0	3.8	5.0	30	OK	10/02	Qg = VGS = 5V
HAT2167H			40	20	6.4	9.3	4.4	5.5	3.1	19	OK	10/02	Qg = VGS = 5V
HAT2168H			30	15	9.3	13.5	6.3	7.9	2.0	12	OK	10/02	Qg = VGS = 5V
HAT2169H	40	±20	50	30	(3.8)	(5.2)	3.4	4.3	12	97	9/02	12/02	Qg = VGS = 10V
HAT2170H			45	30	(5.1)	(6.9)	4.5	5.6	6.8	62	9/02	12/02	Qg = VGS = 10V
HAT2171H			40	25	(6.1)	(8.3)	5.4	6.8	6.0	52	9/02	12/02	Qg = VGS = 10V
HAT2172H			30	20	(8.9)	(12.0)	7.8	9.8	4.0	32	9/02	12/02	Qg = VGS = 10V
HAT2173H	100	±20	25	30	(16.3)	(24)	14.2	17.8	14.5	78	OK	11/02	Qg = VGS = 10V
HAT2174H			20	25	(30)	(43)	26	32.5	7.5	40	OK	11/02	Qg = VGS = 10V
HAT2175H			15	20	(46)	(67)	40	50	5.0	28	OK	11/02	Qg = VGS = 10V

由于产品在开发中，有未事先通知而变更规格的情况。

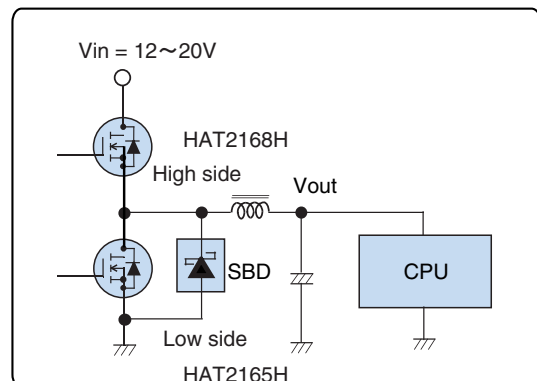
Schedule: month/year

## 应用举例

### ● 通信设备电源



### ● 非绝缘型DC-DC变换器







# SMALL SIGNAL TRANSISTOR

## ■ General Amplification

Package code	Type No.	Ratings		Characteristics		Status	
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	hFE	V <sub>CE(sat)</sub> (V) max		
SPAK	2SA1374	-55	-0.1	160~500	-0.5	○★	
	2SA1390	-35	-0.5	60~320	-0.6	○★	
	2SC3390	50	0.1	100~320	0.2	○★	
	2SC3413	30	0.1	100~500	0.2	○★	
	2SC3470	50	0.1	250~1200	0.2	※★	
	2SC3553	35	0.5	60~320	0.6	○★	
	2SC3836	50	0.3	800~2000	0.3	○★	
	2SD1504	15	0.5	250~1200	0.5	○★	
	TO-92	2SA673	-35	-0.5	60~320	-0.6	○★
		2SA673A	-50	-0.5	60~320	-0.6	○★
2SA836		-55	-0.1	160~500	-0.5	○★	
2SA844		-55	-0.1	160~500	-0.5	○★	
2SA872A		-120	-50 m	250~800	-0.5	○★	
2SA893		-90	-50 m	250~800	-0.5	※★	
2SA893A		-120	-50 m	250~800	-0.5	○★	
2SA1029		-30	-0.1	100~500	-0.2	○★	
2SA1030		-50	-0.1	100~320	-0.2	○★	
2SA1082		-120	-0.1	250~800	-0.2	※★	
2SA1084		-90	-0.1	250~800	-0.2	○★	
2SA1085		-120	-0.1	250~800	-0.2	○★	
2SA1188		-90	-0.1	250~800	-0.1	○★	
2SA1190		-90	-0.1	250~800	-0.1	○★	
2SA1191		-120	-0.1	250~800	-0.1	○★	
2SB561		-20	-0.7	85~240	-0.5	○★	
2SB1688		-300	-50 m	80~150	0.9	○★	
2SC458		30	0.1	100~500	0.2	○★	
2SC458LG		30	0.1	100~500	0.2	※★	
2SC1213		35	0.5	60~320	0.6	○★	
2SC1213A		50	0.5	60~320	0.6	○★	
2SC1214		50	0.5	60~320	0.6	○★	
2SC1344		30	0.1	250~1200	0.5	※★	
2SC1345		50	0.1	250~1200	0.5	○★	
2SC1775		90	50m	400~1200	0.5	○★	
2SC1775A		120	50 m	400~1200	0.5	○★	
2SC1890		90	50 m	250~1200	0.5	※★	
2SC1890A		120	50 m	250~1200	0.5	○★	
2SC2308		50	0.1	100~320	0.2	○★	
2SC2309		50	0.1	250~1200	0.2	○★	
2SC2310		50	0.1	100~320	0.2	※★	
2SC2396		60	0.1	250~1200	0.2	※★	
2SC2543		90	0.1	250~1200	0.2	※★	
2SC2544		120	0.1	250~800	0.2	※★	
2SC2545		60	0.1	250~1200	0.2	○★	
2SC2546		90	0.1	250~1200	0.2	○★	
2SC2547		120	0.1	250~800	0.2	○★	
2SC2853		90	0.1	250~800	0.1	○★	

		Ratings		Characteristics			
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	hFE	V <sub>CE(sat)</sub> (V) max		
TO-92	2SC2854	120	0.1	250~800	0.1	※★	
	2SC2855	90	0.1	250~800	0.1	※★	
	2SC2856	120	0.1	250~800	0.1	○★	
	2SD467	20	0.7	85~240	0.5	○★	
	2SD655	15	0.7	250~1200	0.5	○★	
	2SD2651	300	50 m	80~150	0.5	○★	
	2SB562	-20	-1.0	85~240	-0.5	○★	
	2SB647	-80	-1.0	60~320	-1.0	○★	
	2SB647A	-100	-1.0	60~200	-1.0	○★	
	2SB715	-100	-50 m	250~800	-0.2	※★	
TO-92	2SB716	-120	-50 m	250~800	-0.2	※★	
	2SB716A	-140	-50 m	250~500	-0.2	※★	
	2SB738	-16	-2.0	100~320	-0.3	※★	
	2SB739	-20	-2.0	100~320	-0.3	○★	
	2SB740	-50	-1.0	100~320	-0.6	○★	
	2SC1921	200	50 m	30~300	1.0	○★	
	2SC2610	300	0.1	30~200	1.5	○★	
	2SC4367	20	0.1	40~	1.0	○★	
	2SD468	20	1.0	85~240	0.5	○★	
	2SD667	80	1.0	60~320	1.0	○★	
	2SD667A	100	1.0	60~200	1.0	○★	
	2SD787	16	2.0	100~800	0.3	※★	
	2SD788	20	2.0	100~800	0.3	○★	
	2SD789	50	1.0	100~800	0.3	○★	
	2SD1922	25	0.8	250~1200	0.3	※★	
	MPAK	2SA1052	-30	-0.1	100~500	-0.2	○★
		2SA1121	-35	-0.5	60~320	-0.6	○★
		2SA1122	-55	-0.1	160~800	-0.5	○★
2SA1171		-90	-50 m	250~800	-0.5	○★	
2SA1484		-90	-0.1	250~800	-0.1	※★	
2SA1566		-120	-0.1	250~800	-0.1	○★	
2SA1617		-50	-0.1	100~320	-0.2	○★	
2SB831		-20	-0.7	85~240	-0.5	○★	
2SB1691		-50	-1	200~500	-0.3	○★	
2SC2462		40	0.1	100~500	0.2	○★	
2SC2463		50	0.1	250~1200	0.5	○★	
2SC2618		35	0.5	60~320	0.6	○★	
2SC4050		120	0.1	250~800	0.1	○★	
2SC4366		50	0.3	800~2000	0.3	※★	
2SC4702		300	50 m	60~150	0.5	○★	
2SD1101		20	0.7	85~240	0.5	※★	
2SD1306		15	0.7	250~800	0.5	○★	
2SD2655		50	1	200~500	0.3	○★	
CMPAK		2SA2080	-30	-100m	100~500	-0.2	○★
		2SA2081	-55	-100m	160~800	-0.5	○★
	2SC5850	40	100m	100~500	0.2	○★	

- 注) ○: 正在批量生产  
 SPL: 样品正在发货  
 △: 可以批量生产 (交货期为三个月)  
 ※: 限定品种  
 ★: 大量订货对象品种 (订货单位为 “500 个的整数倍”)

## ■ BRT Series (Small Signal Switching)

Package code	Type No.	Ratings		Characteristics			Status	
		V <sub>CC</sub> (V)	I <sub>O</sub> (mA)	V <sub>I(on)</sub> (V) max	G <sub>i</sub> min	R <sub>1</sub> (K $\Omega$ ) typ		R <sub>1/R2</sub> typ
TO-92	BRA114ETP	-50	-100	-2.4	30	10	1.0	※★
	BRA123ETP	-50	-100	-1.8	20	2.2	1.0	※★
	BRA124ETP	-50	-100	-3.0	56	22	1.0	※★
	BRA143ETP	-50	-100	-2.0	20	4.7	1.0	※★
	BRA144ETP	-50	-100	-4.5	70	47	1.0	※★
	BRC114ETP	50	100	2.4	30	10	1.0	※★
	BRC123ETP	50	100	1.8	20	2.2	1.0	※★
	BRC124ETP	50	100	3.0	56	22	1.0	※★
	BRC143ETP	50	100	2.0	20	4.7	1.0	※★
	BRC144ETP	50	100	4.5	70	47	1.0	※★
MPAK	BRA114EMP	-50	-100	-2.4	30	10	1.0	※★
	BRA123EMP	-50	-100	-1.8	20	2.2	1.0	※★
	BRA124EMP	-50	-100	-3.0	56	22	1.0	※★
	BRA143EMP	-50	-100	-2.0	20	4.7	1.0	※★
	BRA144EMP	-50	-100	-4.5	70	47	1.0	※★
	BRC114ECM	-50	-100	-2.4	30	10	1.0	※★

