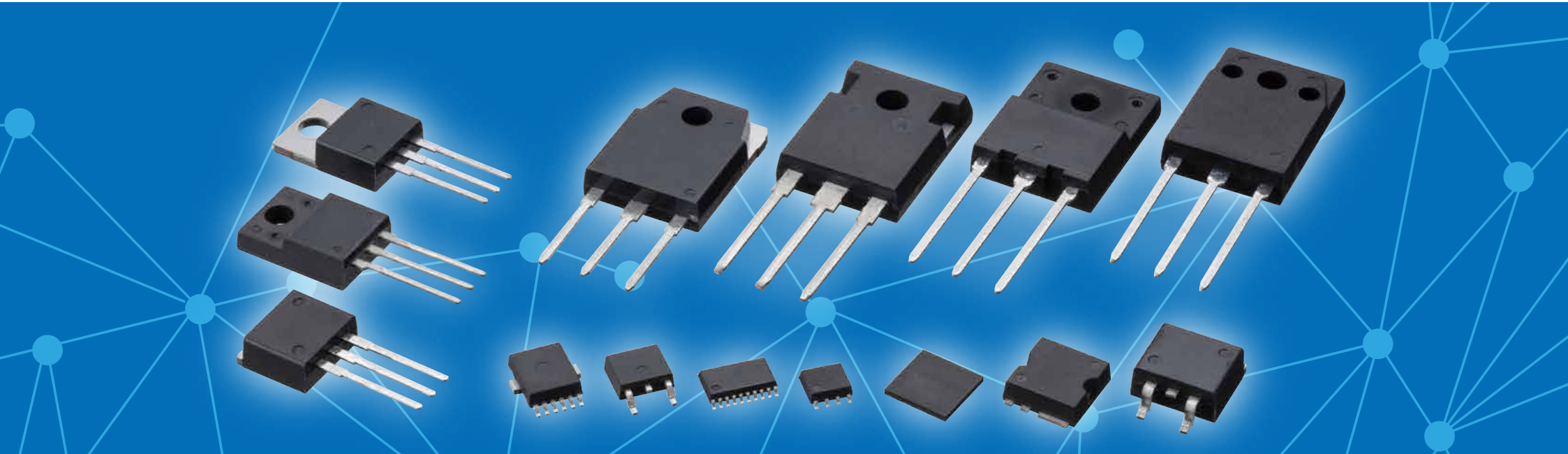
Fuji Electric

Innovating Energy Technology

FUJI Power Semiconductors

MOSFET Selection Guide



Super J MOS® S2/S1 Series	PAGE 6	Super J MOS® S2FD/S1FD Series	PAGE 7	SuperFAP-E^3 Series	PAGE 8
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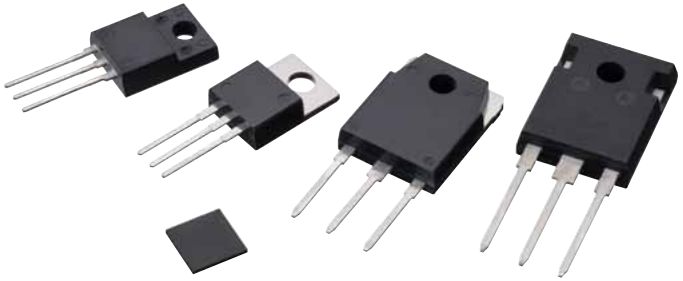
25A2-E-0006

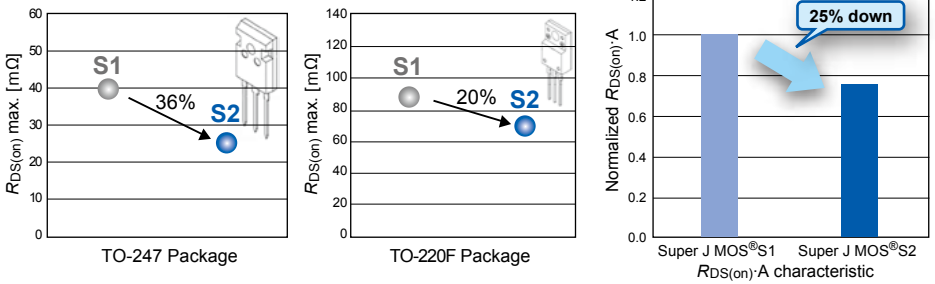
Super J MOS® S2 Series



■Features

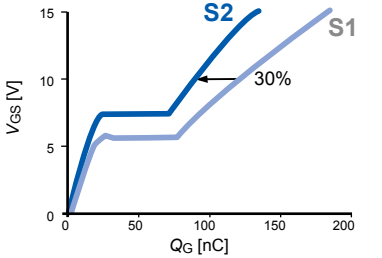
- Low $R_{DS(on)}$・A 25% lower than our conventional MOSFET (Super J MOS® S1)
- Due to low $R_{DS(on)}$, Selectable smaller package
  ex) 600V/0.07Ω/TO-3P → 600V/0.07Ω/TO-220F

Low $R_{DS(on)}$

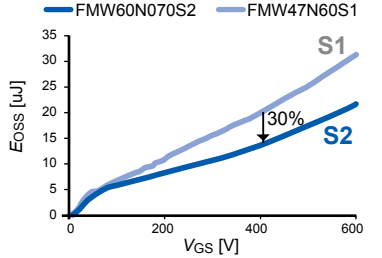


- Low Q_G 30% lower than our conventional MOSFET (Super J MOS® S1)
- Low E_{oss} 30% lower than our conventional MOSFET (Super J MOS® S1)

V_{GS} - Q_G



E_{OSS} - V_{DS}



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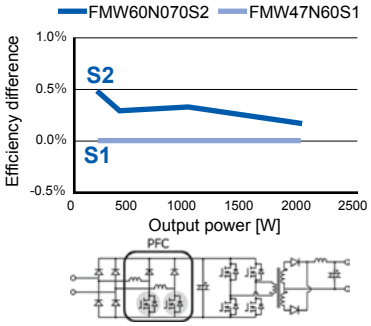
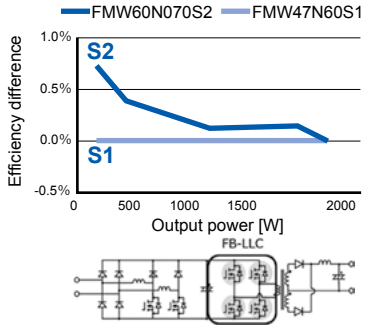
PFC stage Efficiency difference



Circuit: PFC+LLC(Exchanged PFC MOS)
Input: 230V AC 50Hz
Output: 53.5V/Iout=37A
External R_G: 2Ω
Sample: 600V/70mΩ max.

LLC stage Efficiency difference



Circuit: PFC+LLC(Exchanged LLC MOS)
Input: 230V AC 50Hz
Output: 49V/Iout=6.12~56.01A
External R_G: 5.1Ω
Sample: 600V/70mΩ max.

