

Dual N-channel Power MOSFET 20V, 30mohm, 3.4A

Product Summary

VSSS	VGSS	RSS(ON) TYP/MAX	IS MAX
20V	± 12V	28/32mΩ@VGS=4.5V 30/36mΩ@VGS=3.8V 33/40mΩ@VGS=3.1V 36/50mΩ@VGS=2.5V	3.4A

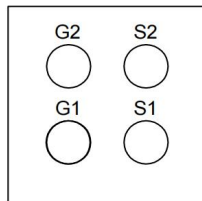
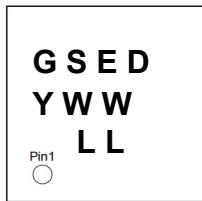
Features

- ❖ Source-source ON resistance: $R_{ss(on)}$ typ. = 30 mΩ ($V_{GS} = 4.0$ V)
- ❖ CSP (Chip Size Package)
- ❖ Halogen-free / RoHS compliant (EU RoHS / UL-94 V-0 / MSL: Level 1)

Package & Internal Circuit

TOP VIEW

BOTTOM VIEW



GS : Gostone
E : Marking Device Code (fixed)
D : Factory Code
Y : Year Code
W : Week Code
L : LOT Code
○ : Pin#1 Identifier

Ordering Information

Part Number	Package Type	Package Qty
GTD2005A	WLCSP_1.1*1.1	8.000/Tape & Reel

Absolute Maximum Rating ($T_a=25^{\circ}\text{C}$)

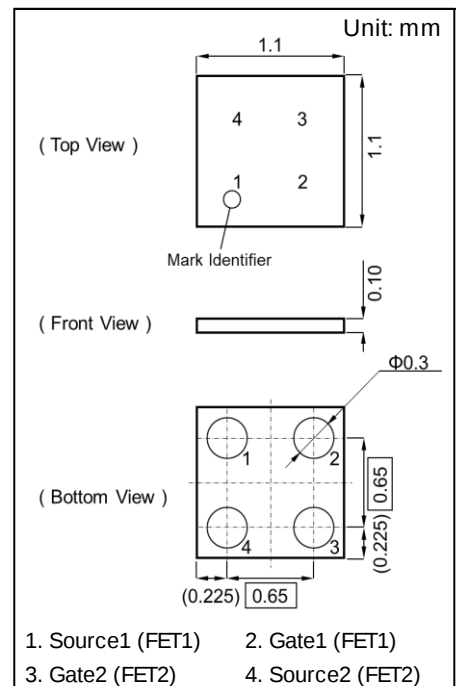
Parameter	Symbol	Rating	Unit
Source-source Voltage	VSS	20	V
Gate-source Voltage	VGS	±12	V
Source Current	DC	IS1 *1	A
		IS2 *2	
		IS3 *3	
	Pulsed *4	ISp	34
Total Power Dissipation	DC	PD1 *1	W
		PD2 *2	
		PD3 *3	
Channel Temperature	Tch	150	°C
Storage Temperature Range	Tstg	-55 to +150	°C

Thermal Characteristic ($T_a=25^{\circ}\text{C}$)

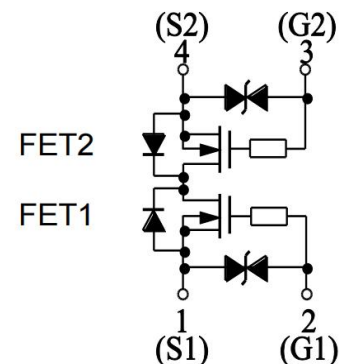
Parameter	Symbol	Rating	Unit
Thermal Resistance (ch-a)	Rth1 *1	292	°C/W
	Rth2 *2	113	
	Rth3 *3	66	

- Note
- *1 Mounted on FR4 board (25.4 mm x 25.4 mm x t1.0 mm), FR4 board partially covered with copper pad (18 mm² area, 36 μm thickness).
 - *2 Mounted on FR4 board (25.4 mm x 25.4 mm x t1.0 mm), FR4 board fully covered with copper pad (608 mm² area, 36 μm thickness).
 - *3 Mounted on Ceramic board (70 mm x 70 mm x t1.0 mm).
 - *4 $t = 10$ μs, Duty Cycle ≤ 1 %