		Ratings		Characteristics				
		V <sub>CC</sub> (V)	I <sub>O</sub> (mA)	V <sub>I(on)</sub> (V) max	G <sub>i</sub> min	R <sub>1</sub> (K $\Omega$ ) typ		R <sub>1/R2</sub> typ
MPAK	BRC114EMP	50	100	2.4	30	10	1.0	※★
	BRC123EMP	50	100	1.8	20	2.2	1.0	※★
	BRC124EMP	50	100	3.0	56	22	1.0	※★
	BRC143EMP	50	100	2.0	20	4.7	1.0	※★
	BRC144EMP	50	100	4.5	70	47	1.0	※★
CMPAK	BRA114ECM	-50	-100	-2.4	30	10	1.0	※★
	BRA123ECM	-50	-100	-1.8	20	2.2	1.0	※★
	BRA124ECM	-50	-100	-3.0	56	22	1.0	※★
	BRA143ECM	-50	-100	-2.0	20	4.7	1.0	※★
	BRA144ECM	-50	-100	-4.5	70	47	1.0	※★
	BRC114ECM	50	100	2.4	30	10	1.0	※★
	BRC123ECM	50	100	1.8	20	2.2	1.0	※★
	BRC124ECM	50	100	3.0	56	22	1.0	※★
BRC143ECM	50	100	2.0	20	4.7	1.0	※★	
BRC144ECM	50	100	4.5	70	47	1.0	※★	

# SMALL SIGNAL TRANSISTOR

## ■ General Amplification

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	hFE	V <sub>CE(sat)</sub> (V) max	
UPAK	2SB1001	-16	-2.0	100~320	-0.3	○★
	2SB1002	-50	-1.0	100~320	-0.6	○★
	2SB1025	-80	-1.0	60~320	-1.0	○★
	2SB1026	-100	-1.0	60~200	-1.0	○★
	2SB1028	-160	-1.5	60~200	-1.0	○★
	2SC3380	300	0.1	30~200	1.5	○★

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	hFE	V <sub>CE(sat)</sub> (V) max	
UPAK	2SD1367	16	2.0	100~500	0.3	△★
	2SD1368	50	1.0	100~500	0.3	○★
	2SD1418	80	1.0	60~320	1.0	○★
	2SD1419	100	1.0	60~200	1.0	○★
	2SD1421	160	1.5	60~200	1.0	○★
	2SD1974	25	0.8	250~1200	0.4	△★

## ■ General Switching

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	hFE	V <sub>CE(sat)</sub> (V) max	
TO-92	2SA673A(K)	-50	-0.5	60~320	-0.6	○★
	2SA778(K)	-150	-50 m	30~	-1.0	※★
	2SA778A(K)	-180	-50 m	40~200	-1.0	○★
	2SC458(K)	30	0.1	100~500	0.4	○★
	2SC1213A(K)	50	0.5	60~320	0.6	○★

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	hFE	V <sub>CE(sat)</sub> (V) max	
TO-92	2SC1345(K)	50	0.1	250~1200	0.5	※★
	2SC1515(K)	150	50 m	30~300	1.0	○★
TO-92	2SD974	60	1.0	100~	0.3	○★

## ■ General Switching (Darlington transistor)

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	hFE	toff (μs) typ	
TO-92	2SC1472(K)	30	0.3	2 k~100 k	0.8	○★
TO-92 MOD	2SA1193(K)	-60	-0.5	2 k~	0.9	○★
	2SD1209(K)	60	1.0	4 k~	—	○★
	2SD1978	120	1.5	2 k~30 k	2.0	○★
	2SD2213	80	1.5	5 k~30 k	4.0	○★

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	hFE	toff (μs) typ	
MPAK-4	2SC3957	30	0.3	2 k~100 k	0.8	※★
UPAK	2SB1048	-60	-1.0	2 k~	0.9	○★
	2SD1470	60	1.0	2 k~100 k	—	○★
	2SD1472	120	1.5	2 k~30 k	2.0	○★

## ■ High Frequency Amplification

Package code	Type No.	Ratings		Characteristics				Status		
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	f <sub>r</sub> (GHz) typ	NF (dB) typ	f (GHz)	Cob (pF) max			
SPAK	2SC3391	20	20 m	0.94	3.5	0.1	1.2	○★		
TO-92	2SC460	30	0.1	0.23	—	—	3.5	○★		
	2SC461	30	0.1	0.23	—	—	3.5	○★		
	2SC535	20	20 m	0.94	3.5	0.1	1.2	○★		
	2SC1906	19	50 m	1.0	—	—	2.0	○★		
	2SC1907	19	50 m	1.1	—	—	2.0	○★		
	2SC2471	30	50 m	2.0	—	—	1.5	※★		
	2SC2512	20	50 m	0.9	—	—	—	※★		
	2SC3128	12	50 m	4.5	2.2	0.9	1.5	※★		
	2SC3510	12	50 m	4.5	2.2	0.9	1.5	※★		
	2SC3512	11	50 m	6.0	1.6	0.9	1.6	※★		
	2SC4308	20	0.3	2.5	—	—	4.0 typ	○★		
	2SC4629	9.0	50 m	8.0	1.2	0.9	1.85	※★		
	TO-92 MOD	2SC4693	20	0.3	2.5	—	—	4.5 typ	※★	
	MFPAK (1408)	2SC5543	8	20 m	8.5	1.1	0.9	0.9	○★	
		2SC5544	8	50 m	6	1.0	0.9	1.4	○★	
		2SC5554	9	20 m	7	1.4	0.9	0.9	○★	
		2SC5555	8	50 m	9	1.1	0.9	0.85	○★	
		2SC5628	6	50 m	5	1.1	0.9	1.3	○★	
		2SC5700	4	50 m	16.0	0.9	0.9	0.8	○★	
		2SC5702	6	50 m	7.8	1.1	0.9	0.9	○★	
		2SC5757	3.5	80 m	6.5	1.2	0.9	1.2	○★	
		2SC5758	3.5	80 m	8	1.2	0.9	0.95	○★	
		2SC5812	4	50 m	15	1	0.9	0.4	○★	
		SMPAK	2SC5137	8.0	20 m	10	1.5	0.9	0.8	△★
			2SC5139	8.0	50 m	11	1.1	0.9	1.1	○★
			2SC5247	8	50 m	13.5	1.2	0.9	0.75	○★
2SC5629	6		50 m	5	1.1	0.9	1.3	○★		
CMPAK	2SC4260	13	50 m	3.8	—	—	1.5	○★		
	2SC4261	15	50 m	2.4	—	—	1.0	○★		
	2SC4262	15	50 m	2.9	—	—	1.0	○★		
	2SC4264	11	50 m	3.5	—	—	1.5	○★		
	2SC4265	20	50 m	1.2	—	—	1.5	○★		
	2SC4463	20	50 m	1.0	—	—	—	※★		
	2SC4537	11	50 m	6.0	1.6	0.9	1.5	○★		
	2SC4593	9.0	50 m	9.0	1.2	0.9	1.5	※★		
	2SC4784	8.0	20 m	10	1.2	0.9	0.8	○★		
	2SC4899	9.0	20 m	9.0	1.2	0.9	0.85	○★		

Package code	Type No.	Ratings		Characteristics				Status	
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	f <sub>r</sub> (GHz)	NF (dB) typ	f (GHz)	Cob		
CMPAK	2SC4901	9.0	50 m	9.0	1.2	0.9	1.4	○★	
	2SC4965	8.0	100m	—	—	—	1.6	○★	
	2SC5051	8.0	50 m	11	1.1	0.9	1.15	○★	
	2SC5851	30	100m	0.23	5.5	0.1	1.6	○★	
	2SC4995	8.0	50 m	11	1.1	0.9	1.05	○★	
	2SC5081	8.0	50 m	13.5	1.1	0.9	0.75	○★	
CMPAK-4	2SC5593	4	12 m	23	1.9	1.8	0.4	○★	
	2SC5594	4	35 m	22	1.2	1.8	0.6	○★	
	2SC5623	3.5	12 m	27	1.8	1.8	0.4	○★	
	2SC5624	3.5	35 m	28	1.2	1.8	0.6	○★	
	2SC5820	4.6	35	20	1.4	1.8	0.15	○★	
	2SC5894	4.6	12	20	2	1.8	0.29	SPL★	
	MPAK	2SC2619	30	0.1	0.23	—	—	3.5	○★
		2SC2620	20	20 m	0.94	—	—	1.2	○★
		2SC2732	25	20 m	1.0	—	—	0.8	※★
		2SC2734	11	50 m	3.5	—	—	1.5	○★
		2SC2735	20	50 m	1.2	—	—	1.5	○★
		2SC2736	20	50 m	2.2	—	—	1.0	※★
		2SC2776	20	30 m	0.32	5.5	0.1	1.5	※★
		2SC3127	12	50 m	4.5	2.2	0.9	1.5	○★
2SC3513		11	50 m	6.0	1.6	0.9	1.5	※★	
2SC3793		15	50 m	2.9	—	—	1.0	※★	
2SC4196		15	50 m	2.4	—	—	1.0	○★	
2SC4197		13	50 m	3.8	—	—	1.3	○★	
2SC4591		9.0	50 m	9.0	1.2	0.9	1.5	○★	
2SC4680		8.0	50 m	—	—	—	1.5	※★	
2SC4964		8.0	100m	—	—	—	1.6	※★	
2SC5049		8.0	20 m	10	1.2	0.9	0.8	○★	
2SC5050		8.0	50 m	11	1.1	0.9	1.1	○★	
2SC5218	9.0	50 m	9.0	1.2	0.9	1.4	○★		
2SC5772	9	100m	9	1.1	0.9	0.9	○★		
2SC5773	6	80 m	10.8	1.1	0.9	1.25	○★		
MPAK-4	2SC4926	8.0	50 m	11	1.1	0.9	1.1	○★	
	2SC5080	8.0	50 m	13.5	1.1	0.9	0.75	△★	
	2SC5545	6.0	50 m	13	1.1	0.9	1.1	○★	
UPAK	2SC4807	15	200m	4.4	2.5	0.9	2.8	○★	
	2SC4988	9.0	100m	8.5	1.3	0.9	1.6	○★	
	2SC5631	6.0	80 m	11	1.8	0.9	2.0	○★	

