Panasonic

FJ4B01120L1

Single P-channel MOS FET

■ Features

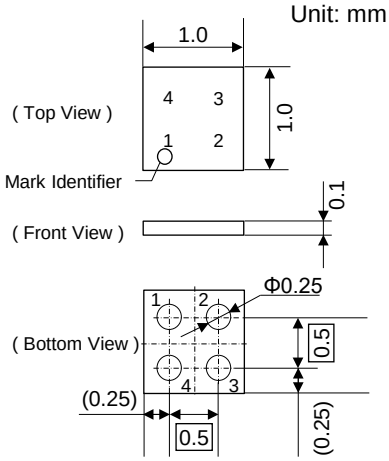
- Drain-source On-state Resistance : RDS(on) typ. = 40 mΩ (VGS = -2.5 V)
- CSP(Chip Size Package)
- Halogen-free / RoHS compliant (EU RoHS / UL-94 V-0 / MSL : Level 1)

■ Marking Symbol : 1F

■ Packaging

Embossed type (Thermo-compression sealing) : 1 000 pcs / reel (standard)

Unit: mm



1. Gate
2. Drain
3. Source
4. Source

Panasonic	ULGA004-W-1010-RA01
JEITA	—
Code	—

■ Absolute Maximum Ratings Ta = 25 ºC

Parameter		Symbol	Rating	Unit
Drain-source Voltage		VDS	-12	V
Gate-source Voltage		VGS	±8	V
Drain Current	DC	ID1 *1	-2.6	A
		ID2 *2	-4.2	A
		ID3 *3	-5.4	A
	Pulsed *4	IDp1	-20	A
		IDp2	-33	A
		IDp3	-43	A
Total Power Dissipation		PD1 *1	0.37	W
		PD2 *2	0.94	W
		PD3 *3	1.5	W
Channel Temperature		Tch	150	°C
Operating Ambient Temperature		Topr	-40 to +85	°C
Storage Temperature Range		Tstg	-55 to +150	°C

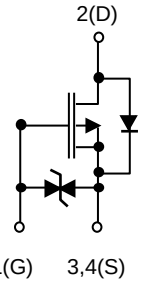
Note *1 FR4 board (25.4mm×25.4mm×t1.0mm)、Min Cu 36mm^2 Copper.

*2 FR4 board (25.4mm×25.4mm×t1.0mm)、Full Cu.

*3 Ceramic substrate (70mm×70mm×t1.0mm).

*4 t = 10 μs, Duty Cycle ≤ 1 %

Equivalent circuit



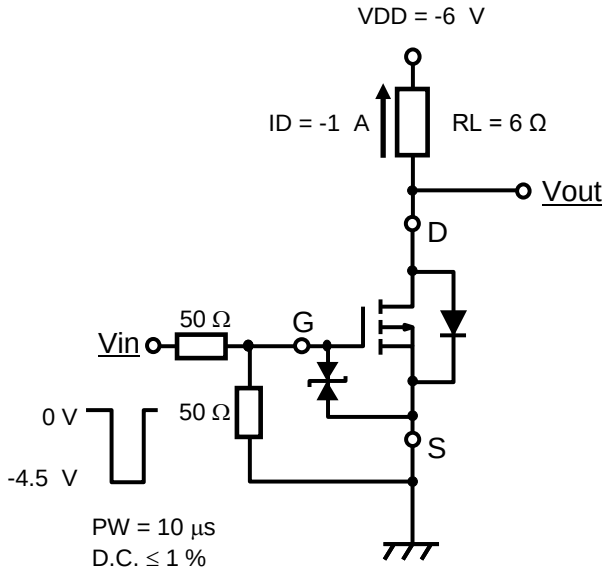
■ Electrical Characteristics Ta = 25 ºC ± 3 ºC

