

Dual N-channel MOSFET

KFCAB24073NL

Datasheet

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1. GENERAL DESCRIPTION

Gate resistor installed Dual N-channel MOSFET for lithium-ion secondary battery protection circuits.

2. FEATURES

- Source-source On-state Resistance: $R_{SS(on)}$ typ = 3.0 m Ω (V_{GS} = 10 V)
- CSP (Chip Size Package)
- Halogen-free / RoHS compliant (EU RoHS / UL-94 V-0 / MSL: Level 1)

3. MARKING SYMBOL: KE

4. PACKAGING

Embossed type (Thermo-compression sealing): 8,000 pcs / reel (standard)

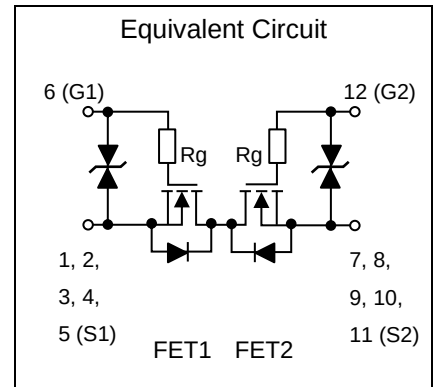
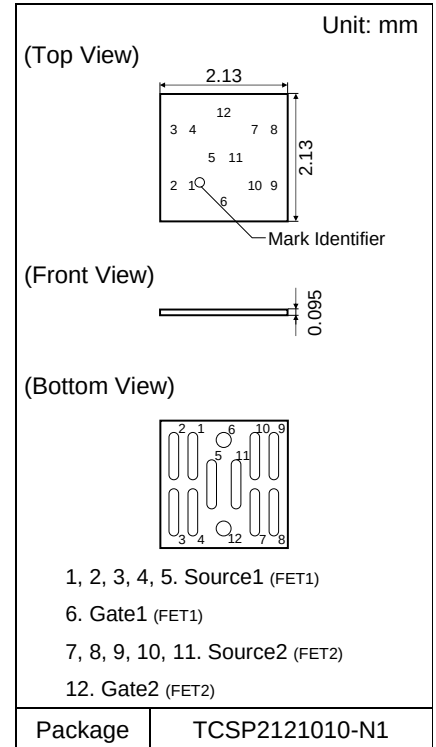
5. ABSOLUTE MAXIMUM RATINGS $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Source-source Voltage	VSS	24	V
Gate-source Voltage	VGS	+ 16 / - 14	V
Source Current	DC ^{*1}	IS1	A
	DC ^{*2}	IS2	
	DC ^{*3}	IS3	
	Pulsed ^{*4}	ISp	
Total Power Dissipation	DC ^{*1}	PD1	W
	DC ^{*2}	PD2	
	DC ^{*3}	PD3	
Operating Junction and Storage Temperature Range	Tj, Tstg	- 55 to + 150	°C

6. THERMAL CHARACTERISTICS $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Thermal Resistance (ch-a)	Rth1 ^{*1}	255	°C / W
	Rth2 ^{*2}	78	
	Rth3 ^{*3}	43	

- Note
- *1 Mounted on FR4 board (25.4 mm x 25.4 mm x t1.0 mm).
FR4 board partially covered with copper pad (39 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 (611 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 $\leq$ 1 %.