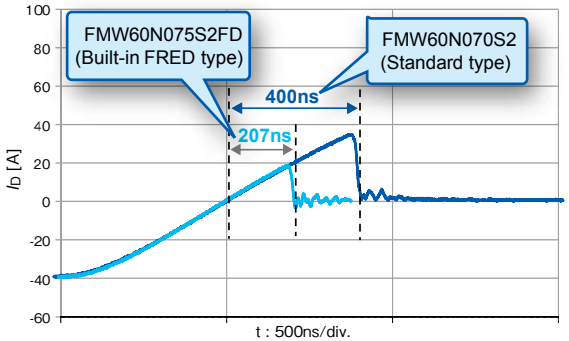
■Applications

PFC or PWM converter for Server, PC, PCS, UPS, LCD-TV, Lighting and Standard power supply

Super J MOS® S2FD Series (Built-in FRED type)

■Features

- t_{rr} of S2FD is 50% faster than S2
- High diode recovery ruggedness (High -di_{DR}/dt ruggedness)
- Guaranteed avalanche robustness

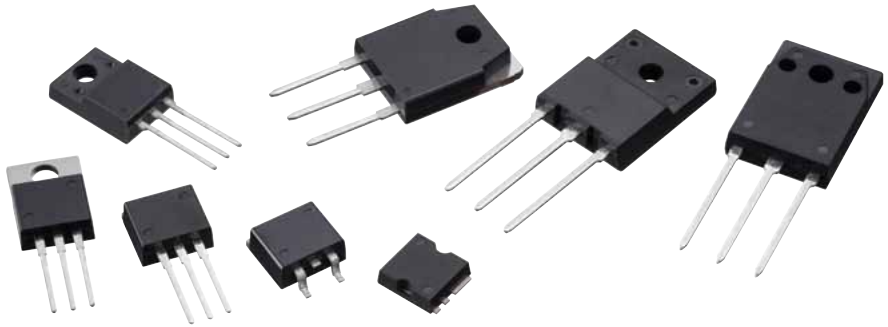


Conditions: V_{DD}=400V, I_{DR}=39.4A, -di_{DR}/dt =100A/us, T_{ch}=25°C
Built-in diode recovery wave form

■Applications

For resonant switching topologies in applications like UPS, Server,Telecom, LED lighting, Power conditioner system and Power supply.

SuperFAP-E^3, E^{3S} Series



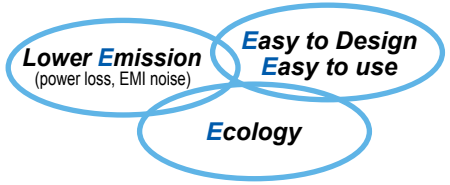
■Concept

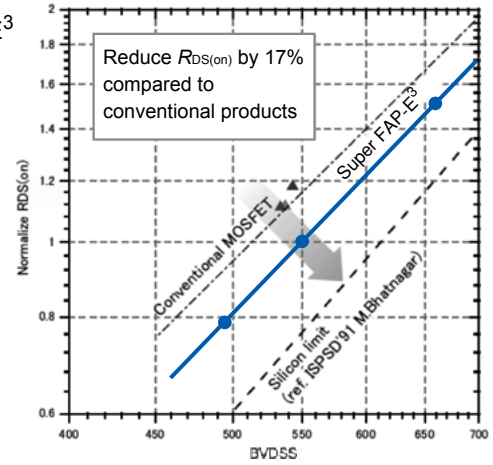
The second generation Quasi-Planer Junction technology copes with both low loss/noise and usability.
And this technology lets us achive high performance for power supply's circuit design.

■Features

- Coping with both low loss and low noise
- Low $R_{DS(on)}$
- High controllability of gate resistance during switching
- Low V_{GS} ringing waveform during switching
- Narrow band of the gate threshold voltage (3.0±0.5V)
- High avalanche durability
- SuperFAP-E^{3S} is Low Q_g type of SuperFAP-E^3

Concept





SuperFAP-G Series

The Quasi-Planer Junction technology achieve low $R_{DS(on)}$ and low switching loss (low Q_{GD}).

■Features

- Low turn off loss 75% lower than our conventional type
- Low Gate charge 60% lower than our conventional type
- High avalanche durability
- Due to low RDS(on), Selectable smaller package
  ex） 500V/0.4Ω/TO-3P → 500V/0.38Ω/TO-220

No.	Products Category	Page	Built-in FRED type	V_{DSS}					Rated Current				
				≤80V	>80V ≤250V	>250V ≤500V	>500V ≤650V	>650V ≤900V	≤5A	>5A ≤10A	>10A ≤30A	>30A ≤50A	>50A ≤100A
1	Super J MOS® S2/S1 Series	6					✓			✓	✓	✓	✓
2	Super J MOS® S2FD/S1FD Series	7	✓				✓				✓	✓	✓
3	SuperFAP-E^3 Series	8				✓	✓	✓	✓	✓	✓		
4	SuperFAP-E^{3S} Low Qg Series	9				✓	✓			✓	✓		
5	SuperFAP-G Series	10			✓	✓	✓	✓	✓	✓	✓	✓	✓
6	SuperFAP-G Built-in FRED Series	12	✓			✓	✓				✓	✓	
7	Trench Power MOSFET Series	12		✓	✓							✓	✓
8	Automotive Super J MOS® S2/S1 Series	13					✓				✓	✓	✓
9	Automotive Super J MOS® S2FD/S1FD Series	14	✓			✓	✓				✓	✓	✓
10	Automotive Trench Power MOS, SuperFAP-E^{3S} Series	15	✓	✓	✓	✓	✓				✓	✓	✓
11	Automotive IPS Series (Intelligent Power Switches)	16		✓					✓	✓	✓	✓	✓

■ Part numbers

FMV20N60S1 (example)：excluding the Super J MOS® S2/S2FD Series

F	M		V		20	N		60	S1	
CompanySymbol	Device code		Package code		Current	Polarity		Voltage	Series	
Fuji	M	MOSFET	A	TO-220F	×1	N	N-ch	×1/10	S1	Super J MOS®
			C	T-Pack (S)					S1FD	Super J MOS® (FRED)
			H	TO-3P					S1A	Super J MOS® for Automotive
			I	T-Pack (L)					S1FDA	Super J MOS® (FRED) for Automotive
			L	TFP					E	SuperFAP-E^3
			P	TO-220					ES	SuperFAP-E^{3S}
			R	TO-3PF					ESF	SuperFAP-E^{3S}(FRED)
			V	TO-220F (SLS)					G	SuperFAP-G
			W	TO-247-P2					GF	SuperFAP-G (FRED)
			Y	TO-247					T2	Trench
									R6	3G-Trench

FMV60N190S2 (example)：Super J MOS® S2/S2FD Series

F	M		V		60	N		190	S2	
Company Symbol	Device code		Package code		Voltage	Polarity		Ron (mΩ)	Series	
Fuji	M	MOSFET	H	TO-3P	×1/10	N	N-ch	×1	S2	Super J MOS®
			L	DFN8x8					S2FD	Super J MOS® (FRED)
			P	TO-220					S2A	Super J MOS® for Automotive
			V	TO-220F (SLS)					S2FDA	Super J MOS® (FRED) for Automotive
			W	TO-247-P2						
			Y	TO-247						