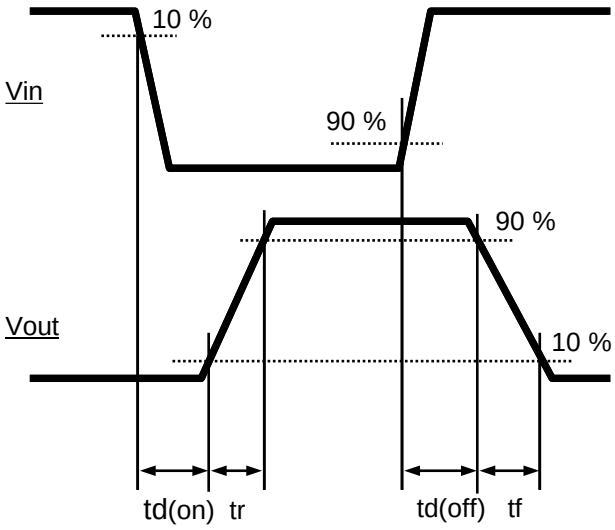
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source Breakdown Voltage	VDSS	ID = -1 mA, VGS = 0	-12			V
Zero Gate Voltage Drain Current	IDSS	VDS = -12 V, VGS = 0			-1	μA
Gate-source Leakage Current	IGSS	VGS = ±8 V, VDS = 0 V			±10	μA
Gate-source Threshold Voltage	Vth	ID = -2 mA, VDS = -10 V	-0.3		-1.0	V
Drain-source On-state Resistance	RDS(on)1	ID = -2 A, VGS = -4.5 V		34	51	mΩ
	RDS(on)2	ID = -2 A, VGS = -2.5 V		40	61	
	RDS(on)3	ID = -0.2 A, VGS = -1.8 V		48	85	
	RDS(on)4	ID = -0.1 A, VGS = -1.5 V		57	170	
Body Diode Forward Voltage	VF(s-d)	IF = -0.2 A, VGS = 0 V		-0.7	-1.2	V
Input Capacitance *1	Ciss	VDS = -10 V, VGS = 0 V f = 1 MHz		814		pF
Output Capacitance *1	Coss			201		
Reverse Transfer Capacitance *1	Crss			187		
Turn-on Delay Time *1,*2	td(on)	VDD = -6 V, VGS = 0 to -4.5 V ID = -1 A		6		ns
Rise Time *1,*2	tr			4		
Turn-off Delay Time *1,*2	td(off)	VDD = -6 V, VGS = -4.5 to 0 V ID = -1 A		63		
Fall Time *1,*2	tf			46		
Total Gate Charge *1	Qg	VDD = -6 V, VGS = -4.5 V ID = -1 A		10.7		nC
Gate-source Charge *1	Qgs			1.4		
Gate-drain Charge *1	Qgd			2.1		

Note Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.

*1 Guaranteed by design, not subject to production testing.

*2 Measurement circuit for Turn-on Delay Time / Rise Time / Turn-off Delay Time / Fall Time.