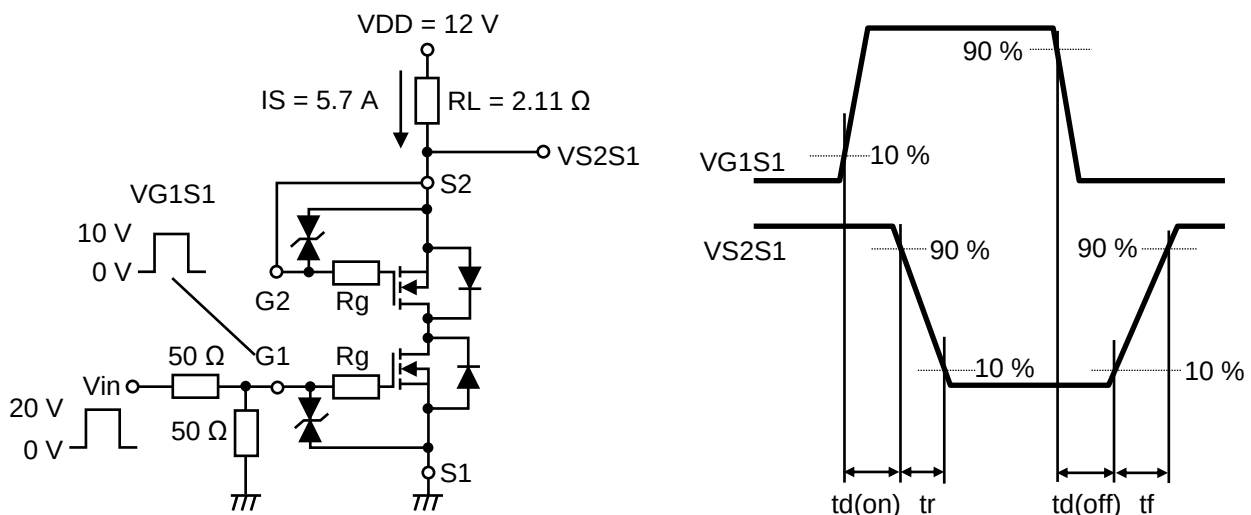
7. ELECTRICAL CHARACTERISTICS $T_a = 25\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-source Breakdown Voltage	VSSS	IS = 1 mA, VGS = 0 V	24			V
Zero Gate Voltage Source Current	ISSS	VSS = 24 V, VGS = 0 V			1	μA
Gate-source Leakage Current	IGSS1	VGS = + 16 V, VSS = 0 V			10	μA
		VGS = - 14 V, VSS = 0 V			- 10	
	IGSS2	VGS = $\pm$ 8 V, VSS = 0 V			$\pm$ 1	
Gate-source Threshold Voltage	Vth	IS = 0.63 mA, VSS = 10 V	1	2	3	V
Source-source On-state Resistance	RSS(on)1	IS = 5.7 A, VGS = 10 V	2.55	3.00	3.75	m Ω
	RSS(on)2	IS = 5.7 A, VGS = 8.0 V	2.65	3.25	4.05	
	RSS(on)3	IS = 5.7 A, VGS = 4.5 V	2.90	5.00	10.7	
Body Diode Forward Voltage	VF(s-s)	IF = 5.7 A, VGS = 0 V		0.75	0.82	V
Input Capacitance ^{*1}	Ciss	VSS = 10 V, VGS = 0 V, f = 1 kHz		3100		pF
Output Capacitance ^{*1}	Coss			330		
Reverse Transfer Capacitance ^{*1}	Crss			260		
Turn-on Delay Time ^{*1, *2}	td(on)	VDD = 12 V, VGS = 0 to 10 V		0.6		μs
Rise Time ^{*1, *2}	tr	IS = 5.7 A		0.8		
Turn-off Delay Time ^{*1, *2}	td(off)	VDD = 12 V, VGS = 10 to 0 V		4.9		μs
Fall Time ^{*1, *2}	tf	IS = 5.7 A		1.9		
Total Gate Charge ^{*1}	Qg	VDD = 12 V		55.6		nC
Gate-source Charge ^{*1}	Qgs	VGS = 0 to 10 V		8.7		
Gate-drain Charge ^{*1}	Qgd	IS = 11.4 A		9.2		
Gate Resistance ^{*1}	Rg	f = 1 MHz	400	700	1000	Ω

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.