Product Map

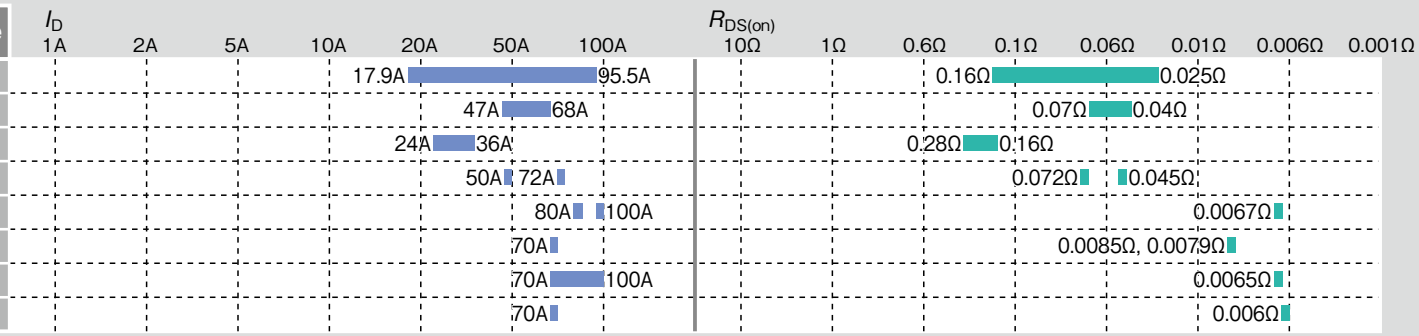
	V_{DSS}	Products Category	Page	I_D	$R_{DS(on)}$
1	900V	SuperFAP-E³ Series	8	6A 11A	2.5Ω 1Ω
2		SuperFAP-G Series	11	2.2A 6A	8Ω 2.5Ω
3	800V	SuperFAP-E³ Series	8	6A 13A	2Ω 0.78Ω
4	700V	SuperFAP-E³ Series	8	7A 15A	1.5Ω 0.59Ω
5		SuperFAP-G Series	11	17A	0.6Ω
6	650V	SuperFAP-E³ Series	8	7A 9A	1.47Ω 0.97Ω
7	600V	Super J MOS® S2 Series	6	10A 95.5A	0.38Ω 0.0254Ω
8		Super J MOS® S1 Series	6	6.5A 68A	0.58Ω 0.04Ω
9		SuperFAP-E³, E³S Series	8,9	3A 23A	2.3Ω 0.28Ω
10		SuperFAP-G Series	11	3A 21A	3.3Ω 0.37Ω
11	500V	SuperFAP-E³, E³S Series	8,9	5A 28A	1.5Ω 0.19Ω
12		SuperFAP-G Series	11	4A 51A	2.3Ω 0.11Ω
13	450V	SuperFAP-G Series	10	3A 17A	2.5Ω 0.38Ω
14	300V	SuperFAP-G Series	10	15A 32A	0.28Ω 0.13Ω
15	250V	SuperFAP-G Series	10	14A 59A	0.26Ω 0.053Ω
16	200V	SuperFAP-G Series	10	18A 45A	0.17Ω 0.066Ω
17		Trench Power MOSFET Series	12	49A	0.047Ω
18	150V	SuperFAP-G Series	10	23A 100A	0.105Ω 0.016Ω
19		Trench Power MOSFET Series	12	65A	0.0245Ω
20	120V	SuperFAP-G Series	10	67A	0.03Ω
21	100V	SuperFAP-G Series	10	29A	0.062Ω
22		Trench Power MOSFET Series	12	80A 100A	0.0128Ω 0.0067Ω
23	75V	Trench Power MOSFET Series	12	70A	0.0085Ω, 0.0079Ω
24	60V	Trench Power MOSFET Series	12	70A 100A	0.0065Ω
25	40V	Trench Power MOSFET Series	12	70A	0.06Ω

Built-in FRED Type

				I_D	$R_{DS(on)}$
1	600V	Super J MOS® S2FD Series	7	22.7A 95.5A	0.191Ω 0.027Ω
2		Super J MOS® S1FD Series	7	20A 68A	0.2Ω 0.042Ω
3		SuperFAP-G Series	12	11A 42A	0.8Ω 0.17Ω
4	500V	SuperFAP-G Series	12	13A	0.55Ω

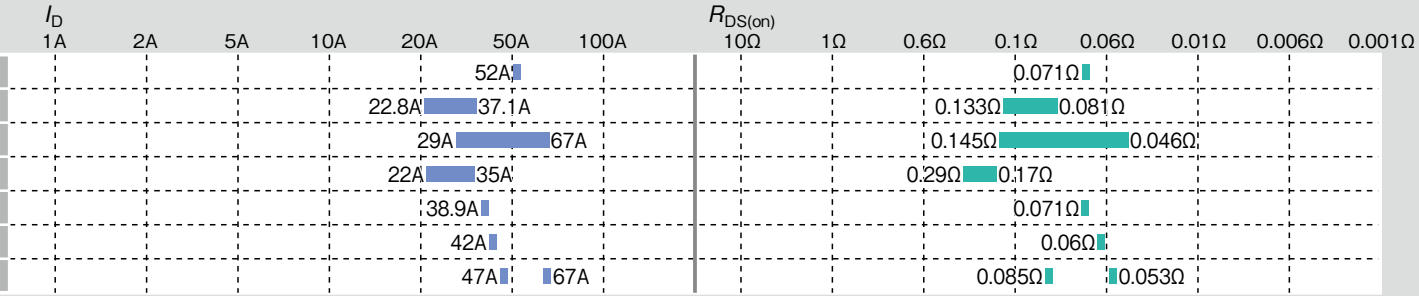
Product Map (Automotive)

	V_{DSS}	Products Category	Page
1	600V	Automotive Super J MOS® S2 Series	13
2		Automotive Super J MOS® S1 Series	13
3		Automotive SuperFAP-E^{3S} Low Qg Series	15
4	300V	Automotive SuperFAP-E^{3S} Low Qg Series	15
5	100V	Automotive Trench MOSFET	15
6	75V	Automotive Trench MOSFET	15
7	60V	Automotive Trench MOSFET	15
8	40V	Automotive Trench MOSFET	15



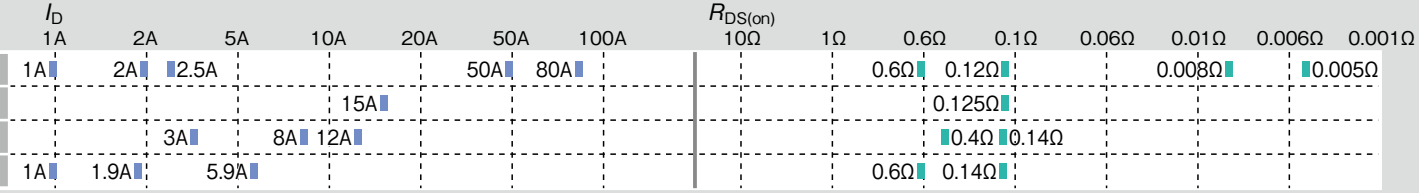
Built-in FRED Type

1	650V	Automotive Super J MOS® S1FD Series	14
2	600V	Automotive Super J MOS® S2FD Series	14
3		Automotive Super J MOS® S1FD Series	14
4		Automotive SuperFAP-E^{3S} Low Qg Series	15
5	500V	Automotive Super J MOS® S2FD Series	14
6	400V	Automotive Super J MOS® S2FD Series	14
7	300V	Automotive SuperFAP-E^{3S} Low Qg Series	15