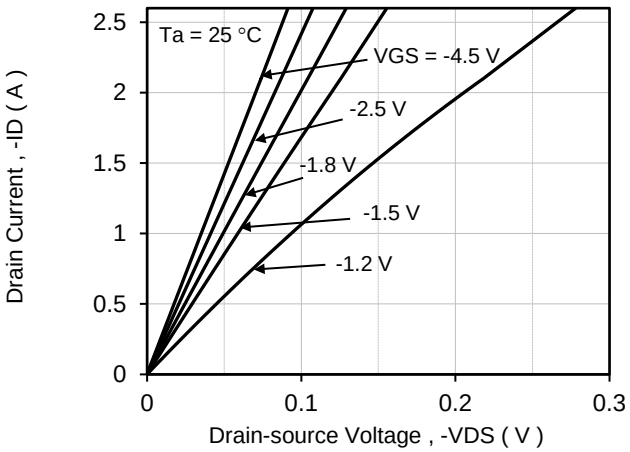


■ Electrical State Discharge Characteristics

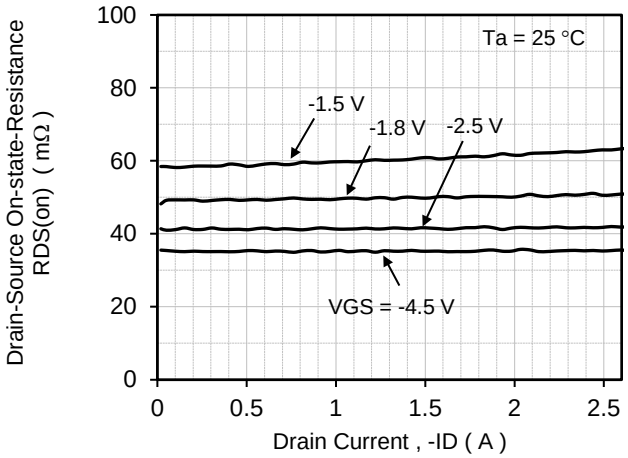
Standard	Test Type	Symbol	Conditions	Class	Value	Unit
AEC-Q101	Human Body Model	HBM	C = 100 pF, R = 1.5 kΩ	H1C	> 1k to ≤ 2k	V
	Machine Model	MM	C = 200 pF, R = 0 Ω	M2	> 100 to ≤ 200	V

Technical Data (reference)

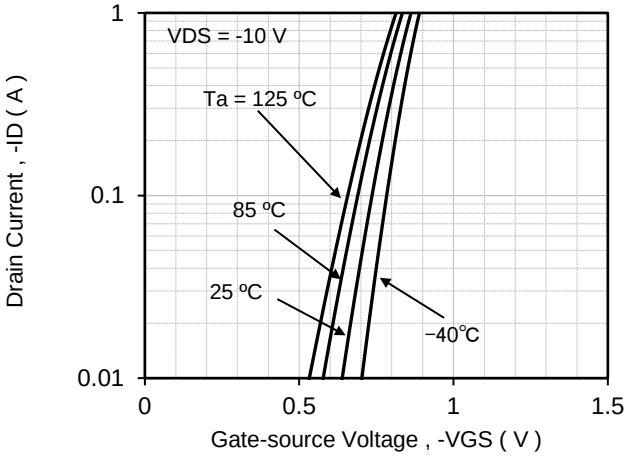
ID - VDS[*1]



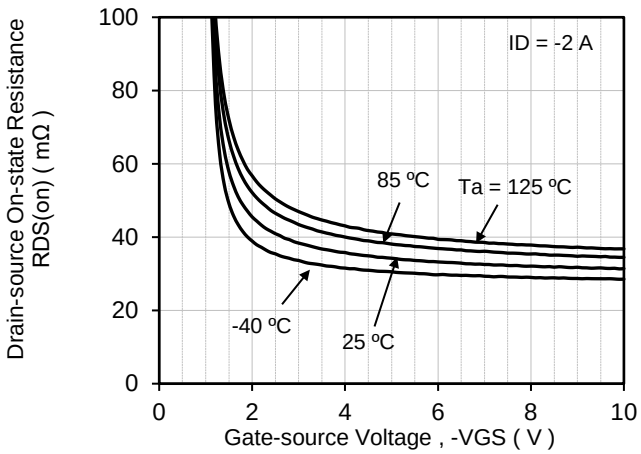
RDS(on) - ID[*1]



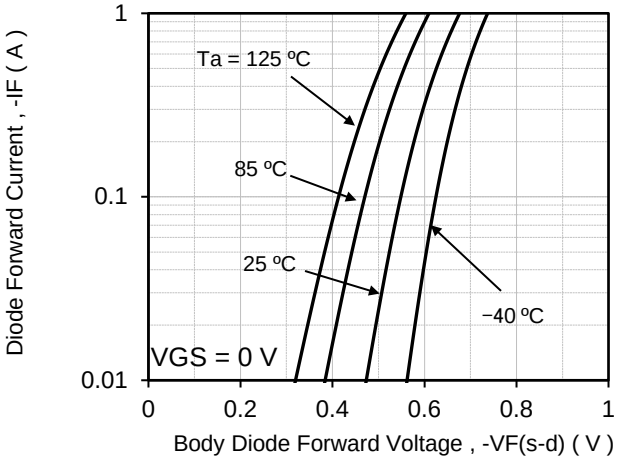
ID - VGS[*1]