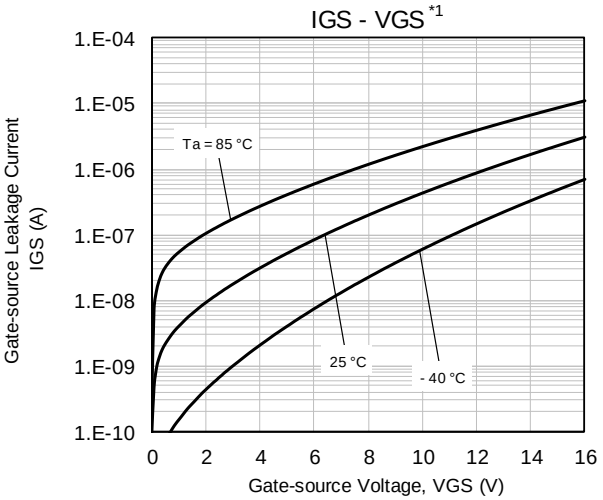
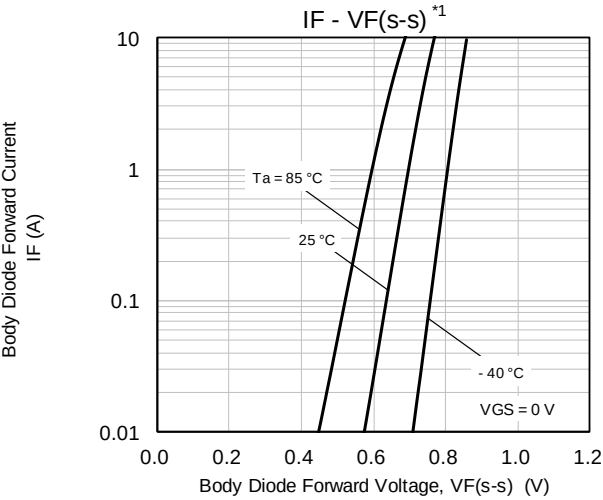
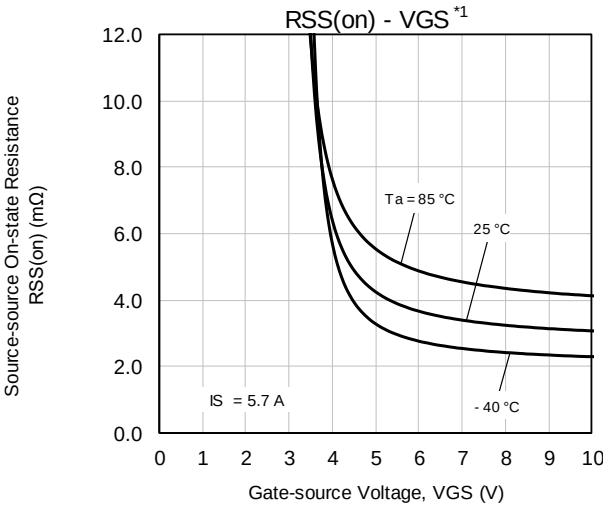
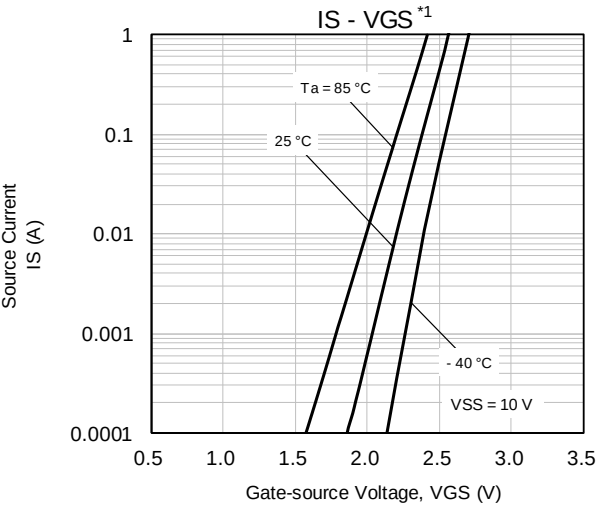
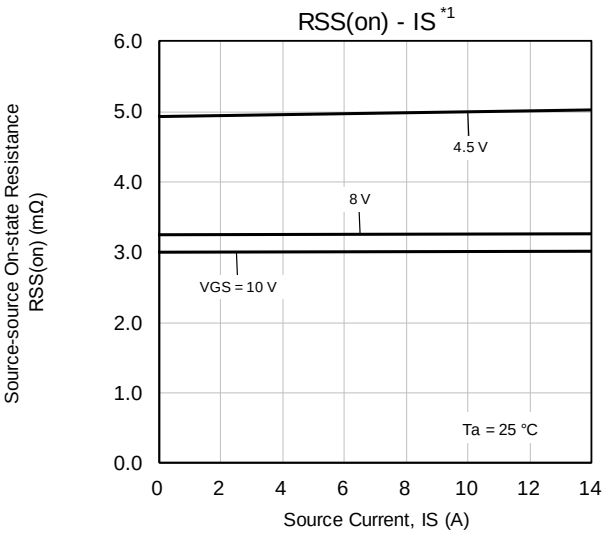
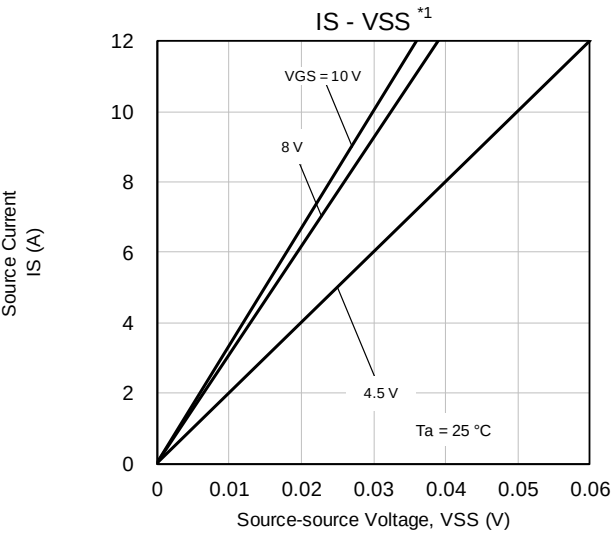
*2 Measurement circuit for Turn-on Delay Time / Rise Time / Turn-off Delay Time / Fall Time.