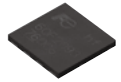
IPS (Intelligent Power Switches)

1	33V,35V	Automotive IPS Series (High Side 1ch)	16
2	80V	Automotive IPS Series (Low Side 1ch)	16
3	40V	Automotive IPS Series (Low Side 1ch)	16
4	40V	Automotive IPS Series (Low Side 2ch)	16



■ Super J MOS® S2/S1 Series

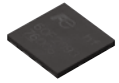
Low-on resistance, low switching noise and low switching loss

Super J MOS® S2/S1 Series				TO-220		TO-220F (SLS)		TO-3P(Q)		TO-247-P2		DFN8×8
												
V_{DS} (V)	$R_{DS(on)}$ max. (mΩ)	I_D (A)										
		S2 Series	S1 Series	S2 Series	S1 Series	S2 Series	S1 Series	S2 Series	S1 Series	S2 Series	S1 Series	S2 Series
600	580	-	6.5		FMP07N60S1		FMV07N60S1					
	470	-	8		FMP08N60S1		FMV08N60S1					
	380	10.0	10	FMP60N380S2	FMP10N60S1	FMV60N380S2	FMV10N60S1					
	280	13.0	13	FMP60N280S2	FMP13N60S1	FMV60N280S2	FMV13N60S1	FMH60N280S2	FMH13N60S1			
	230	-	15		FMP15N60S1		FMV15N60S1		FMH15N60S1		FMW15N60S1	
	223	19.2	-									FML60N223S2
	190	20.0	20	FMP60N190S2	FMP20N60S1	FMV60N190S2	FMV20N60S1	FMH60N190S2	FMH20N60S1	FMW60N190S2	FMW20N60S1	
	187	22.7	-									FML60N187S2
	160	23.9	22	FMP60N160S2	FMP22N60S1	FMV60N160S2	FMV22N60S1		FMH22N60S1	FMW60N160S2	FMW22N60S1	
	146	28.7	-									FML60N146S2
	125	30.1	30	FMP60N125S2	FMP30N60S1	FMV60N125S2	FMV30N60S1		FMH30N60S1	FMW60N125S2	FMW30N60S1	
	115	37.1	-									FML60N115S2
	103	41.3	-									FML60N103S2
	99	38.1	35	FMP60N099S2		FMV60N099S2	FMV35N60S1		FMH35N60S1	FMW60N099S2	FMW35N60S1	
	91	42.3	-									FML60N091S2
	88	42.3	40	FMP60N088S2		FMV60N088S2	FMV40N60S1		FMH40N60S1	FMW60N088S2	FMW40N60S1	
	79	47.9	-	FMP60N079S2		FMV60N079S2				FMW60N079S2		
	70	53.2	47			FMV60N070S2			FMH47N60S1	FMW60N070S2	FMW47N60S1	
	55	64.4	57							FMW60N055S2	FMW57N60S1	
	40	77.5	68							FMW60N040S2	FMW79N60S1	
	25.4	95.5	-							FMW60N025S2		

The Super J MOS® series products satisfies the quality assurance level of general consumer use.
If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric.
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

■ Super J MOS® S2FD/S1FD Sereis　Built-in FRED Series

Low-on resistance, low switching noise and low switching loss

Super J MOS® S2FD/S1FD Series (Built-in FRED type)				TO-220		TO-220F (SLS)		TO-3P(Q)	TO-247-P2		DFN8×8
											
V_{DS} (V)	$R_{DS(on)}$ max. (mΩ)	I_D (A)									
		S2FD Series	S1FD Series	S2FD Series	S1FD Series	S2FD Series	S1FD Series	S1FD Series	S2FD Series	S1FD Series	S2FD Series
600	200	20	20		FMP20N60S1FD		FMV20N60S1FD	FMH20N60S1FD		FMW20N60S1FD	
	191	22.7	-								FML60N191S2FD
	170	23.9	22	FMP60N170S2FD	FMP22N60S1FD	FMV60N170S2FD	FMV22N60S1FD	FMH22N60S1FD	FMW60N170S2FD	FMW22N60S1FD	
	150	28.7	-								FML60N150S2FD
	133(S2), 132(S1)	30.1	30	FMP60N133S2FD	FMP30N60S1FD	FMV60N133S2FD	FMV30N60S1FD	FMH30N60S1FD	FMW60N133S2FD	FMW30N60S1FD	
	118	37.1	-								FML60N118S2FD
	105	38.1	35	FMP60N105S2FD		FMV60N105S2FD	FMV35N60S1FD	FMH35N60S1FD	FMW60N105S2FD	FMW35N60S1FD	
	104	41.3	-								FML60N104S2FD
	94	42.3	-	FMP60N094S2FD		FMV60N094S2FD			FMW60N094S2FD		
	93	42.3	40					FMH40N60S1FD		FMW40N60S1FD	FML60N093S2FD
	84	47.9	-	FMP60N084S2FD		FMV60N084S2FD			FMW60N084S2FD		
	75(S2), 74(S1)	53.2	47			FMV60N075S2FD		FMH47N60S1FD	FMW60N075S2FD	FMW47N60S1FD	
	59(S2), 58(S1)	64.4	57						FMW60N059S2FD	FMW57N60S1FD	
	43(S2), 42(S1)	77.5	68						FMW60N043S2FD	FMW79N60S1FD	
	27	95.5	-						FMW60N027S2FD		

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■ SuperFAP-E^3 Series

Low-on resistance and low switching noise

SuperFAP-E^3 Series			TO-220	TO-220F (SLS)	TO-3P(Q)	TO-3PF	T-Pack(L)	T-Pack(S)
								
V_{DS} (V)	$R_{DS(on)}$ max.(Ω)	I_D (A)						
500	1.5	5	FMP05N50E	FMV05N50E			FMI05N50E	FMC05N50E
	0.85	6.5	FMP07N50E	FMV07N50E			FMI07N50E	FMC07N50E
	0.79	7.5	FMP08N50E	FMV08N50E				
	0.52	12	FMP12N50E	FMV12N50E			FMI12N50E	FMC12N50E
	0.38	16	FMP16N50E	FMV16N50E	FMH16N50E		FMI16N50E	FMC16N50E
	0.31	20	FMP20N50E	FMV20N50E	FMH20N50E		FMI20N50E	FMC20N50E
	0.245	23		FMV23N50E	FMH23N50E	FMR23N50E		
	0.19	28			FMH28N50E	FMR28N50E		
600	2.3	3	FMP03N60E	FMV03N60E			FMI03N60E	FMC03N60E
	1.3	5.5	FMP05N60E	FMV05N60E			FMI05N60E	FMC05N60E
	1.2	6	FMP06N60E	FMV06N60E				
	0.79	10	FMP10N60E	FMV10N60E			FMI10N60E	FMC10N60E
	0.75	11	FMP11N60E	FMV11N60E			FMI11N60E	FMC11N60E
	0.58	13	FMP13N60E	FMV13N60E			FMI13N60E	FMC13N60E
	0.47	16	FMP16N60E	FMV16N60E			FMI16N60E	FMC16N60E
	0.365	19		FMV19N60E	FMH19N60E	FMR19N60E		
	0.28	23			FMH23N60E	FMR23N60E		
650	1.47	7		FMV07N65E				
	0.97	9		FMV09N65E				
700	1.5	7		FMV07N70E	FMH07N70E			
	1.2	9		FMV09N70E	FMH09N70E			
	0.85	11		FMV11N70E	FMH11N70E			
	0.59	15		FMV15N70E				
800	2	6		FMV06N80E	FMH06N80E		FMI06N80E	FMC06N80E
	1.6	8		FMV08N80E	FMH08N80E		FMI08N80E	FMC08N80E
	1.1	10		FMV10N80E	FMH10N80E			
	0.78	13		FMV13N80E	FMH13N80E			
900	2.5	6		FMV06N90E	FMH06N90E		FMI06N90E	FMC06N90E
	2	7		FMV07N90E	FMH07N90E		FMI07N90E	FMC07N90E
	1.4	9		FMV09N90E	FMH09N90E	FMR09N90E		
	1	11		FMV11N90E	FMH11N90E	FMR11N90E		