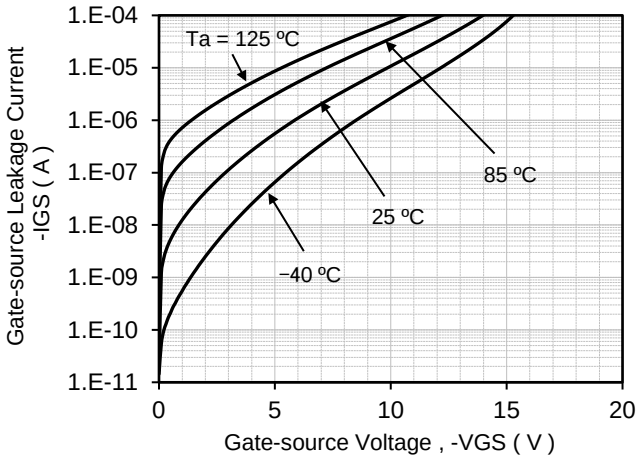
RDS(on) - VGS[*1]



IF - VF(s-d)[*1]

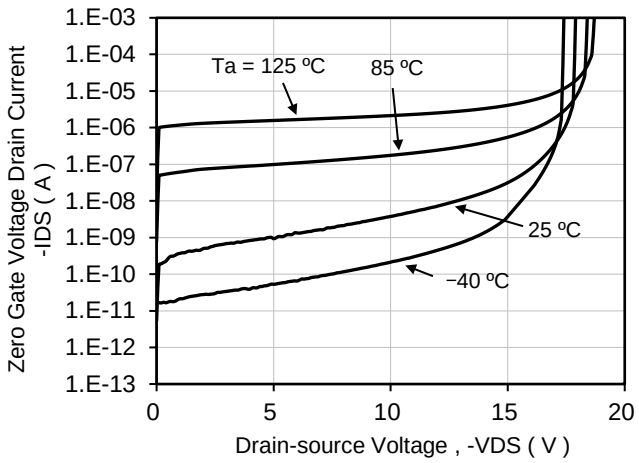


IGS - VGS[*1]

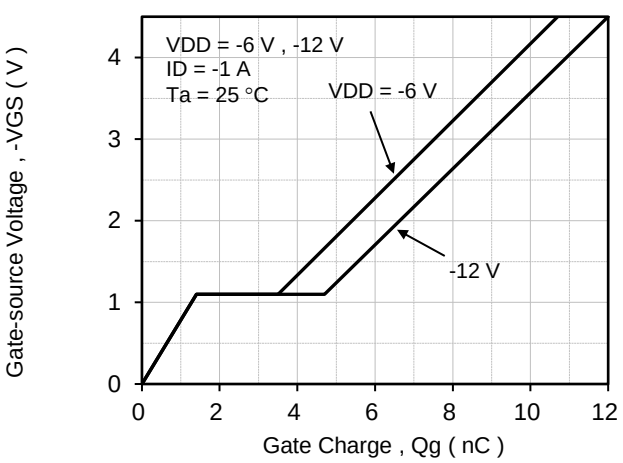


Technical Data (reference)

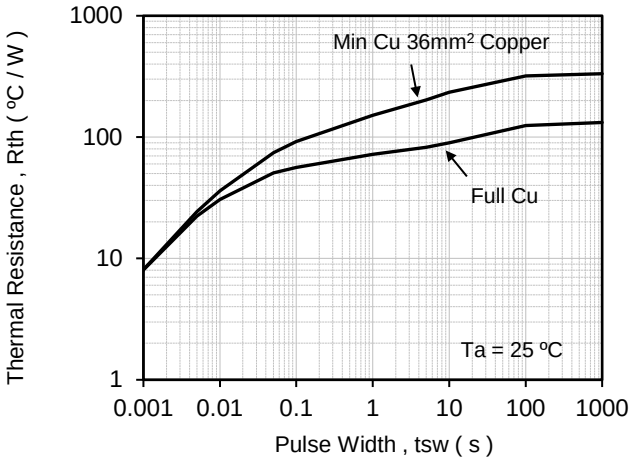
IDS - VDS[*1]