## ■ Twin Transistors

Package code	Type No.	Ref. Chip Q1						Ref. Chip Q2						Status		
		Ratings		Characteristics		Cre (pF)	Ratings		Characteristics		Cre (pF)					
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	f <sub>r</sub> (GHz) typ	NF (dB) typ		f (GHz)	V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	f <sub>r</sub> (GHz) typ		NF (dB) typ	f (GHz)			
SMFPAK-6	HTT1115S	2SC5700	4	50 m	13	1.0	0.9	0.3	2SC5757	3.5	80 m	6	1.5	0.9	0.8	○★
	HTT1213S	2SC5700	4	50 m	12	1.0	0.9	0.3	2SC5700	4.0	50 m	12	1.0	0.9	0.3	○★
EMFPAK-6	HTT1115E	2SC5700	4	50 m	13	1.0	0.9	0.3	2SC5757	3.5	80 m	6	1.5	0.9	0.8	○★
	HTT1213E	2SC5700	4	50 m	12	1.0	0.9	0.3	2SC5700	4.0	50 m	12	1.0	0.9	0.9	○★

# SMALL SIGNAL FET

## High Frequency Amplification

Package code	Type No.	Ratings		Characteristics				Status
		V <sub>DS</sub> (V)	I <sub>D</sub> (A)	C <sub>iss</sub> (pF) typ	PG(dB) typ	NF (dB) typ	f (GHz)	
SPAK	2SK439	20	30m	2.5	30	2.0	0.1	○★
TO-92	2SK168	30	20m	5.0	27	1.7	0.1	※★
	2SK359	20	30m	2.5	30	2.0	0.1	○★
CMPAK	2SK1215	20	30m	2.5	30	2.0	0.1	○★
CMPAK-4	2SK2685☆	6	20m	0.80	21	0.5	0.9	○★
	3SK296	12	25m	1.5	19.5	2.0	0.9	○★
	3SK298	12	25m	2.9	25	1.0	0.2	○★
	3SK309☆	6	18m	0.39	21	1.25	0.9	○★
	3SK317	14	25m	3.0	27.6	1.0	0.2	○★
	3SK318	6	20m	1.7	21.5	1.6	0.9	○★
	BB101C	6	25m	1.7	20	2.1	0.9	○★
	BB102C	12	25m	1.6	20	2.1	0.9	※★
	BB301C	6	25m	3.1	26	1.3	0.2	○★
	BB302C	12	25m	3.0	26	1.7	0.2	※★
	BB303C	7	25m	3.3	32	1.0	0.2	△★
	BB304C	12	25m	3.1	29	1.2	0.2	○★
	BB305C	12	25m	3.1	28	1.5	0.2	○★
	BB501C	6	20m	1.7	21.5	1.8	0.9	○★
	BB502C	6	20m	1.7	22	1.6	0.9	○★
	BB503C	6	20m	1.7	22	1.8	0.9	△★
	BB504C	6	30m	2.1	22	1.75	0.9	△★
	BIC702C	6	20m	2.0	23	1.6	0.9	※★
	BIC703C	6	30m	2.0	22	1.8	0.9	※★

		Ratings		Characteristics				
		V <sub>DS</sub>	I <sub>D</sub>	C <sub>iss</sub>	PG(dB)	NF (dB)	f (GHz)	
MPAK	2SK217	30	20m	6.8	27	1.7	0.1	※★
	2SK360	20	30m	2.5	30	2.0	0.1	○★
MPAK-4	3SK295	12	25m	1.5	19.5	2.0	0.9	○★
	3SK297	12	25m	2.9	25	1.0	0.2	○★
	3SK300	14	25m	3.1	27.6	1.0	0.2	○★
	3SK319	6	20m	1.7	21.5	1.6	0.9	○★
	BB101M	6	25m	1.7	20	2.1	0.9	○★
	BB102M	12	25m	1.6	20	2.1	0.9	○★
	BB301M	6	25m	3.1	26	1.3	0.2	○★
	BB302M	12	25m	3.0	26	1.7	0.2	※★
	BB303M	7	25m	3.3	32	1.0	0.2	△★
	BB304M	12	25m	3.1	29	1.2	0.2	○★
	BB305M	12	25m	3.1	28	1.5	0.2	○★
	BB501M	6	20m	1.7	21.5	1.8	0.9	○★
	BB502M	6	20m	1.7	22	1.6	0.9	△★
BB503M	6	20m	1.7	22	1.8	0.9	△★	
BB504M	6	30m	2.1	22	1.75	0.9	△★	
BIC702M	6	20m	2.0	23	1.6	0.9	※★	
BIC703M	6	30m	2.0	22	1.8	0.9	※★	

## High Frequency Amplification (Twin Type)

Package code	Type No.	Ratings		Characteristics (FET-1)				Characteristics (EET-2)				Status
		V <sub>DS</sub> (V)	I <sub>D</sub> (A)	C <sub>iss</sub> (pF) typ	lyfsl (mS) typ	NF (dB) typ	f (GHz)	C <sub>iss</sub> (pF) typ	lyfsl (mS) typ	NF (dB) typ	f (GHz)	
CMPAK-6	TBB1001	6	40m	3.5	42	1.2	0.2	3.5	42	1.2	0.2	△★
	TBB1002	6	30m	1.8	26	1.7	0.9	2.6	25	1.2	0.2	○★
	TBB1004	6	30m	1.8	26	1.7	0.9	2.7	32	1.2	0.2	○★
	TBB1005	6	30m	1.8	26	1.7	0.9	2.6	25	1.2	0.2	△★

## μ-FET Series (Small signal switching)

Package code	Type No.	V <sub>DSS</sub> (V)	I <sub>D</sub> (A)	RDS(on) (Ω)								C <sub>iss</sub>	Status
				VGS = 10V		VGS = 4V		VGS = 2.5V		VGS = 1.5V			
MPAK	2SJ574	-30	-0.3	1.1	1.3	2.2	3.1	—	—	—	—	50	○★
	2SJ575	-30	-0.1	2.8	3.3	5.7	7.9	—	—	—	—	25	△★
	2SK3287	30	0.3	1.26	1.44	2.8	3.44	—	—	—	—	6	○★
	2SK3288	30	0.1	2.7	3.5	4.7	7.0	—	—	—	—	3	○★
	2SK3290	30	0.5	0.46	0.525	0.9	1.25	—	—	—	—	5	○★
CMPAK	2SJ576	-30	-0.1	2.8	3.3	5.7	7.9	—	—	—	—	25	○★
	2SJ586	-20	-0.1	—	—	4.1	5.0	6.0	8.5	—	—	28	○★
	2SK3289	30	0.3	1.26	1.44	2.8	3.44	—	—	—	—	6	○★
	2SK3348	20	0.1	—	—	1.6	1.9	2.2	3.2	—	—	18	○★
	2SK3378	30	0.1	2.7	3.5	4.7	7.0	—	—	—	—	1.6	○★
SMPAK	2SJ587	-20	50m	—	—	8.5	11.0	15.0	22.0	—	—	13	○★

				RDS(on) (Ω)									
				VGS = 10V		VGS = 4V		VGS = 2.5V		VGS = 1.5V			
SMPAK	2SK3349	20	50m	—	—	2.8	3.6	4.8	7.2	—	—	6	○★
	H5N0301SM	30	50m	—	—	6	7.2	9	13	—	—	12	△★
MFPAK	H5P0301SM	-30	50m	—	—	16	20	22	30	—	—	15	△★
	H5N0201MF	20	0.05	—	—	2.8	3.6	4.8	7.2	—	—	6	△★
	H5N0301MF	30	0.05	—	—	6	7.2	9	13	—	—	12	△★
CMPAK-	H5P0201MF	-20	-0.05	—	—	8.5	11.0	15.0	22.0	—	—	13	△★
	H5P0301MF	-30	-0.05	—	—	16	20	22	30	—	—	15	△★
	HAT1066G	-30	-0.05	—	—	16	20	22	31	—	—	12	SPL
	HAT2106G	30	0.05	—	—	6.5	8	10	14	—	—	15	SPL
	HAT3016G	-30/30	-0.05/0.05	—	—	16/6.5	20/8	22/10	31/20	—	—	12/15	SPL

## General Amplification

Package code	Type No.	Ratings		Characteristics		Status	
		V <sub>DS</sub> (V <sub>DSX</sub> ) (V)	V <sub>GSS</sub> (V <sub>GSS</sub> ) (V)	I <sub>D</sub> (I <sub>G</sub> ) (A)	lyfsl (mS) min		I <sub>DSS</sub> (mA)
SPAK	2SK494	22	—	0.1	20	6~40	○★
TO-92	2SK435	22	—	0.1	20	6~40	○★
MPAK	2SK1070	—	(-22)	50m	20	6~40	○★

注) ○: 正在批量生产  
 SPL: 样品正在发货  
 △: 可以批量生产 (交货期为三个月)  
 ※: 限定品种  
 ★: 大量订货对象品种 (订货单位为“500个的整数倍”)  
 ☆: GaAs



## GaAs LINEAR IC

### High Frequency Linear IC

Package code	Type No.	Function & Characteristics	Status
MPAK-5	HA22022	LNA, $V_{DD} = 3\text{ V}$ , $I_{DD} = 3\text{ mA typ}$ , $NF = 1.3\text{ dB typ}$ ( $f = 1.5\text{ GHz}$ ), $PG = 16\text{ dB typ}$ ( $f = 1.5\text{ GHz}$ )	○
	HA22033	LNA, $V_{DD} = 2.7\text{ V}$ , $I_{DD} = 1.7\text{ mA typ}$ , $NF = 1.4\text{ dB typ}$ ( $f = 1.5\text{ GHz}$ ), $PG = 14\text{ dB typ}$ ( $f = 1.5\text{ GHz}$ )	○