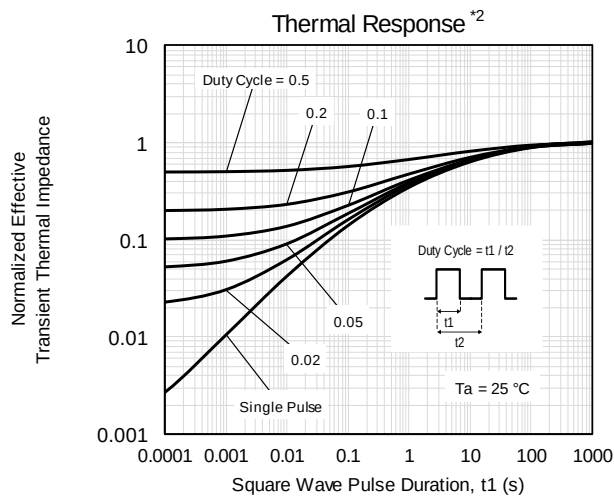
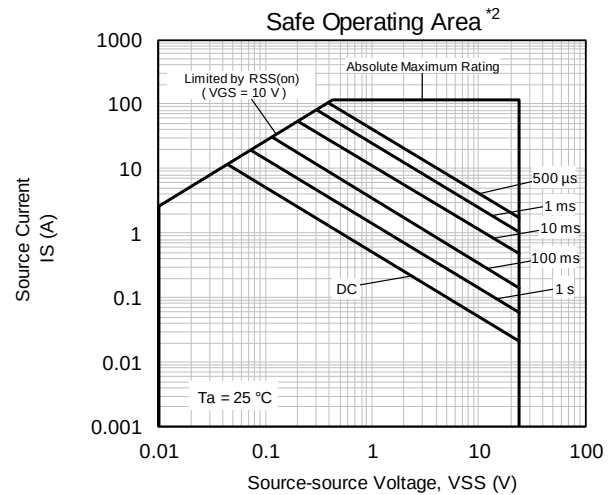
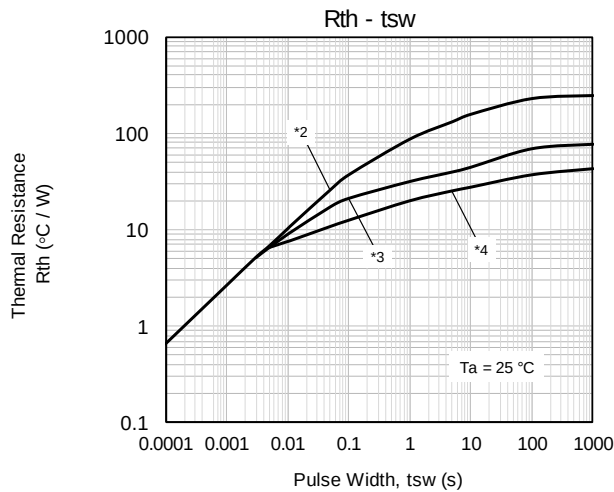
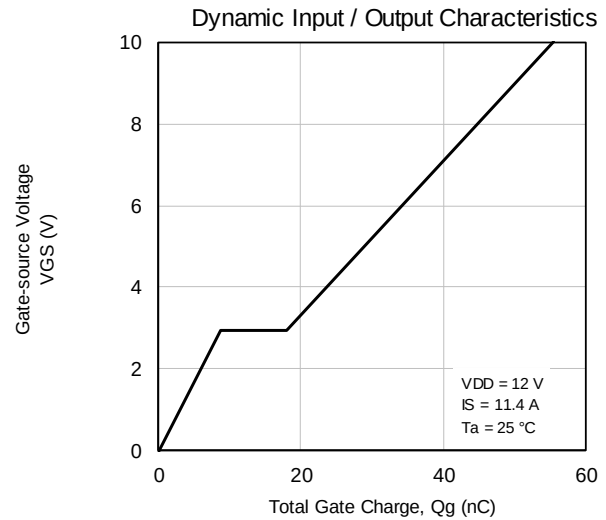
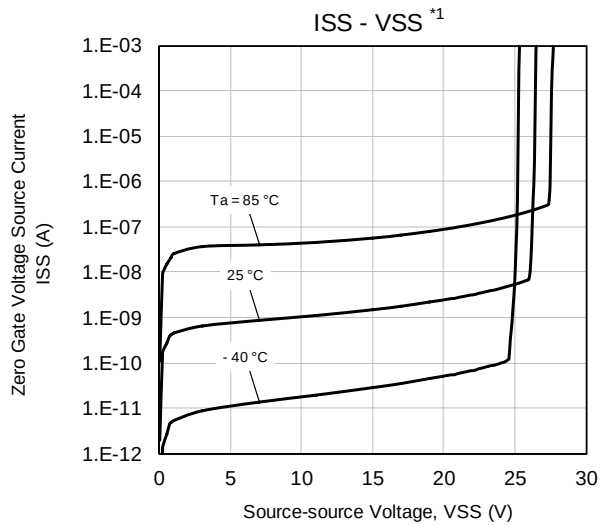
8. ELECTROSTATIC DISCHARGE CHARACTERISTIC $T_a = 25\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$