Package & Internal Circuit



Equivalent circuit





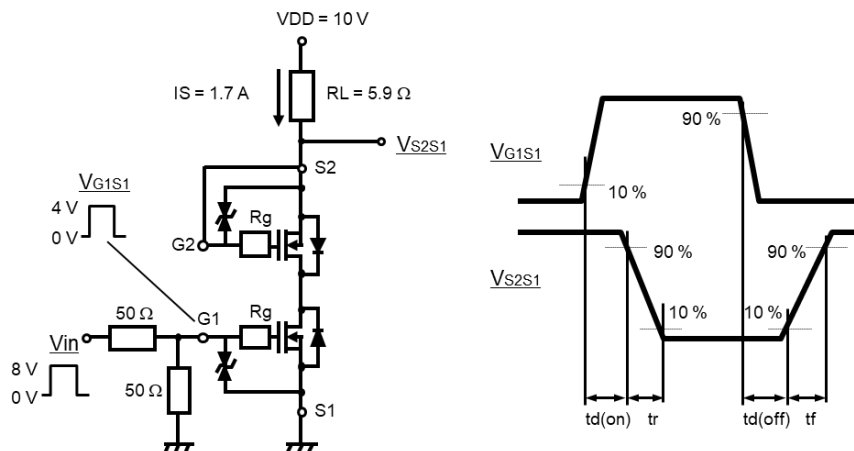
Electrical characteristics (Ta=25°C ± 3°C)