Super FAP-E^3 series products satisfies the quality assurance level of general consumer use. If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric. Do not use the products for equipment requiring strict reliability such as aerospace equipment.

■ SuperFAP-E^{3S} Low Qg Series

Low-on resistance, low switching noise and low switching loss

SuperFAP-E^{3S} Low Qg Series			TO-220	TO-220F (SLS)	TO-3P(Q)	TO-3PF	T-Pack(L)	T-Pack(S)	TFP
									
V_{DS} (V)	$R_{DS(on)}$ max. (Ω)	I_D (A)							
500	0.5	12	FMP12N50ES	FMV12N50ES			FMI12N50ES	FMC12N50ES	FML12N50ES
	0.38	16	FMP16N50ES	FMV16N50ES	FMH16N50ES		FMI16N50ES	FMC16N50ES	FML16N50ES
	0.31	20	FMP20N50ES	FMV20N50ES	FMH20N50ES		FMI20N50ES	FMC20N50ES	FML20N50ES
	0.27	21		FMV21N50ES	FMH21N50ES	FMR21N50ES			
	0.245	23		FMV23N50ES	FMH23N50ES	FMR23N50ES			
	0.19	28			FMH28N50ES	FMR28N50ES			
600	1.2	6	FMP06N60ES	FMV06N60ES			FMI06N60ES	FMC06N60ES	
	0.75	12	FMP12N60ES	FMV12N60ES			FMI12N60ES	FMC12N60ES	FML12N60ES
	0.58	13	FMP13N60ES	FMV13N60ES	FMH13N60ES		FMI13N60ES	FMC13N60ES	FML13N60ES
	0.47	16	FMP16N60ES	FMV16N60ES	FMH16N60ES		FMI16N60ES	FMC16N60ES	FML16N60ES
	0.4	17		FMV17N60ES	FMH17N60ES	FMR17N60ES			
	0.365	19		FMV19N60ES	FMH19N60ES	FMR19N60ES			
	0.28	23			FMH23N60ES	FMR23N60ES			

Super FAP-E^3 series products satisfies the quality assurance level of general consumer use.
If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric.
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

■ SuperFAP-G Series

Low-on resistance and low gate charge

SuperFAP-G Series			TO-220	TO-220F	TO-220F (SLS)	TO-3PF	TO-247	T-Pack(L)	T-Pack(S)	TFP
										
V_{DS} (V)	$R_{DS(on)}$ max. (Ω)	I_D (A)								
100	0.062	29	2SK3598-01	2SK3599-01MR				2SK3600-01L	2SK3600-01S	
120	0.03	67	2SK3920-01	2SK3886-01MR				2SK3921-01L	2SK3921-01S	2SK3922-01
150	0.105	23	2SK3602-01	2SK3603-01MR				2SK3604-01L	2SK3604-01S	
	0.07	33	2SK3648-01	2SK3649-01MR 2SK3537-01MR *1				2SK3650-01L	2SK3650-01S	2SK3474-01
	0.041	57	2SK3590-01	2SK3591-01MR				2SK3592-01L	2SK3592-01S	2SK3593-01
	0.016	100					2SK3882-01			
200	0.17	18	2SK3606-01	2SK3607-01MR				2SK3608-01L	2SK3608-01S	2SK3609-01
	0.066	45	2SK3594-01	2SK3595-01MR				2SK3596-01L	2SK3596-01S	2SK3597-01
250	0.26	14	2SK3610-01	2SK3611-01MR				2SK3612-01L	2SK3612-01S	
	0.13	24			FMV24N25G					
	0.1	37	2SK3554-01	2SK3555-01MR		2SK3651-01R		2SK3556-01L	2SK3556-01S	2SK3535-01
	0.053	59				2SK3779-01R	2SK3778-01			
300	0.28	15		2SK3580-01MR						
	0.13	32	2SK3772-01	2SK3580-01MR				2SK3774-01L	2SK3774-01S	2SK3775-01
450	2.5	3	2SK3725-01	2SK3726-01MR						
	1.6	4	2SK3916-01	2SK3917-01MR						
	0.65	10	2SK3514-01	2SK3515-01MR				2SK3516-01L	2SK3516-01S	
	0.38	17	2SK3692-01	2SK3693-01MR				2SK3694-01L	2SK3694-01S	2SK4040-01

The Super FAP-G series products satisfies the quality assurance level of general consumer use.
If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric.
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

*1: $V_{GS(th)}$: Low voltage type

■ SuperFAP-G Series

Low-on resistance and low gate charge

SuperFAP-G Series			TO-220	TO-220F	TO-3PF	TO-247	T-Pack(L)	T-Pack(S)	TFP
									
V_{DS} (V)	$R_{DS(on)}$ max. (Ω)	I_D (A)							
500	2.3	4	2SK3985-01	2SK3986-01MR			2SK3987-01L	2SK3987-01S	
	0.85	9	2SK3519-01	2SK3520-01MR 2SK4004-01MR *1			2SK3521-01L	2SK3521-01S	
	0.7	11	2SK3931-01	2SK3932-01MR			2SK3933-01L	2SK3933-01S	
	0.52	14	2SK3468-01	2SK3469-01MR			2SK3512-01L	2SK3512-01S	
	0.46	16	2SK3504-01	2SK3505-01MR			2SK3581-01L	2SK3581-01S	
	0.38	19	2SK3682-01	2SK3683-01MR		2SK3685-01	2SK3684-01L	2SK3684-01S	FML19N50G
	0.26	25			2SK3523-01R	2SK3522-01			
	0.11	51				2SK3680-01			
600	3.3	3	2SK3988-01	2SK3989-01MR			2SK3990-01L	2SK3990-01S	
	1.2	8	2SK3524-01	2SK3525-01MR			2SK3526-01L	2SK3526-01S	
	1	9	2SK3887-01	2SK3888-01MR			2SK3889-01L	2SK3889-01S	
	0.75	12	2SK3501-01	2SK3502-01MR			2SK3513-01L	2SK3513-01S	
	0.65	13	2SK3450-01	2SK3451-01MR	2SK3753-01R				
	0.57	16	2SK3686-01	2SK3687-01MR		2SK3689-01	2SK3688-01L	2SK3688-01S	
	0.37	21			2SK3528-01R	2SK3527-01			
700	0.6	17			2SK3891-01R				
900	8	2.2	2SK3727-01	2SK3728-01MR					
	6.4	2.6	2SK3981-01	2SK3982-01MR			2SK3983-01L	2SK3983-01S	
	4.3	3.7	2SK3698-01	2SK3699-01MR					
	2.5	6.0					2SK3676-01L	2SK3676-01S	