Package code	Type No.	Function & Characteristics	Status
MPAK-6	HA22040	PDC MIXER, $CG = 10\text{ dB typ}$ , $NF = 45\text{ dB typ}$ ( $V_{CC} = 2.7\text{ V}$ , $I_D = 6\text{ mA}$ , $f = 1.5\text{ GHz}$ )	○
TNP-16BV	HA22052	CDMA/LNA+MIXER, $V_{DD} = 2.8\text{ V}$ , $I_{DD} = 20\text{ mA}$ , $f = 894\text{ MHz}$	○

## HIGH FREQUENCY POWER MOS FET

### High Frequency Power Amplification

Package code	Type No.	Ratings		Characteristics				Status
		$V_{DSS}$ (V)	$I_D$ (A)	Pout (W) typ				
				f (MHz)	Pin (W)	$V_{DD}$ (V)		
RFPK-F	2SK3174A	60	16	270	860	14	28	SPL
	2SK3464	60	14	180	1482	10	28	△
	2SK3540	60	20	390	860	24	28	△
	2SK3545	60	20	260	2140	20	28	SPL
RFPK-G	2SK3175A	60	8	135	860	7	28	SPL
	2SK3465	60	7	90	1482	5	28	△

		Ratings		Characteristics				
		$V_{DSS}$	$I_D$	Pout (dBm) min				
				f (MHz)	Pin (dBm)	$V_{DD}$ (V)		
UPAK	2SK3391	17	0.3	32	836	14	13.7	○
RP8P	2SK3390	17	1	38	836	21	13.7	○

# POWER TRANSISTOR

## ■ General Amplification

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	h <sub>FE</sub>	V <sub>CE(sat)</sub> (V) max	
DPAK	2SB1407(L)/(S)	-35	-2.5	60~320	-1.0	○
	2SB1409(L)/(S)	-160	-1.5	60~200	-1.0	○
	2SD2121(L)/(S)	35	2.5	60~320	1.0	○
	2SD2122(L)/(S)	120	1.5	60~200	1.0	※
	2SD2123(L)/(S)	160	1.5	60~200	1.0	○

		Ratings		Characteristics		
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	h <sub>FE</sub>	V <sub>CE(sat)</sub> (V) max	
TO-220	2SB857	-50	-4.0	60~320	-1.0	○
	2SB858	-60	-4.0	60~320	-1.0	○
	2SB859	-80	-4.0	60~200	-2.0	○
	2SB860	-100	-4.0	50~250	-1.0	○
	2SB861	-150	-2.0	60~200	-3.0	○
	2SD1133	50	4.0	60~320	1.0	○
	2SD1134	60	4.0	60~320	1.0	○
	2SD1135	80	4.0	60~200	2.0	○

## ■ General Switching

Package code	Type No.	Ratings			Characteristics		Status
		V <sub>CEO</sub> (V)	V <sub>CB0</sub> (V <sub>CEs</sub> ) (V)	I <sub>C</sub> (A)	V <sub>CE(sat)</sub> (V) max	t <sub>r</sub> (μs) max	
DPAK	2SC4499(L)/(S)	400	500	0.5	1.0	1.0	○
	2SD2115(L)/(S)	60	150	2.0	0.8	0.6	○
TO-220 AB	2SB566(K)	-50	-70	-40	-1.0	0.5 typ	○
	2SB566A(K)	-60	-70	-40	-1.0	0.5 typ	○
	2SC2612	400	500	3.0	1.0	1.0	○
	2SC2613	400	500	5.0	1.0	1.0	○
	2SC2816	400	500	5.0	1.0	0.5	○
	2SC2898	400	500	8.0	1.0	0.8	○
	2SC2979	800	900	3.0	1.0	0.8	○
	2SC4913	2000	2000	20 m	5.0	—	○
	2SC5273	1300	1300	0.03	5.0	—	○
	2SD476(K)	50	70	4.0	1.0	0.5 typ	○
	2SD476A(K)	60	70	4.0	1.0	0.5 typ	○

		Ratings			Characteristics		
		V <sub>CEO</sub> (V)	V <sub>CB0</sub> (V <sub>CEs</sub> ) (V)	I <sub>C</sub> (A)	V <sub>CE(sat)</sub> (V) max	t <sub>r</sub> (μs) max	
TO-220	2SD1137	100	100	4.0	1.0	—	○
	2SD1138	150	200	2.0	3.0	—	○
	2SD1163	120	300	7.0	2.0	0.5	○
	2SD1163A	150	350	7.0	1.0	0.5	○
	2SD1527	1000	—	0.5	5.0	—	○
TO-220	2SB1392	-60	-70	-4.0	-1.0	—	○
	2SB1530	-150	-200	-2.0	-3.0	—	△
	2SC5022	1500	1500	20 m	5.0	—	○
	2SD2107	60	70	4.0	1.0	—	○
	2SD2337	150	200	2.0	3.0	—	○
TO-3P	2SC3336	400	500	15	1.0	0.5	○
	2SC3365	400	500	10	1.0	1.0	○

## ■ General Switching (Darlington transistor)

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	h <sub>FE</sub>	t <sub>off</sub> (μs) typ	
DPAK	2SC4500(L)/(S)	60	1.0	2 k~	0.6	○
	2SD2124(L)/(S)	120	1.5	2 k~30 k	2.0	○
TO-220 AB	2SB727(K)	-120	-6.0	1 k~20 k	3.0	○
	2SB791(K)	-120	-8.0	1 k~20 k	3.1	○
	2SB955(K)	-120	-10	1 k~20 k	4.0	○
	2SB1091	-60	-8.0	1 k~20 k	3.0	○
	2SB1103	-60	-8.0	1 k~20 k	4.0	○
	2SC1881(K)	60	3.0	1 k~	5.0	○
	2SD768(K)	120	6.0	1 k~20 k	3.0	○
	2SD970(K)	120	8.0	1 k~20 k	6.5	○
	2SD1113(K)	300	6.0	500~	23	○
	2SD1126(K)	120	10	1 k~20 k	8.0	○
	2SD1606	120	6.0	1 k~20 k	9.0	○
	2SD1976	300	6.0	500~	16.0	○

		Ratings		Characteristics			
		V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	h <sub>FE</sub>	t <sub>off</sub> (μs) typ		
TO-220	2SB1389	-60	-4.0	1 k~20 k	5.0	○	
	2SB1390	-60	-8.0	1 k~20 k	4.0	○	
	2SB1391	-120	-8.0	1 k~20 k	3.1	○	
	2SB1399	-120	-10	1 k~20 k	4.0	○	
	2SB1400	-120	-6.0	1 k~20 k	3.0	○	
	2SD2101	200	10	1500~	11.5	○	
	2SD2104	120	8.0	1 k~20 k	6.5	○	
	2SD2106	120	6.0	1 k~20 k	3.0	○	
	TO-3P	2SB1032(K)	-120	-10	1 k~20 k	4.0	○
		2SB1079	-100	-20	1 k~20 k	3.5	○
2SB1494		-120	-25	2 k~20 k	10	○	
2SD1436(K)		120	10	1 k~20 k	4.0	○	
	2SD1559	100	20	1 k~20 k	12.0	○	

注) ○: 正在批量生产

SPL: 样品正在发货

△: 可以批量生产 (交货期为三个月)

※: 限定品种

★: 大量订货对象产品 (订货单位为“500个的整数倍”)

# POWER MOS FET

## General Switching

Package code	Type No.	Ratings		Characteristics			Ciss (pF) typ	Status
		Vdss (V)	Id (A)	Rds(ON) (Ω) max		Ciss (pF) typ		
				4 V (5 V)	10 V (2.5 V)			
TO-92	2SK1336	60	0.3	2.5	1.7	33	△★	
	2SK1337	100	0.3	6.5	4.5	35	△★	
TO-92 MOD	2SJ386	-30	-3.0	0.8	0.4	177	○★	
	2SJ483	-30	-5.0	0.17	0.11	630	△★	
	2SJ496	-60	-5	0.24	0.16	600	○★	
	2SK975	60	1.5	0.55	0.4	140	○★	
	2SK2085	100	1	1.35	0.9	130	△★	
	2SK2734	30	5	0.08	0.055	550	△★	
	2SK2851	60	5	0.1	0.07	500	○★	
	2SK3446	150	1	1.95	(2.5)	95	△★	
	2SK3447	150	1	2.5	1.95	85	△★	
	MPAK	2SJ399	-30	-0.2	5.0	3.0	1.1	○★
		2SJ451▼	-20	-0.2	3.5	(9)	2.4	○★
2SJ452▼		-50	-0.2	7.0	(12)	1.1	※★	
2SJ486▼		-30	-0.3	0.65	(1.2)	45	○★	
2SK2373		30	0.2	2.5	1.4	17.8	○★	
2SK2569▼		50	0.2	2.6	(5)	14	○★	
2SK2570▼		20	0.2	1.1	(2.2)	45	○★	
2SK2802▼		30	0.5	0.28	(0.5)	14	※★	
2SK2980▼		30	1.0	0.28	(0.5)	155	○★	
2SK3000		40	1	0.5	0.3	14	○★	
UPAK		2SJ186	-200	-0.5	—	12	75	○★
		2SJ244▼	-12	-2.0	0.5*	(0.9)	130	○★
		2SJ278	-60	-1.0	1.2	0.83	160	○★
		2SJ317▼	-12	-2.0	0.35	0.7 (-2.2V)	63	○★
	2SJ361▼	-20	-2.0	—	(1.5)	3.2	※★	
	2SJ484	-30	-2.0	0.45	0.23	230	○★	
	2SJ517▼	-20	-2.0	0.24	(0.43)	320	○★	
	2SJ518	-60	-2.0	0.63	0.46	220	△★	
	2SK1334	200	1.0	—	3.8	80	○★	
	2SK1579▼	12	2.0	0.35	0.7 (2.2V)	110	○★	
	2SK1697	60	0.5	2.5	1.7	33	○★	
	2SK1698	100	0.3	6.5	4.5	35	※★	
	2SK1764	60	2.0	0.6	0.45	140	○★	
	2SK1772	30	1.0	0.85	0.6	30	○★	
	2SK2247	30	2.0	0.45	0.35	177	※★	
	2SK2315▼	60	2.0	0.45	0.6 (3V)	173	○★	
	2SK2788	60	2.0	0.25	0.16	180	○★	
	2SK2978▼	20	2.5	0.12	(0.2)	260	△★	
	DPAK	2SJ130(L)(S)	-300	-1.0	—	8.5	235	○
		2SJ181(L)(S)	-600	-0.5	—	25	220	○
2SJ319(L)(S)		-200	-3.0	—	2.3	330	○	
2SJ387(L)(S)▼		-20	-10	0.07	(0.11)	1170	○	
2SJ506(L)(S)		-30	-10	0.18	0.085	630	○	
2SJ527(L)(S)		-60	-5	0.8	0.4	220	○	
2SJ528(L)(S)		-60	-7	0.37	0.22	400	○	
2SJ529(L)(S)		-60	-10	0.24	0.16	580	○	
2SJ530(L)(S)		-60	-15	0.16	0.1	850	○	
2SK1151(L)(S)		450	1.5	—	5.5	160	○	
2SK1152(L)(S)		500	1.5	—	6	160	○	
2SK1254(L)(S)		120	3.0	0.55	0.4	420	○	
2SK1299(L)(S)		100	3.0	0.45	0.35	400	※	
2SK1335(L)(S)		200	3.0	—	0.8	380	※	
2SK1838(L)(S)		250	1.0	—	8	60	○	
2SK1880(L)(S)		600	1.5	—	8	250	○	
2SK2059(L)(S)		600	3.0	—	5	295	△	
2SK2084(L)(S)		20	7.0	0.075	0.053	800	○	
2SK2329(L)(S)▼		30	10	0.04	(0.06)	1250	○	
2SK2735(L)(S)		30	20	0.05	0.028	750	○	
2SK2796(L)(S)		60	5	0.25	0.16	180	○	
2SK2869(L)(S)		60	20	0.07	0.045	740	○	
2SK2925(L)(S)		60	10	0.16	0.08	350	○	
2SK2926(L)(S)		60	15	0.11	0.055	500	○	
2SK3147(L)(S)		100	5	0.17	0.13	420	○	