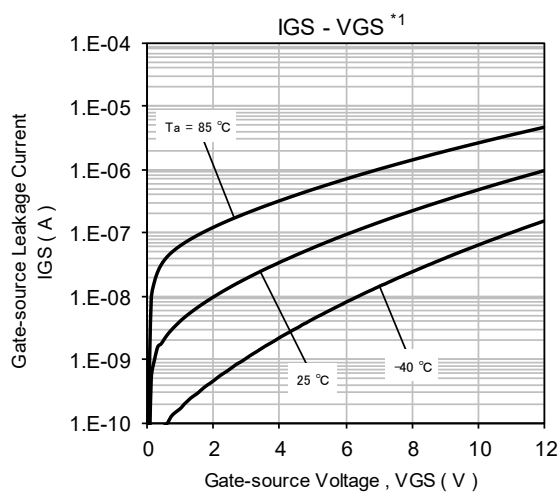
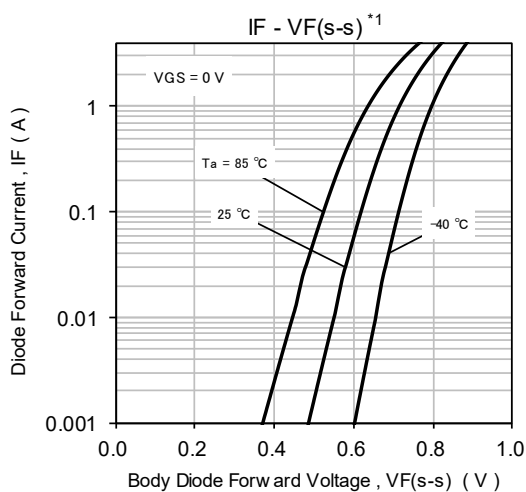
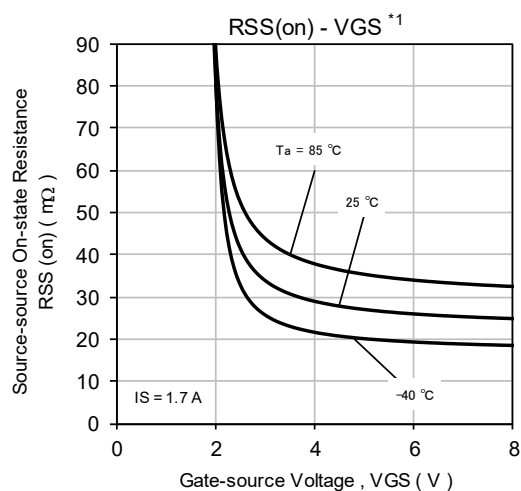
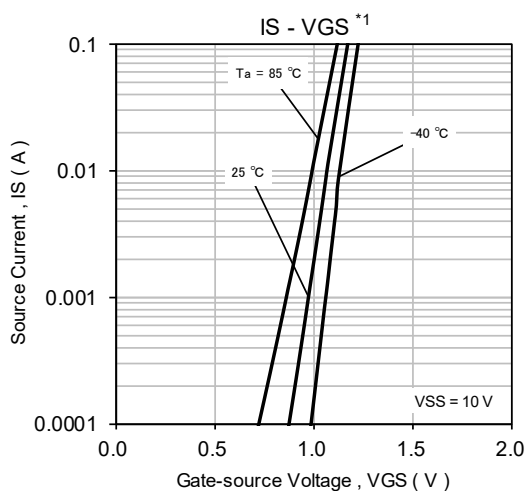
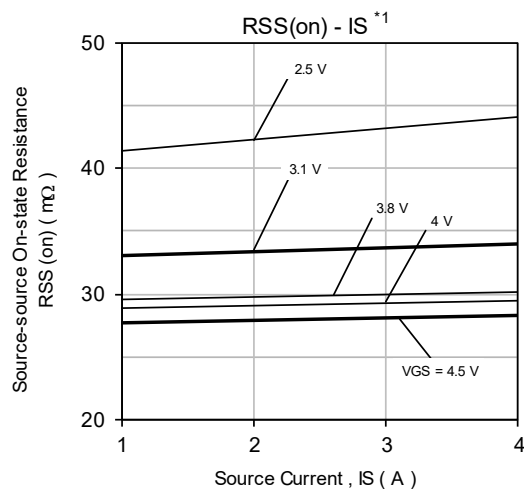
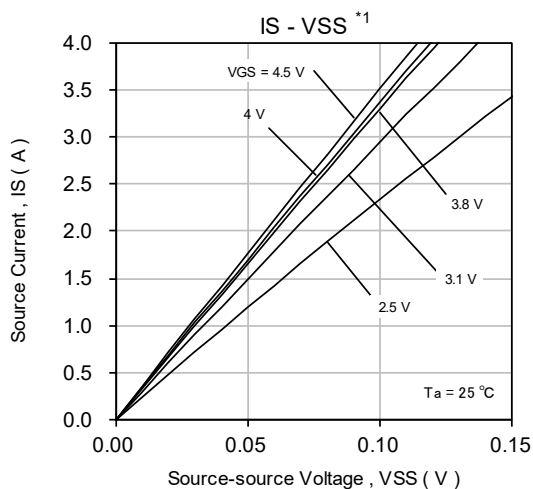
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-source Breakdown Voltage	VSSS	IS = 1 mA, VGS = 0 V	20			V
Zero Gate Voltage Source Current	ISSS	VSS = 20 V, VGS = 0 V			1.0	μA
Gate-Source Leakage Current	IGSS1	VGS = ±8 V, VSS = 0 V			±1.0	μA
	IGSS2	VGS = ±3.8 V, VSS = 0 V			±0.1	
Gate-source Threshold Voltage	Vth	IS = 0.16 mA, VSS = 10 V	0.35	0.9	1.4	V
Source-source On-state Resistance	RSS(on)1	IS = 1.7 A, VGS = 4.5 V	23	28	32	mΩ
	RSS(on)2	IS = 1.7 A, VGS = 4.1 V	23.5	29.5	34	
	RSS(on)3	IS = 1.7 A, VGS = 4.0 V	24	30	35	
	RSS(on)4	IS = 1.7 A, VGS = 3.8 V	24	30.5	36	
	RSS(on)5	IS = 1.7 A, VGS = 3.7 V	24.5	31	37	
	RSS(on)6	IS = 1.7 A, VGS = 3.1 V	25	33	40	
	RSS(on)7	IS = 1.7 A, VGS = 2.5 V	26	36	50	
Body Diode Forward Voltage	VF(s-s)	IF = 1.7 A, VGS = 0 V		0.8	1.2	V
Input Capacitance *1	Ciss	VSS = 10 V, VGS = 0 V, f = 1 kHz		426		pF
Output Capacitance *1	Coss			84		
Reverse Transfer Capacitance *1	Crss			71		
Turn-on Delay Time *1,*2	td(on)	VDD = 10 V, VGS = 0 to 4 V IS = 1.7 A		0.11		μs
Rise Time *1,*2	tr			0.28		
Turn-off Delay Time *1,*2	td(off)	VDD = 10 V, VGS = 4 to 0 V IS = 1.7 A		0.66		μs
Fall Time *1,*2	tf			0.46		
Total Gate Charge *1	Qg	VDD = 10 V		4.5		nC
Gate-source Charge *1	Qgs	VGS = 0 to 4 V		1.1		
Gate-drain Charge *1	Qgd	IS = 3.4 A		1.2		