The Super FAP-G series products satisfies the quality assurance level of general consumer use.
If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric.
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

*1: $V_{GS(th)}$: Low voltage type

■ SuperFAP-G Series　Built-in FRED Series

SuperFAP-G Built-in FRED Series			TO-220	TO-220F	TO-247	T-Pack(L)	T-Pack(S)
							
V_{DS} (V)	$R_{DS(on)}$ max. (Ω)	I_D (A)					
500	0.55	13	2SK3695-01	2SK3696-01MR			
600	0.8	11	2SK3928-01	2SK3929-01MR		2SK3930-01L	2SK3930-01S
	0.17	42			2SK3697-01		

The Super FAP-G series products satisfies the quality assurance level of general consumer use. If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric. Do not use the products for equipment requiring strict reliability such as aerospace equipment.

■ Trench Power MOSFET

Low-on resistance and high gate capability

Trench Power MOSFET			TO-220	TO-220F	TO-3P (Q)	TO-247	T-Pack(L)	T-Pack(S)	T-Pack(SJ) [D2-Pack]
									
V_{DS} (V)	$R_{DS(on)}$ max. (Ω)	I_D (A)							
40	0.060	70				2SK4068-01			
60	0.0065	70		2SK3273-01MR					
		80	2SK3270-01				2SK3272-01L	2SK3272-01S 2SK4047-01S	2SK3272-01SJ
		100			2SK3271-01				
75	0.0079	70		2SK3730-01MR					
	0.0085	70						2SK3804-01S	
100	0.0067	80						FMC80N10R6	
		100				FMY100N10R6			
	0.0128	80	FMP80N10T2	FMA80N10T2			FMI80N10T2	FMC80N10T2	
150	0.0245	65	FMP65N15T2	FMA65N15T2			FMI65N15T2	FMC65N15T2	
200	0.0470	49	FMP49N20T2	FMA49N20T2			FMI49N20T2	FMC49N20T2	

The Trench Power MOSFET series products satisfies the quality assurance level of general consumer use.
If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric.
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

■ Automotive Super J MOS® S2/S1 Series

Low-on resistance, low switching noise and low switching loss

Automotive Super J MOS® S2/S1 Series				TO-247		T-Pack(S)
						
V_{DS} (V)	$R_{DS(on)}$ max. (mΩ)	I_D (A)				
		S2 Series	S1 Series	S2 Series	S1 Series	S2 Series
600	160	17.9		FMY60N160S2A		FMC60N160S2A
	125	22.8		FMY60N125S2A		FMC60N125S2A
	99	29.3		FMY60N099S2A		FMC60N099S2A
	88	32.8		FMY60N088S2A		FMC60N088S2A
	79	37.1		FMY60N079S2A		FMC60N079S2A
	70	39.4	47	FMY60N070S2A	FMY47N60S1A	
	62		53		FMY53N60S1A	
	40	66.2	68	FMY60N040S2A	FMY68N60S1A	
	25	95.5		FMY60N025S2A		

Automotive Super J MOS® S2/S1 series of products satisfies the quality assurance level of general automobile use (conforms to AEC-Q101).
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

■ Automotive Super J MOS® S2FD/S1FD Series

Low-on resistance, low switching noise and low switching loss

Automotive Super J MOS® S2FD/S1FD Series			TO-247		T-Pack(S)	
						
V_{DS} (V)	$R_{DS(on)}$ max. (mΩ)	I_D (A)	S2FD Series	S1FD Series	S2FD Series	S1FD Series
400	60	42			FMC40N060S2FDA	
500	71	38.9	FMY50N071S2FDA		FMC50N071S2FDA	
600	145	29		FMY29N60S1FDA		FMC29N60S1FDA
	133	22.8	FMY60N133S2FDA		FMC60N133S2FDA	
	105	29.3	FMY60N105S2FDA		FMC60N105S2FDA	
	82	46		FMY46N60S1FDA		
	81	37.1	FMY60N081S2FDA		FMC60N081S2FDA	
	71	52		FMY52N60S1FDA		
	46	67		FMY67N60S1FDA		
650	71	52		FMY52N65S1FDA		

The Automotive Super J MOS® S2FD/S1FD series of products satisfies the quality assurance level of general automobile use (conforms to AEC-Q101).
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

■ Automotive Trench Power MOS, SuperFAP-E^{3S} Series

AEC Q101

Automotive Trench Power MOSFET SuperFAP-E^{3S} Low Qg Series			TO-220	TO-220F	TO-3P (Q)	TO-247	T-Pack(L)	T-Pack(S)	T-Pack(SJ) [D2-Pack]
									
V_{DS} (V)	$R_{DS(on)}$ max. (Ω)	I_D (A)							
40	0.006	70				2SK4068-01			
60	0.0065	70		2SK3273-01MR					
		80	2SK3270-01				2SK3272-01L	2SK3272-01S	2SK3272-01SJ
								2SK4047-01S	
	0.0065	100			2SK3271-01	FMY100N06T			
75	0.0079	70		2SK3730-01MR					
	0.0085							2SK3804-01S	
100	0.0067	80					FMC80N10R6		
		100				FMY100N10R6			
300	0.085	47				FMY47N30ESF *1			
	0.072	50				FMY50N30ES			
	0.053	67				FMY67N30ESF *1			
	0.045	72				FMY72N30ES			
600	0.29	22				FMY22N60ESF *1			
	0.28	24				FMY24N60ES			
	0.21	30				FMY30N60ESF *1			
	0.20	31				FMY31N60ES			
	0.17	35				FMY35N60ESF *1			
	0.16	36				FMY36N60ES			

*1: Built-in FRED Type

■ Automotive IPS series (Intelligent Power Switches)

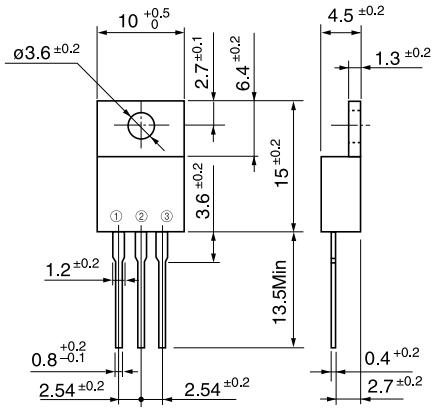
Self protection (Over current / overtemperature protection)