		Ratings		Characteristics				
		Vdss	Id	Rds(ON) (Ω) max		Ciss		
				4 V (5 V)	10 V (2.5 V)			
DPAK	2SK3274(L)(S)	30	30	0.03	0.013	1500	○	
	H5N2004DL/DS	200	8	—	0.48	450	○	
	H5N2005DL/DS	200	6	—	0.65	300	○	
	H5N2504DL/DS	250	7	0.67	0.63	570	○	
	H5N2505DL/DS	250	5	—	0.89	300	○	
	H5N2508DL/DS	250	7	—	0.63	450	○	
	H5N2510DL/DS	250	5	0.97	0.89	390	○	
	H5N5006DL/DS	500	3	—	3.0	365	○	
	TO-220	2SJ221	-100	-20	0.22	0.16	1800	○
		2SJ247	-100	-8.0	0.45	0.3	880	○
2SJ539		-60	-10	0.36	0.21	400	○	
2SJ540		-60	-12	0.23	0.15	580	○	
2SJ541		-60	-15	0.155	0.095	850	○	
2SJ542		-60	-18	0.11	0.065	1300	○	
2SJ543		-60	-20	0.095	0.055	1750	○	
2SJ544		-60	-30	0.055	0.037	2500	○	
2SK740		150	10	—	1.5	1200	○	
2SK1153		450	3.0	—	2.8	330	○	
2SK1154		500	3.0	—	3	330	○	
2SK1155		450	5.0	—	1.4	640	○	
2SK1156		500	5.0	—	1.5	640	○	
2SK1157		450	7.0	—	0.8	1050	○	
2SK1158		500	7.0	—	0.9	1050	○	
2SK1159		450	8.0	—	0.7	1150	○	
2SK1160		500	8.0	—	0.8	1150	○	
2SK1300		100	10	0.35	0.25	525	○	
2SK1301		100	15	0.18	0.13	860	○	
2SK1302		100	20	0.12	0.085	1300	○	
2SK1338		900	2.0	—	7	425	○	
2SK1400		300	7.0	—	0.7	635	○	
2SK1400A		350	7.0	—	0.8	635	○	
2SK1402		600	4.0	—	2.4	600	○	
2SK1402A		650	4.0	—	2.6	600	○	
2SK1667		250	7.0	—	0.55	690	○	
2SK1761		250	12	—	0.35	1100	○	
2SK1807		900	4.0	—	4	740	○	
2SK1809		600	5.0	—	1.5	1000	○	
2SK2328		650	7.0	—	1.4	1180	○	
2SK2408▲		500	7	—	0.9	1100	○	
2SK2590		200	7	—	0.45	700	○	
2SK2800		60	40	0.04	0.02	1500	○	
2SK2927		60	10	0.15	0.075	350	○	
2SK2928		60	15	0.105	0.052	500	○	
2SK2929		60	25	0.07	0.034	740	○	
2SK2930		60	35	0.05	0.026	1100	△	
2SK2931		60	45	0.025	0.013	2200	○	
2SK2959	30	50	0.018	0.01	2000	○		
2SK3069	60	75	0.012	0.0075	7100	○		
2SK3080	30	30	0.05	0.028	750	△		
2SK3081	30	45	0.025	0.014	1570	○		
2SK3136	40	75	0.010	0.0058	6800	○		
2SK3141	30	75	0.0085	0.005	6800	○		
2SK3149	100	20	0.085	0.060	840	△		
2SK3154	150	15	0.15	0.13	850	○		
2SK3156	150	20	0.08	0.07	1750	○		
2SK3158	150	30	0.063	0.045	2600	△		
2SK3214	200	10	0.19	0.17	1100	△		
2SK3215	200	8	0.55	0.40	410	△		
2SK3228	80	75	0.012	0.0075	9800	○		
2SK3418	60	85	0.009	0.0055	9770	△		
H7N0203AB	20	90	0.0051	0.003	6800	○		
H7N0307AB	30	60	0.0115	0.0058	2500	△		
H7N0308AB	30	70	0.0085	0.0048	3350	△		
H7N0312AB	30	85	0.0058	0.0033	6900	△		



# POWER MOS FET

## General Switching

Package code	Type No.	Ratings		Characteristics			Status	
		V <sub>DSS</sub> (V)	I <sub>D</sub> (A)	R <sub>DS(ON)</sub> (Ω) max		C <sub>iss</sub> (pF) typ		
				4 V (4.5 V)	10 V (2.5 V)			
TO-3P	H5N3008P▲	300	40	—	0.069	5150	△	
	H5N5007P	500	25	—	0.225	3900	○	
	H5N6001P	600	20	—	0.38	4640	○	
TO-3P FM	2SJ216	-60	-35	0.09	0.06	2400	○	
	2SJ218	-60	-45	0.06	0.042	3800	○	
	2SK1298	60	40	0.025	0.018	3600	○	
	2SK1328	450	12	—	0.55	1450	○	
	2SK1329	500	12	—	0.6	1450	○	
	2SK1405▲	600	15	—	0.5	2660	○	
	2SK1666	60	45	0.035	0.02	3950	△	
	2SK1670▲	250	30	—	0.095	3100	○	
	2SK1775	900	8.0	—	1.6	1730	○	
	2SK1832	500	10	—	0.9	1050	○	
	2SK1859	900	6.0	—	3	980	○	
	2SK2008▲	250	20	—	0.15	2350	○	
	2SK2203	60	50	0.013	0.01	8330	○	
	2SK2225	1500	2.0	—	12	990	○	
	H5N2301PF	230	25	—	0.085	2300	○	
	H5N2509PF	250	30	—	0.069	3600	△	
	TO-3PL	2SK1519▲	450	30	—	0.15	5800	○
		2SK1520▲	500	30	—	0.16	5800	○
		2SK1521▲	450	50	—	0.1	8700	○
		2SK1522▲	500	50	—	0.11	8700	○
		2SK1526	450	40	—	0.15	5800	○
		2SK1527	500	40	—	0.16	5800	○
		2SK1628	450	30	—	0.25	2800	○
		2SK1629	500	30	—	0.27	2800	○
		2SK1836	450	50	—	0.1	8150	○
		2SK1837	500	50	—	0.11	8150	○
2SK1947▲		250	50	—	0.06	5810	○	
2SK1948		250	50	—	0.06	5830	○	
2SK1971		500	35	—	0.23	8800	○	
2SK2393		1500	8	—	2.8	4370	○	
H5N5004PL▲		500	50	—	0.11	7630	△	
H5N5011PL		500	50	—	0.115	7700	△	
FP-8DA (JEDEC SOP-8)		HAT1016R(D)	-30	-4.5	0.18	0.09	660	○
		HAT1020R	-30	-5	0.13	0.07	860	○
		HAT1021R▼	-20	-5.5	0.06	(0.085)	1200	○
		HAT1023R▼	-20	-7	0.04	(0.06)	2250	○
	HAT1024R(D)	-30	-3.5	0.34	0.16	350	○	
	HAT1025R▼(D)	-20	-4.5	0.095	(0.15)	860	○	
	HAT1026R	-30	-7	0.065	0.037	1700	○	
	HAT1029R▼(D)	-20	-3.5	0.14	(0.23)	465	△	
	HAT1036R	-30	-12	0.034	0.014	4200	○	
	HAT1038R/RJ(D)	-60	-3.5	0.23	0.15	600	○	
	HAT1048R	-30	-16	(0.0135)	0.007	5700	○	
	HAT1054R▼(D)	-20	-6	(0.03)	(0.05)	1550	○	
	HAT2016R(D)	30	6.5	0.08	0.045	560	○	
	HAT2019R▼	30	8	0.027	(0.037)	920	※	
	HAT2020R	30	8	0.05	0.028	780	※	
	HAT2022R	30	11	0.025	0.015	1450	○	
	HAT2024R(D)	30	5.5	0.11	0.065	310	○	
	HAT2025R	30	8	(0.05)	0.026	660	○	
	HAT2026R▼	20	11	0.015	(0.021)	1760	○	
	HAT2027R▼(D)	20	7	0.038	(0.053)	720	○	
	HAT2028R/RJ(D)	60	4	0.16	0.10	280	○	
	HAT2029R▼(D)	28	7.5	0.033	(0.043)	780	○	
	HAT2033R/RJ	60	7	0.053	0.038	740	○	
	HAT2036R	30	12	(0.03)	0.015	1200	○	
	HAT2038R/RJ(D)	60	5	0.058	0.084	520	○	
	HAT2040R	30	15	0.013	0.008	4400	○	
	HAT2043R(D)	30	8	0.029	0.022	1170	○	
	HAT2044R▼	30	15	(0.009)	(0.013)	3420	△	
	HAT2058R(D)	100	4	0.18	0.145	420	○	
	HAT2064R	30	16	(0.01)	0.0063	2200	○	
	HAT2068R	30	14	(0.016)	0.009	1650	○	
	HAT2070R	30	12	(0.022)	0.014	1400	○	
	HAT2071R	30	10	(0.036)	0.020	740	○	
	HAT2077R	200	3	—	0.235	830	○	
	HAT2080R	250	1.7	—	0.85	300	○	
	HAT2085R	200	2	—	0.64	300	○	
	HAT2087R	250	2.5	—	0.31	830	○	
	HAT2088R	200	2	—	0.44	450	○	