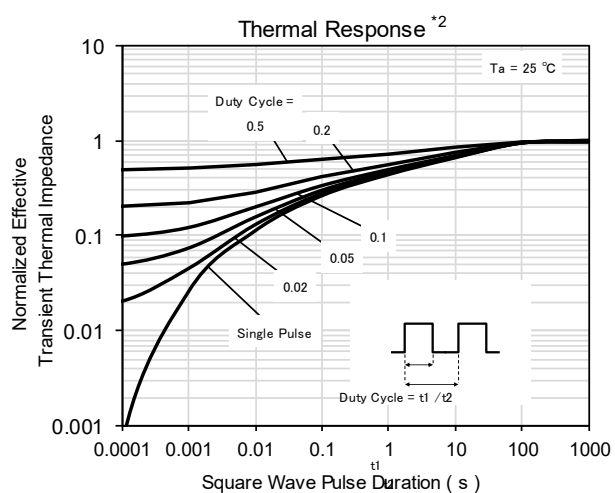
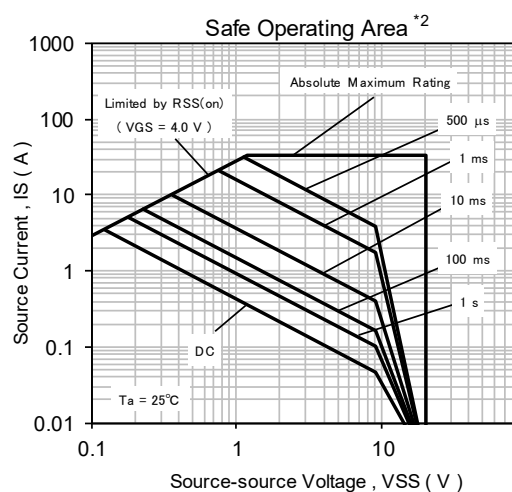
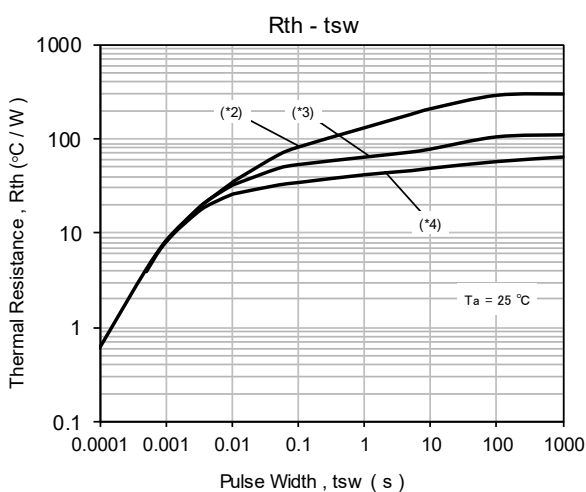
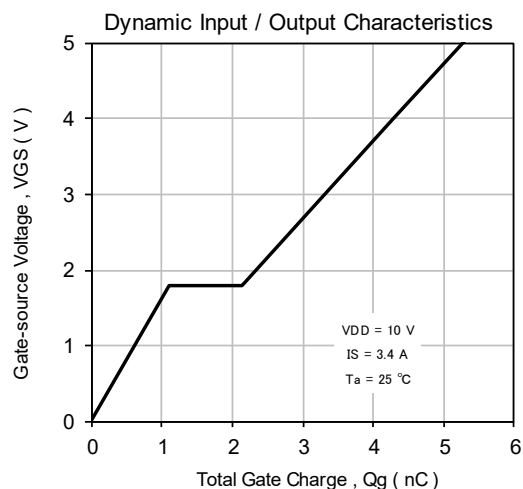
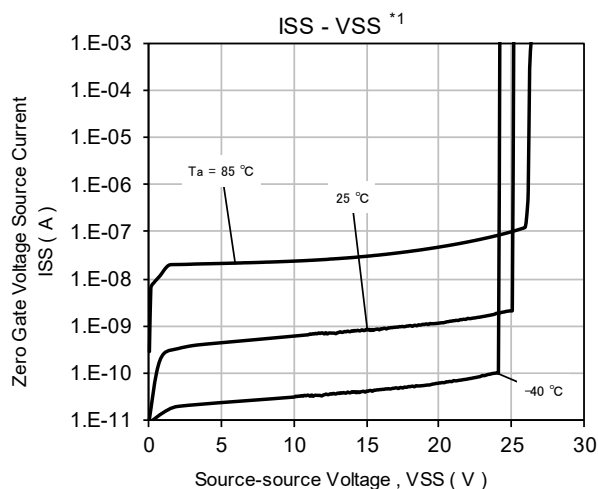
Note:

*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



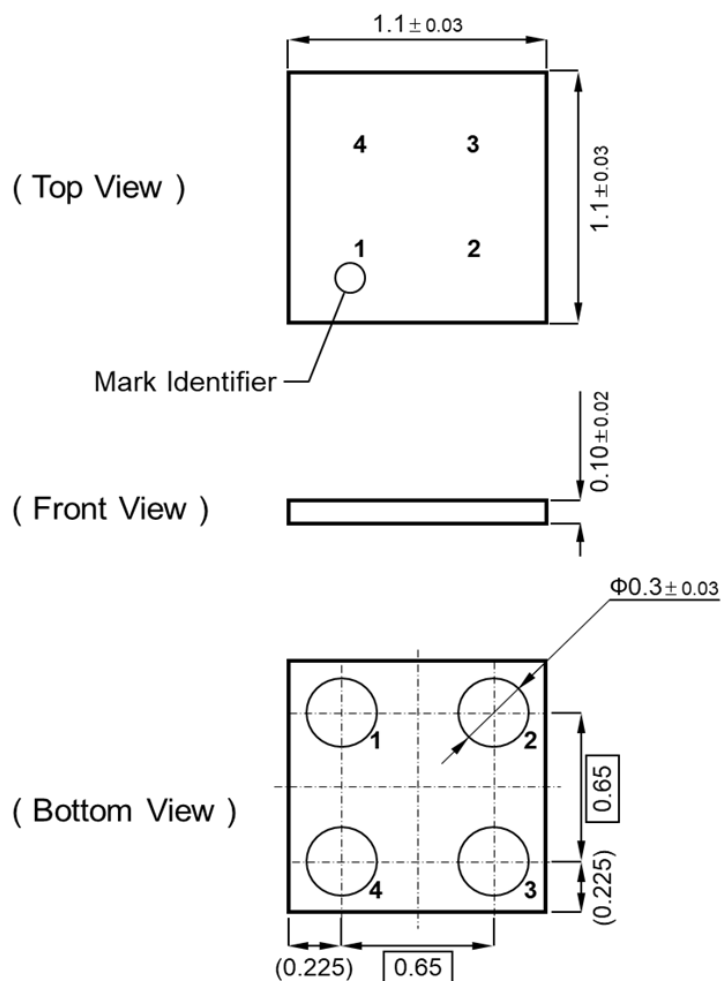
Typical Electrical and Thermal Characteristics (Curves)


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Note

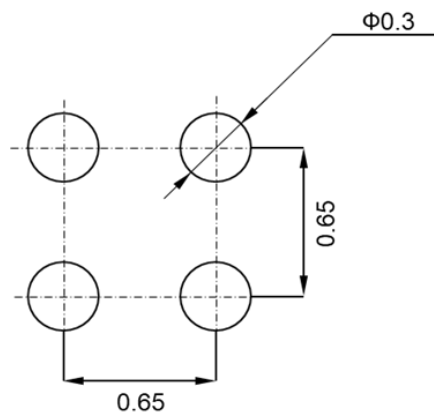
- *1 Pulse measurement.
- *2 Mounted on FR4 board (25.4 mm × 25.4 mm × t1.0 mm).
FR4 board partially covered with copper pad
(18 mm² area, 36 μm thickness).
- *3 Mounted on FR4 board (25.4 mm × 25.4 mm × t1.0 mm).
FR4 board fully covered with copper pad
(608 mm² area, 36 μm thickness).
- *4 Mounted on ceramic board (70 mm × 70 mm × t1.0 mm).

Package outline dimensions

Unit : mm


Land & Stencil Pattern (reference)

Unit : mm



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