Device Type	Type	Channels	V_{CC} DC (V)	I_D (A)	$R_{DS(on)}$ max.(Ω)	Status output	Package	Remarks
F5045P	High side	1	33	1	0.6		SOP-8	2 − Input Type
F5106H			35	2	0.12			Built-in Amp
F5044H			33	2.5		✓		
F5112H			35	2		✓		Low stand by current version for F5044H
F5062H			35	50	0.008		PSOP-12	
F5074H				80	0.005			
F5041	Low side	2	40	1	0.6		SOP-8	
F5033								
F5020		1		3	0.4		K-Pack(S)	
F5055		2		5.9	0.14		SSOP-20	
F5018		1		8			K-Pack(S)	
F5042								High frequency switching version for F5018
F5019				12			T-Pack(S)	
F5043								High frequency switching version for F5019
F5063L		2		1.9		✓	SOP-8	
F5048		1	80	15	0.125		T-Pack(S)	

SOP-8	PSOP-12	SSOP-20	K-Pack(S)	T-Pack(S)
				

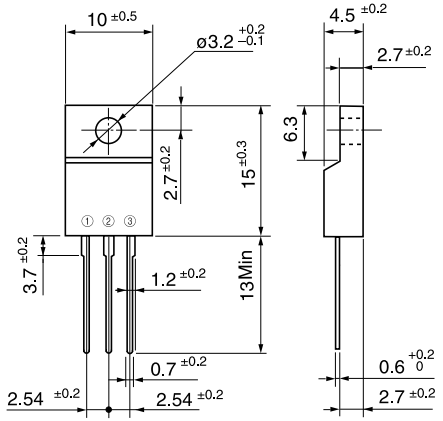
Package Outlines, mm

TO-220



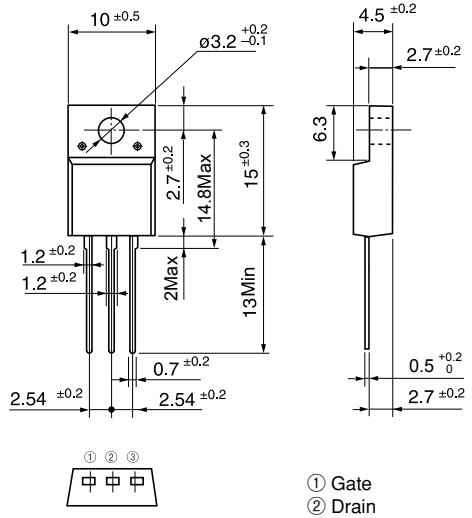
① Gate
② Drain
③ Source

TO-220F



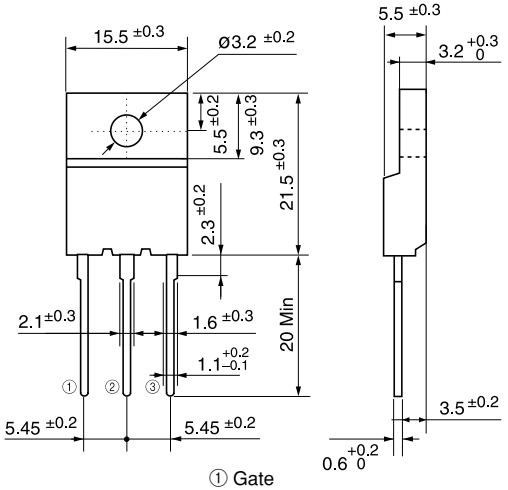
① Gate
② Drain
③ Source

TO-220F(SLS)



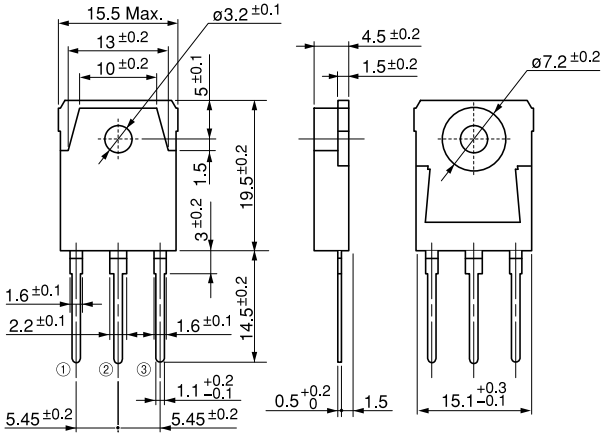
① Gate
② Drain
③ Source

TO-3PF



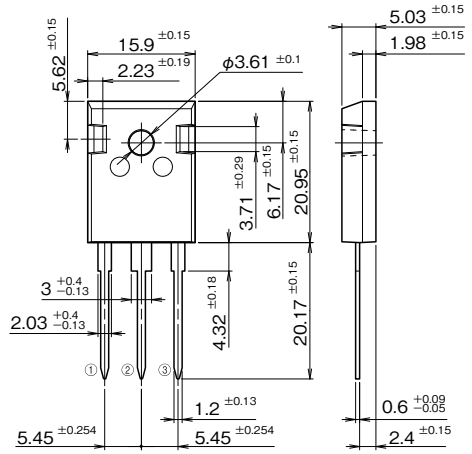
① Gate
② Drain
③ Source

TO-3P(Q)



① Gate
② Drain
③ Source

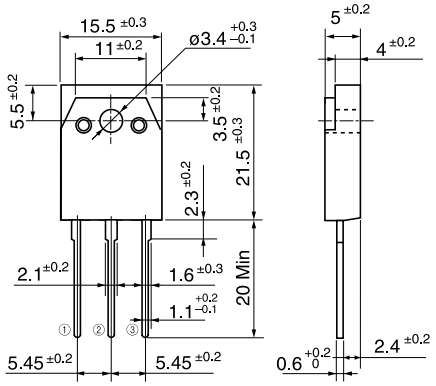
TO-247-P2



① Gate
② Drain
③ Source

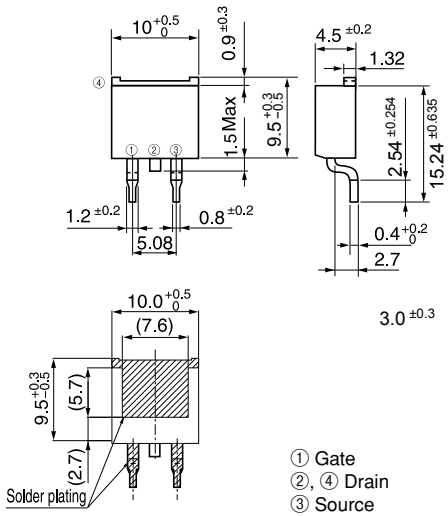
Package Outlines, mm

TO-247



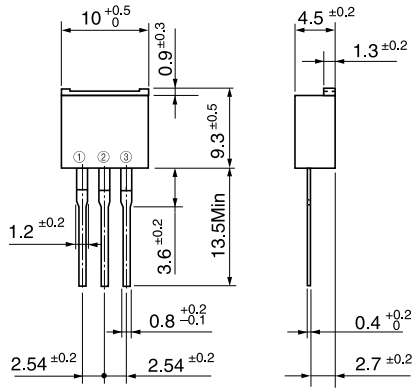
① Gate
② Drain
③ Source

T-Pack(SJ) [D2-Pack]