		Ratings		Characteristics				
		V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (Ω) max		C <sub>iss</sub>		
				4 V (4.5 V)	10 V (2.5 V)			
FP-8DA	HAT2089R	250	2	—	0.6	450	○	
	HAT2092R(D)	30	11	(0.025)	0.016	1400	△	
	HAT2093R(D)	30	9	(0.039)	0.023	750	○	
	HAT2095R	150	2.5	—	0.42	300	SPL	
	HAT2103R(D)	30	4.5	(0.13)	0.065	220	○	
	HAT2108R(D)	28	11	0.015	(0.022)	2200	○	
	HAT3004R (Nch/Pch)	30/-3	5.5/-3.5	0.11/0.34	0.065/0.16	310/350	○	
	HAT3006R (Nch/Pch)	30/-3	6.5/-4.5	0.08/0.18	0.045/0.09	560/660	○	
	HAT3008R/RJ (Nch/Pch)	60/-6	5/-3.5	0.084/0.23	0.058/0.15	520/600	○	
	HAT3010R (Nch/Pch)	60	6/-5	0.045/0.13	0.032/0.076	1050/1350	○	
	TTP-8D (TSSOP-8)	HAT1031T▼(D)	-20	-2.5	0.16	(0.28)	390	○
		HAT1033T▼	-20	-3.5	0.063	(0.09)	970	○
		HAT1041T▼	-20	-6	0.026	(0.045)	1850	○
		HAT2031T▼(D)	20	3.5	0.07	(0.098)	300	△
HAT2037T▼		28	5.5	0.028	(0.038)	780	○	
HAT2042T▼(D)		28	5	0.034	(0.044)	510	○	
HAT2045T▼(D)		28	6	0.026	(0.037)	650	○	
HAT2050T(D)		100	1	1	0.75	90	○	
HAT2051T▼(D)		30	1	0.2	(0.3)	155	○	
HAT2052T▼(D)		28	5	0.034	(0.044)	510	○	
TSOP-6	HAT2080T	250	1.2	—	0.85	300	○	
	HAT2085T	200	1.4	—	0.64	300	○	
	HAT1043M▼	-20	-4.4	(0.065)	(0.110)	750	○	
	HAT1044M	-30	-4.5	(0.105)	0.060	600	○	
	HAT1053M▼	-20	-5.5	(0.048)	(0.074)	1240	※	
	HAT2053M▼	20	6.1	(0.033)	(0.048)	570	○	
LFPACK	HAT2054M	30	6.3	(0.052)	0.031	620	○	
	HAT1072H	-30	-40	(0.0077)	0.0045	9100	○	
	HAT2096H	30	40	(0.0088)	0.0053	2200	○	
	HAT2099H	30	50	(0.0073)	0.0037	4750	○	
	HAT2116H	30	35	(0.015)	0.0077	1650	○	
	HAT2119H	250	5	—	0.63	450	○	
	HAT2129H	40	30	—	7.5	3300	△	
	HAT2134H	20	60	5.8	2.9	4500	△	
	HAT2137H	40	45	—	4.8	6200	△	
	HAT2139H	40	20	—	11.5	2000	△	
CMFPAK-6	HAT2140H	100	25	—	16	6350	△	
	HAT2141H	100	15	—	27.5	3200	△	
	HAT2142H	100	10	—	44	2000	△	
	HAT2143H	30	40	11.5	6.1	2450	○	
	HAT1058C▼	-20	-3	(0.074)	(0.126)	770	○	
	HAT1059C▼	-12	-3	(0.064)	(0.088)	500	○	
	HAT1068C▼	-20	-3	(0.065)	(0.096)	1010	SPL	
	HAT1069C▼	-12	-3	(0.059)	(0.077)	1310	SPL	

- 注) ○: 正在批量生产  
 SPL: 样品正在发货  
 △: 可以批量生产 (交货期为三个月)  
 ※: 限定品种  
 ★: 大量订货对象品种 (订货单位为“500个的整数倍”)  
 ▼: 2.5 V R<sub>DS(ON)</sub> (Ω)  
 ▲: 高速二极管内藏品  
 (D): 有双芯片  
 HAT系列的样品, 正在以 HATxxxxWS 型号发货。

# POWER MOS FET

## ■ General Amplification

Package code	Type No.	Ratings		Characteristics			Status
		V <sub>DSS</sub> (V <sub>DSSX</sub> ) (V)	I <sub>D</sub> (A)	lyfsl (S) typ	V <sub>DS(sat)</sub> (V <sub>DS(on)</sub> ) (V) max	Ciss (pF) typ	
TO-220 AB	2SJ76	(-140)	-0.5	0.035	-2	120	○
	2SJ77	(-160)	-0.5	0.035	-2	120	○
	2SJ78	(-180)	-0.5	0.035	-2	120	○
	2SJ79	(-200)	-0.5	0.035	-2	120	○
	2SK213	(140)	0.5	0.04	2	90	○
	2SK214	(160)	0.5	0.04	2	90	○
	2SK215	(180)	0.5	0.04	2	90	○
	2SK216	(200)	0.5	0.04	2	90	○
TO-3P	2SJ160	(-120)	-7	1.0	-12	900	○

	Type No.	Ratings		Characteristics			Status
		V <sub>DSS</sub> (V <sub>DSSX</sub> ) (V)	I <sub>D</sub> (A)	lyfsl (S) typ	V <sub>DS(sat)</sub> (V <sub>DS(on)</sub> ) (V) max	Ciss (pF) typ	
TO-3P	2SJ161	(-140)	-7	1.0	-12	900	○
	2SJ162	(-160)	-7	1.0	-12	900	○
	2SJ351	(-180)	-8	1.0	-12	800	○
	2SJ352	(-200)	-8	1.0	-12	800	○
	2SK1056	(120)	7	1.0	12	600	○
	2SK1057	(140)	7	1.0	12	600	○
	2SK1058	(160)	7	1.0	12	600	○
	2SK2220	(180)	8	1.0	12	600	○
	2SK2221	(200)	8	1.0	12	600	○

## ■ Array

Package code	Type No.	Ratings		Characteristics			Status	
		V <sub>DSS</sub> (V)	I <sub>D</sub> (A)	R <sub>DS(ON)</sub> (Ω) max		Ciss (pF) typ		
				4 V	10 V (2.5 V)			
SP-10	4AK15	60	8.0	0.095	0.07	860	○	
	4AK16	60	5.0	0.25	0.18	400	○	
	4AK17	60	10	0.065	0.045	1400	○	
	4AK18	60	2.5	0.53	0.38	240	○	
	4AK19	120	5.0	0.6	0.5	—	○	
	4AK20	100	5.0	0.35	0.25	525	○	
	4AK21	100	8.0	0.125	0.09	1300	○	
	4AK25	60	1.5	0.6	0.45	140	○	
	4AK27	60	5	0.2	0.15	390	※	
	4AM11 (Nch/Pch)	60/ -60	5.0/ -5.0	0.24/ 0.27	0.17/ 0.2	400/ 900	○	
	4AM12 (Nch/Pch)	60/ -60	8.0/ -8.0	0.11/ 0.18	0.075/ 0.09	860/ 1400	○	
	4AM13 (Nch/Pch)	60/ -60	3.0/ -3.0	0.5/ 0.55	0.35/ 0.4	240/ 425	○	
	SP-12	4AJ11	-60	8.0	0.17	0.13	1400	○
		4AK26	60	8.0	0.075	0.06	1400	○

	Type No.	Ratings		Characteristics			Status
				R <sub>DS(ON)</sub> (Ω) max			
				4 V	10 V (2.5 V)		
SP-12	4AM16 (Nch/Pch)	60/ -60	8.0/ -8.0	0.24/ 0.27	0.17/ 0.2	400/ 850	※
	6AM11 (Nch/Pch)	60/ -60	5.0/ -5.0	0.24/ 0.27	0.17/ 0.2	400/ 900	○
SP-12T	4AK23	100	5.0	0.25	0.25	400	※
	4AM14 (Nch/Pch)	60/ -60	8.0/ -8.0	0.24/ 0.27	0.17/ 0.2	400/ 900	○
	4AM15 (Nch/Pch)	200/ -200	4.0/ -4.0	—	0.5/ 0.7	600/ 800	○
	6AM12 (Nch/Pch)	60/ -60	7.0/ -7.0	0.24/ 0.27	0.17/ 0.2	400/ 900	○
	6AM13 (Nch/Pch)	60/ -60	10/ -10	0.11/ 0.18	0.075/ 0.12	860/ 1400	○
	6AM14 (Nch/Pch)	60/ -60	7.0/ -7.0	0.2/ 0.16	(0.5)/ (0.3)	500/ 1450	○
	6AM15 (Nch/Pch)	60/ -60	10/ -10	0.115/ 0.165	0.06/ 0.105	500/ 850	○