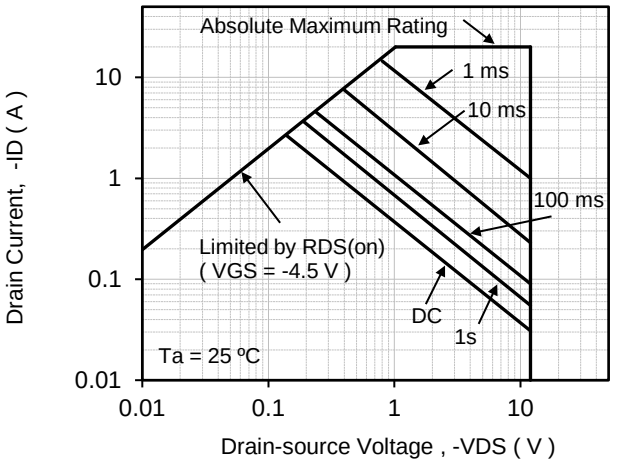
Dynamic Input / Output Characteristics



Rth - tsw[*2*3]



Safe Operating Area[*2]



Note

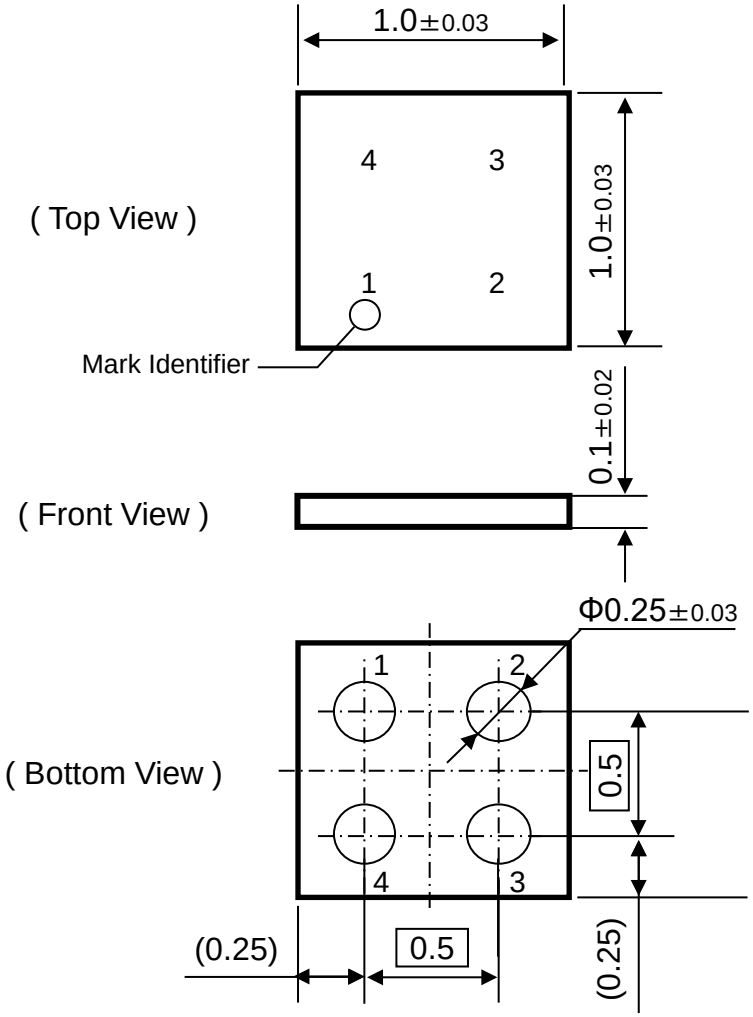
*1 Pulse measurement

*2 FR4 board (25.4mm×25.4mm×t1.0mm)、Min Cu 36mm^2 Copper.

*3 FR4 board (25.4mm×25.4mm×t1.0mm)、Full Cu.

■ Outline

Unit: mm



■ Land & Stencil Pattern (Reference)

Unit: mm