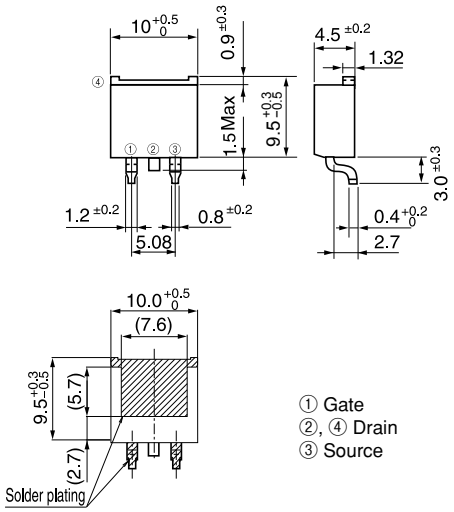
① Gate
②, ④ Drain
③ Source

T-Pack(L)



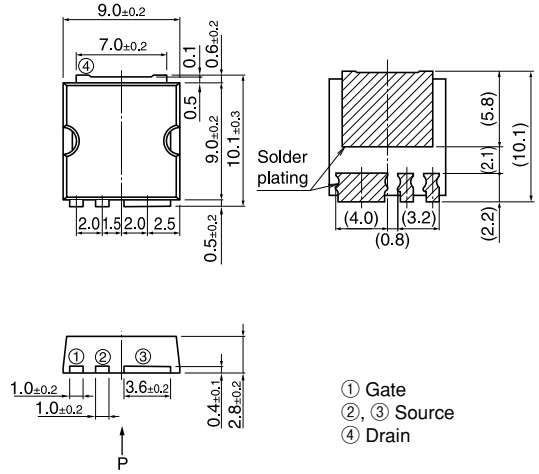
① Gate
② Drain
③ Source

T-Pack(S)



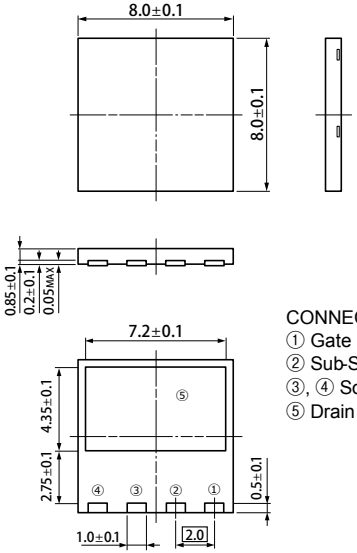
① Gate
②, ④ Drain
③ Source

TFP



① Gate
②, ③ Source
④ Drain

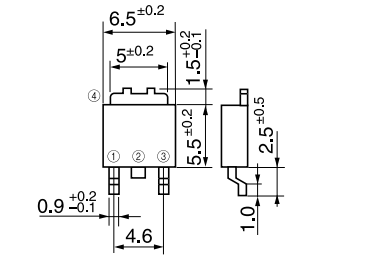
DFN8×8

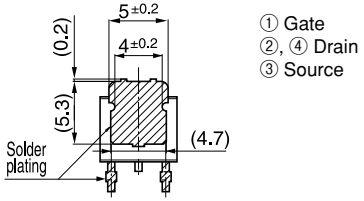


CONNECTION
① Gate
② Sub-Source for Gate Drive
③, ④ Source
⑤ Drain

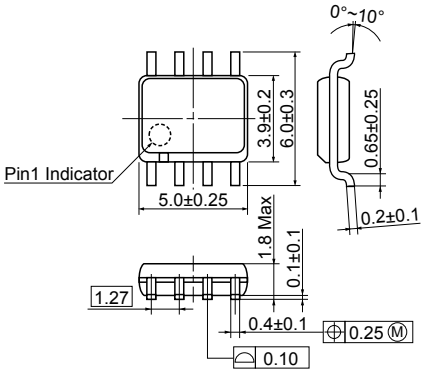
Package Outlines, mm

K-Pack(S)

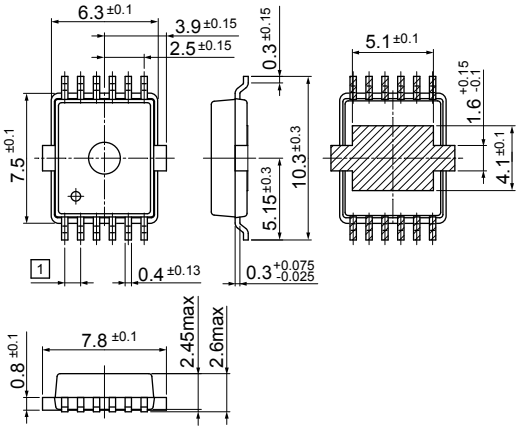




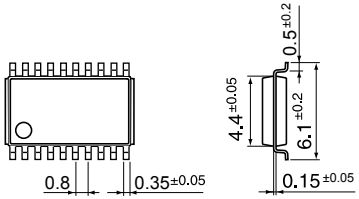
SOP-8

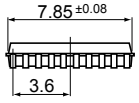


PSOP-12



SSOP-20





Package Outlines, mm

WARNING

1. This Catalog contains the product specifications, characteristics, data, materials, and structures as of September 2018.
   The contents are subject to change without notice for specification changes or other reasons. When using a product listed in this Catalog, be sure to obtain the latest specifications.

2. All applications described in this Catalog exemplify the use of Fuji's products for your reference only. No right or license, either express or implied, under any patent, copyright, trade secret or other intellectual property right owned by Fuji Electric Co., Ltd. is (or shall be deemed) granted. Fuji Electric Co., Ltd. makes no representation or warranty, whether express or implied, relating to the infringement or alleged infringement of other's intellectual property rights which may arise from the use of the applications described herein.

3. Although Fuji Electric Co., Ltd. is enhancing product quality and reliability, a small percentage of semiconductor products may become faulty. When using Fuji Electric semiconductor products in your equipment, you are requested to take adequate safety measures to prevent the equipment from causing a physical injury, fire, or other problem if any of the products become faulty. It is recommended to make your design fail-safe, flame retardant, and free of malfunction.

4. The products introduced in this Catalog are intended for use in the following electronic and electrical equipment which has normal reliability requirements.
   • Computers • OA equipment • Communications equipment (terminal devices) • Measurement equipment
   • Machine tools • Audiovisual equipment • Electrical home appliances • Personal equipment • Industrial robots etc.

5. If you need to use a product in this Catalog for equipment requiring higher reliability than normal, such as for the equipment listed below, it is imperative to contact Fuji Electric Co., Ltd. to obtain prior approval. When using these products for such equipment, take adequate measures such as a backup system to prevent the equipment from malfunctioning even if a Fuji's product incorporated in the equipment becomes faulty.
   • Transportation equipment (mounted on cars and ships) • Trunk communications equipment
   • Traffic-signal control equipment • Gas leakage detectors with an auto-shut-off feature
   • Emergency equipment for responding to disasters and anti-burglary devices • Safety devices
   • Medical equipment

6. Do not use products in this Catalog for the equipment requiring strict reliability such as the following and equivalents to strategic equipment (without limitation).
   • Space equipment • Aeronautic equipment • Nuclear control equipment
   • Submarine repeater equipment

8. If you have any question about any portion in this Catalog, ask Fuji Electric Co., Ltd. or its sales agents before using the product.
   Neither Fuji Electric Co., Ltd. nor its agents shall be liable for any injury caused by any use of the products not in accordance with instructions set forth herein.

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