## ■ Thermal FET

Package code	Type No.	Ratings		Characteristics			Status
		V <sub>bss</sub> (V)	I <sub>D</sub> (A)	R <sub>DS(ON)</sub> (Ω) max		T <sub>sd</sub> (°C) typ	
				4 V (5 V)	10 V		
TO-220 AB	HAF1001	-60	-15	0.13	0.09	175	○
	HAF2001	60	20	0.065	0.043	175	○
TO-220 FM	HAF2002	60	20	0.065	0.043	175	○
	HAF2005	60	40	0.033	0.02	175	○
	HAF2008	60	20	0.065	0.044	175	SPL
LDBPAK	HAF1002(L)/(S)	-60	-15	0.13	0.09	175	○
	HAF1009(L)/(S)	-60	-40	0.045	0.027	175	SPL

	Type No.	Ratings		Characteristics			Status
				R <sub>DS(ON)</sub> (Ω) max			
				4 V (5 V)	10 V		
LDBPAK	HAF2011(L)/(S)	60	40	0.033	0.02	175	○
	HAF2012(L)/(S)	60	20	0.065	0.043	175	○
	HAF2017(L)/(S)	60	20	0.065	0.043	175	SPL
	HAF2021(L)/(S)	60	50	0.015	0.012	175	○
DPAK	HAF1004(L)/(S)	-60	-5	0.34	0.2	175	SPL
	HAF2007(L)/(S)	60	5	0.12	0.075	175	○
SOP-8	HAF2015RJ	60	2	(0.2)	0.16	175	SPL

# IGBT

## ■ General Switching

Package code	Type No.	Ratings		Characteristics		Status
		V <sub>CE(s)</sub> (V)	I <sub>C</sub> (A)	V <sub>CE(sat)</sub> (V) typ	t <sub>r</sub> (μs) typ	
TO-220 AB	2SH11	600	10	2.6	0.3	※
	2SH12	600	15	2.6	0.3	※
	2SH13	600	20	2.6	0.3	※
	2SH17	600	12	2.0	2.0	※
	2SH18	600	18	2.0	2.0	※
	2SH19	600	24	2.0	2.0	※
	2SH26	600	10	2.1	0.3	△
	2SH27	600	15	2.1	0.3	△
	2SH28	600	20	2.1	0.3	△
	2SH29	600	30	2.1	0.3	△

	Type No.	Ratings		Characteristics		Status
		V <sub>CE(s)</sub> (V)	I <sub>C</sub> (A)	V <sub>CE(sat)</sub> (V) typ	t <sub>r</sub> (μs) typ	
LDBPAK	GN2550V4 LD/LS	250	50	1.6	0.12	SPL
	GN6020V4 LD/LS	600	20	2.1	0.1	○
	GN6030V4 LD/LS	600	30	2.1	0.1	○
TO-3P	2SH14	600	30	2.6	0.3	△
	2SH15	600	50	2.6	0.3	△
	2SH20	600	36	2.0	2.0	△
	2SH21	600	50	2.0	2.0	※
	2SH30	600	50	2.1	0.3	△
	2SH31	600	75	2.1	0.3	△
	2SH32	600	75	2.1	0.3	△
TO-3PL	2SH16	600	75	2.6	0.3	○
	2SH22	600	75	2.0	2.0	※

# RF POWER MODULE

## ■ High Frequency Amplification

Part No.	Package	Main Characteristics				Status
		f (MHz)	Pin (dBm)	Pout Min (dBm)	VDD (V)	
PF01410A	RF-K1	890~915	8	34.5	4.8	※
PF01411A	RF-K	880~915	0	35.8	4.8	※
PF01411B	RF-K-4	880~915	0	35.5	3.5	※
PF01412A	RF-K	890~915	0	35.8	5.5	※
PF04115B	RF-K2	1850~1910	0	32.5	3.5	※
PF0414A	RF-K	1710~1785	3	32.5	4.8	※
PF0414B	RF-K-4	1710~1785	0	32.5	3.5	※
PF08103A	RF-O	880~915 1710~1785	4.5	34.5 31.5	4.8	○
PF08103B	RF-O	880~915 1710~1785	1 4.5	35 32.5	3.5	○
PF08107B	RF-K-8	880~915 1710~1785	0	35 32	3.5	○
PF08107BP	RF-K-8	880~915 1710~1785	0	35 32.5	3.5	○
PF08109B	RF-O-12	880~915 1710~1785	0	35.5 32.7	3.5	○
PF08114B	RF-K1-10	880~915 1710~1785	10	34.5 31.5	3.5	○
PF08122B	RF-K-8	880~915 1710~1785	0	35 32.5	3.5	○
PF08123B	RF-K-8	880~915 1710~1785 1850~1910	0	35 32.5 32	3.5	○

注) ○: 正在批量生产  
 SPL: 样品正在发货  
 △: 可以批量生产 (交货期为三个月)  
 ※: 限定品种

# STANDARD TAPING SPECIFICATIONS

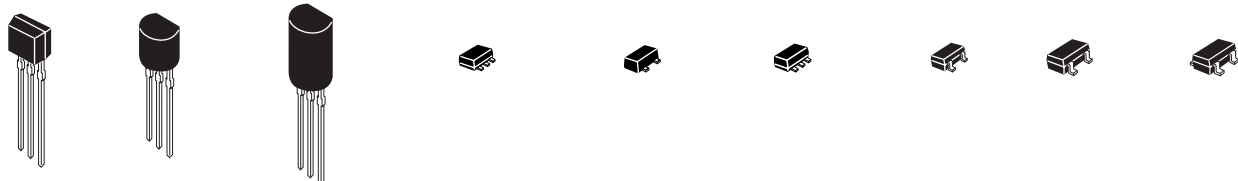
## ■ Packing Unit

Package code	Name Note)	Packing Unit	Package code	Name Note)	Packing Unit
TO-92	型号+等级+TZ	2500 Pcs/Box	TSSOP-14	型号+EL	1000 Pcs/Reel
TO-92 MOD	Type No.+Grade+TZ		(High frequency linear IC)	Type No.+EL	
SPAK			FP-8DA	型号+EL	2500 Pcs/Reel
MPAK	型号+标志+TL/TR	3000 Pcs/Reel	(JEDEC,SOP-8)	Type No.+EL	
MPAK-4	Type No.+Marking+TL/TR		LFPK	型号+EL	2500 Pcs/Reel
CMPAK				Type No.+EL	
CMPAK-4	型号+标志+UL/UR	12000 Pcs/Reel	TTP-8D	品名+EL	3000 Pcs/Reel
CMPAK-6	Type No.+Marking+UL/UR		(TSSOP-8)	Type No.+EL	
MPAK-5			DPAK S	型号+TL/TR	3000 Pcs/Reel
SMPAK				Type No.+TL/TR	
MFPK	型号+标志+TL/TR	9000 Pcs/Reel	LDPK S	品名+TL/TR	1000 Pcs/Reel
	Type No.+Marking+TL/TR			Type No.+TL/TR	
SMFPAK-6	型号+标志+TL/TR	5000 Pcs/Reel	UPAK	型号+标志+TL/TR	1000 Pcs/Reel
	Type No.+Marking+TL/TR			Type No.+Marking+TL/TR	
EMFPAK-6	型号+标志+TL/TR	5000 Pcs/Reel		型号+标志+UL/UR	4000 Pcs/Reel
	Type No.+Marking+TL/TR			Type No.+Marking+UL/UR	
MPAK-5	型号+标志+EL	3000 Pcs/Reel	RP-8P	型号+标志+TB	1000 Pcs/Reel
MPAK-6	Type No.+Marking+EL			Type No.+Marking+TB	
(High frequency linear IC)				型号+标志+UB	4000 Pcs/Reel
TSOP-6	型号+EL	3000 Pcs/Reel		Type No.+Marking+UB	
CMFPAK-6	Type No.+EL				

Note) Lead (Pb) free: + "-E"

# PACKAGE CODE

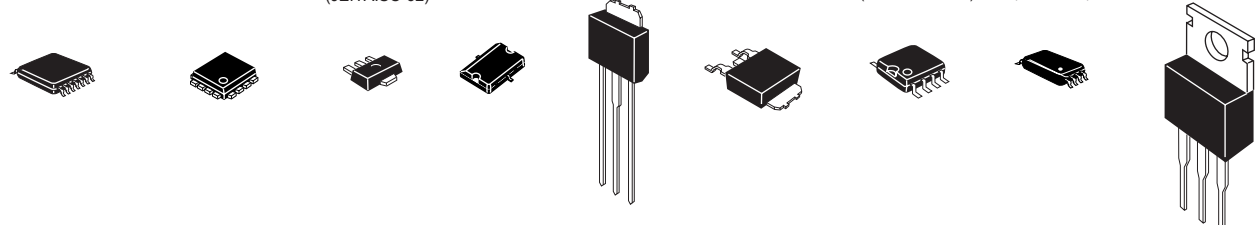
**SPAK** (JEITA:SC-72)   
 **TO-92** (JEITA:SC-43A)   
 **TO-92MOD** (JEITA:SC-51)   
 **EMFPAK-6**   
 **MFPAK** (1408扁平)   
 **SMFPAK-6**   
 **SMPAK** (JEITA:SC-75A)   
 **CMPAK** (JEITA:SC-70)   
 **CMPAK-4** (JEITA:SC-82AB)