Standard	Test Type	Symbol	Conditions	Class	Value	Unit
AEC-Q101-001	Human Body Model	HBM	C = 100 pF, R = 1.5 k Ω	H2	> 2k to $\leq$ 4k	V

9. TECHNICAL DATA (Reference)



TECHNICAL DATA (Reference)



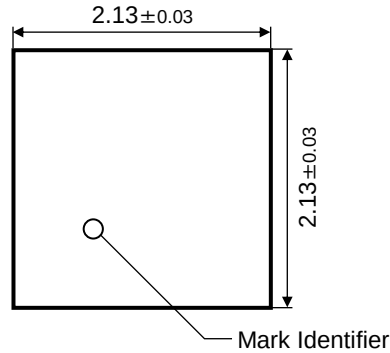
Note

- *1 Pulse measurement.
- *2 Mounted on FR4 board (25.4 mm x 25.4 mm x t1.0 mm).
FR4 board partially covered with copper pad
(39 mm² area, 36 μm thickness).
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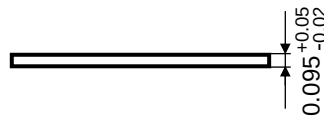
10. OUTLINE

(Top View)

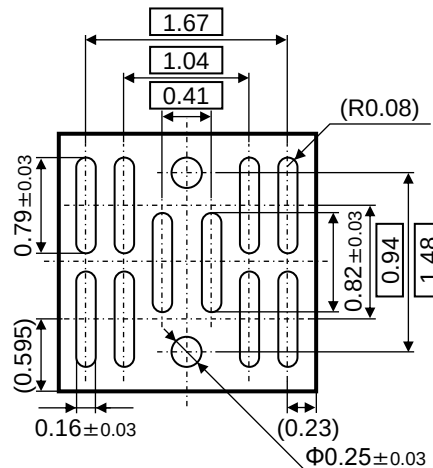
Unit: mm



(Front View)

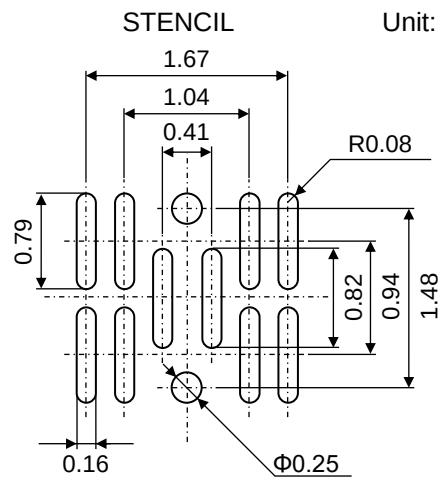
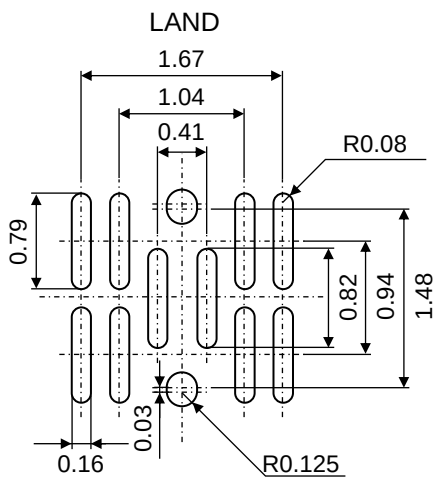


(Bottom View)



11. LAND & STENCIL PATTERN (Reference)

Unit: mm



Important notice:

Solder Mask Defined (SMD) pattern is strongly recommended for pad design.

Please check the information in the Nuvoton WL-CSP Application Notes about mounting process.

12. REVISION HISTORY

Date	Revision	Description
2024.10.9	1.00	1. Initially issued.

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