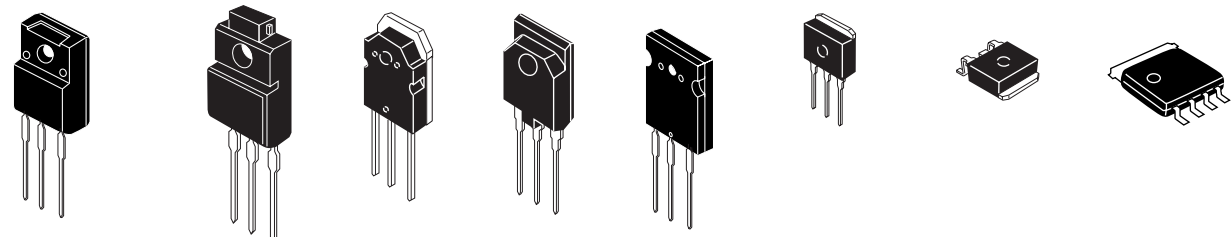
**CMFPAK-6**   
 **CMPAK-6**   
 **MPAK** (JEITA:SC-59A)   
 **MPAK-4** (JEITA:SC-61AA)   
 **MPAK-5**   
 **MPAK-6**   
 **TSOP-6**   
 **MSP-18**



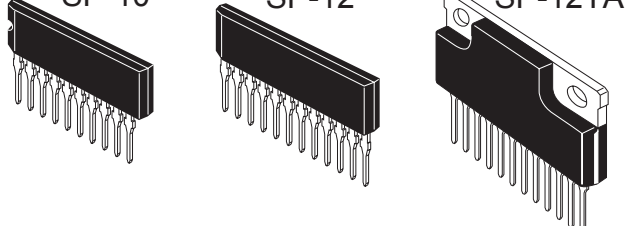
**TSSOP-14**   
 **TNP-16BV**   
 **UPAK** (JEITA:SC-62)   
 **RP8P**   
 **DPAK (L)**   
 **DPAK (S)**   
 **FP-8DA** (JEDEC SOP-8)   
 **TTP-8D** (TSSOP-8)   
 **TO-220AB**



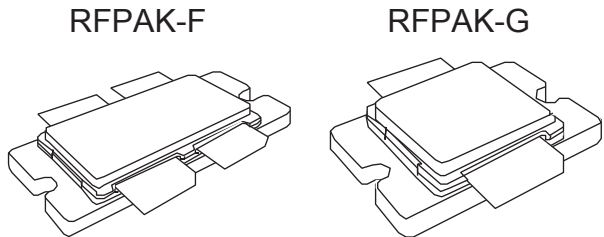
**TO-220C**   
**BFM**   
**TO-220FM**   
**TO-3P**   
**TO-3PFM**   
**TO-3PL**   
**LDBAK-(L)**   
**LDBAK-(S)**   
**LDBAK**



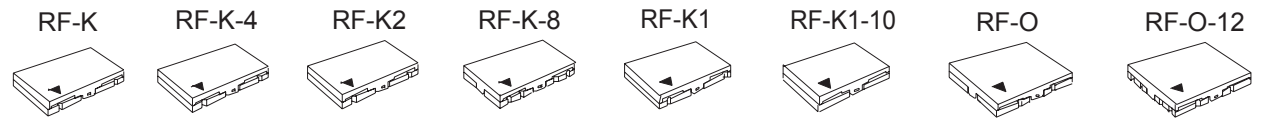
**TRANSISTOR ARRAY**  
**SP-10**    **SP-12**    **SP-12TA**



**RF POWER TRANSISTOR**



**RF POWER MODULE**



注) 上記外観図并非原寸大。



# SURFACE MOUNT TYPE MARKING

## ■MPAK

Type No.	Marking
2SA1052	MB, MC, MD
2SA1121	SB, SC, SD
2SA1122	CC, CD, CE
2SA1171	PD, PE
2SA1484	IRD, IRE
2SA1566	JID, JIE
2SA1617	VIB, VIC
2SB831	BB, BC
2SB1691	WL-
2SC2462	LB, LC, LD
2SC2463	DD, DE, DF
2SC2618	RB, RC, RD
2SC2619	FA, FB, FC
2SC2620	QB, QC
2SC2732	EC
2SC2734	GC
2SC2735	JC
2SC2736	TC
2SC2776	VA, VB, VC
2SC3127	ID-
2SC3513	IS-
2SC3793	IP-
2SC4050	KID, KIE
2SC4196	QI-
2SC4197	TI-
2SC4366	ZI-
2SC4591	XM-
2SC4680	XU-
2SC4702	XV-
2SC4964	YV-
2SC5049	YA-
2SC5050	YZ-
2SC5218	YK-
2SC5772	FR-
2SC5773	JR-
2SD1101	AB, AC
2SD1306	ND, NE
2SD2655	WM-
2SJ399	ZF-
2SJ451	ZK-
2SJ452	ZM-
2SJ486	ZU-
2SJ574	BP
2SJ575	AP
2SK217	ZC, ZD, ZE
2SK360	IGD, IGE, IGF
2SK1070	PIB, PIC, PID, PIE
2SK2373	ZE-
2SK2569	ZN-
2SK2570	ZL-
2SK2802	ZV-
2SK2980	ZZ-
2SK3000	ZY-
2SK3287	AN
2SK3288	EN
2SK3290	BN
BRA114EMP	EG
BRA123EMP	JG
BRA124EMP	CG
BRA143EMP	GG
BRA144EMP	AG
BRC114EMP	FG
BRC123EMP	KG
BRC124EMP	DG
BRC143EMP	HG
BRC144EMP	BG

## ■MPAK-4

Type No.	Marking
2SC3957	GIA, GIB
2SC4926	YD-
2SC5080	ZD-
2SC5545	ZS-
3SK295	ZQ-
3SK297	ZP-
3SK300	ZR-
3SK319	YB-
BB101M	AU-
BB102M	BU-
BB301M	AW-
BB302M	BW-
BB303M	CW-
BB304M	DW-
BB305M	EW-
BB501M	AS-
BB502M	BS-
BB503M	CS-
BB504M	DS-
BIC702M	BZ-
BIC703M	CZ-

## ■MPAK-5

Type No.	Marking
HA22022	GDA (A: 制造月编码可变)
HA22033	GEA (A: 制造月编码可变)

## ■MPAK-6

Type No.	Marking
HA22040	GH

## ■SMPAK

Type No.	Marking
2SC5137	YA-
2SC5139	YZ-
2SC5247	ZD-
2SC5629	XZ-
2SJ587	DP
2SK3349	DN
H5N0301SM	GN
H5P0301SM	GP

## ■UPAK

Type No.	Marking
2SB1001	BH, BJ
2SB1002	CH, CJ
2SB1025	DH, DJ, DK
2SB1026	DL, DM
2SB1028	EL, EM
2SB1048	BT
2SC3380	AS
2SC4807	ER
2SC4988	FR
2SC5631	JR
2SD1367	BA, BB, BC
2SD1368	CA, CB, CC
2SD1418	DA, DB, DC
2SD1419	DD, DE

## ■UPAK

Type No.	Marking
2SD1421	ED, EE
2SD1470	AT
2SD1472	CT
2SD1974	ES
2SJ186	CY
2SJ244	JY
2SJ278	MY
2SJ317	NY
2SJ361	RY
2SJ484	WY
2SJ517	YY
2SJ518	AZ
2SK1334	BY
2SK1579	DY
2SK1697	EY
2SK1698	FY
2SK1764	KY
2SK1772	HY
2SK2247	QY
2SK2315	TY
2SK2788	VY
2SK2978	ZY
2SK3391	JX

## ■RP8P

Type No.	Marking
2SK3390	IX

## ■CMPAK

Type No.	Marking
2SA2080	MB, MC, MD
2SA2081	CC, CD, CE
2SC4260	TI-
2SC4261	QI-
2SC4262	IP-
2SC4264	GC
2SC4265	JC
2SC4463	HC
2SC4537	IS-
2SC4593	XM-
2SC4784	YA-
2SC4899	YH-
2SC4901	YK-
2SC4965	YV-
2SC5051	YZ-
2SC5850	LB, LC, LD
2SC5851	FA, FB, FC
2SJ576	AP
2SJ586	CP
2SK1215	IGD, IGE, IGF
2SK3289	AN
2SK3348	CN
2SK3378	EN
BRA114ECM	EG
BRA123ECM	JG
BRA124ECM	CG
BRA143ECM	GG
BRA144ECM	AG
BRC114ECM	FG
BRC123ECM	KG
BRC124ECM	DG
BRC143ECM	HG
BRC144ECM	BG

## ■CMPAK-4

Type No.	Marking
2SC4995	YD-
2SC5081	ZD-
2SC5593	XH-
2SC5594	XP-
2SC5623	WH-
2SC5624	VH-
2SC5820	WU-
2SC5894	WY-
2SK2685	ZT-
3SK296	ZQ-
3SK298	ZP-
3SK309	XV-
3SK317	ZR-
3SK318	YB-
BB101C	AU-
BB102C	BU-
BB301C	AW-
BB302C	BW-
BB303C	CW-
BB304C	DW-
BB305C	EW-
BB501C	AS-
BB502C	BS-
BB503C	CS-
BB504C	DS-
BIC702C	BZ-
BIC703C	CZ-

## ■CMPAK-6

Type No.	Marking
HAT1066G	66
HAT2106G	06
HAT3016G	16
TBB1001	AM
TBB1002	BM
TBB1004	DM
TBB1005	EM

## ■MFPK

Type No.	Marking
2SC5543	YA-
2SC5544	YZ-
2SC5554	YH-
2SC5555	ZD-
2SC5628	XZ-
2SC5700	WB-
2SC5702	ZS-
2SC5757	WE-
2SC5758	WF-
2SC5812	WG-
H5N0201MF	DN
H5N0301MF	GN
H5P0201MF	DP
H5P0301MF	GP

## ■CMFPK-6

Type No.	Marking
HAT1058C	058
HAT1059C	059
HAT1068C	068
HAT1069C	069

## ■SMFPK-6

Type No.	Marking
HTT1115S	EK
HTT1213S	CK

## ■EMFPK-6

Type No.	Marking
HTT1115E	F
HTT1213E	E



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