Ordering number : ENA0869A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

2SK4177 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)$=10Ω(typ.)
- 10V drive
- Input capacitance Ciss=380pF (typ.)

Specifications

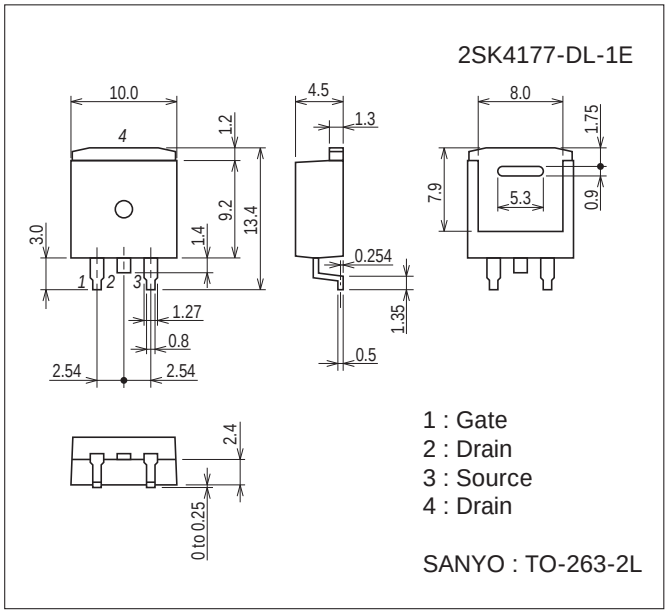
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		1500	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		2	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	4	A
Allowable Power Dissipation	P_D	Tc=25°C	80	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		41	mJ
Avalanche Current *2	I_{AV}		2	A

Note :*1 V_{DD}=50V, L=20mH, I_{AV}=2A (Fig.1)
*2 L≤20mH, single pulse

Package Dimensions

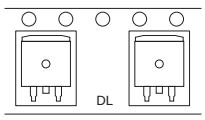
unit : mm (typ)
7535-001



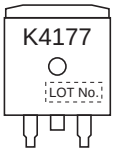
Product & Package Information

- Package : TO-263-2L
- JEITA, JEDEC : SC-83, TO-263
- Minimum Packing Quantity : 800 pcs./reel

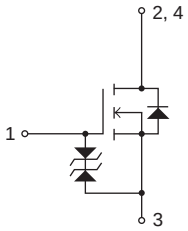
Packing Type: DL



Marking



Electrical Connection



Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	1500			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V			100	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	2.5		3.5	V
Forward Transfer Admittance	| yfs |	V_{DS}=20V, I_D=1A	0.7	1.4		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=1A, V_{GS}=10V		10	13	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		380		pF
Output Capacitance	Coss			70		pF
Reverse Transfer Capacitance	Crss			40		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		12		ns
Rise Time	t_r			37		ns
Turn-OFF Delay Time	t_d(off)			152		ns
Fall Time	t_f			59		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=2A		37.5		nC
Gate-to-Source Charge	Qgs			2.7		nC
Gate-to-Drain “Miller” Charge	Qgd			20		nC
Diode Forward Voltage	V_{SD}	I_S=2A, V_{GS}=0V		0.88	1.2	V

Fig.1 Unclamped Inductive Switching Test Circuit

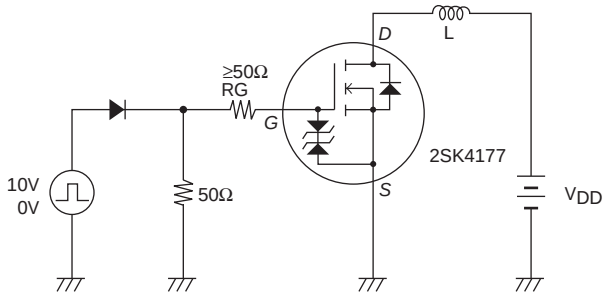
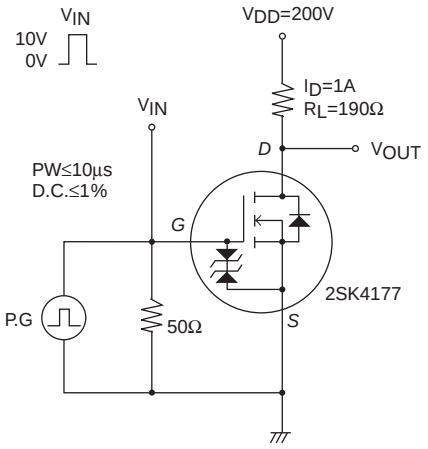
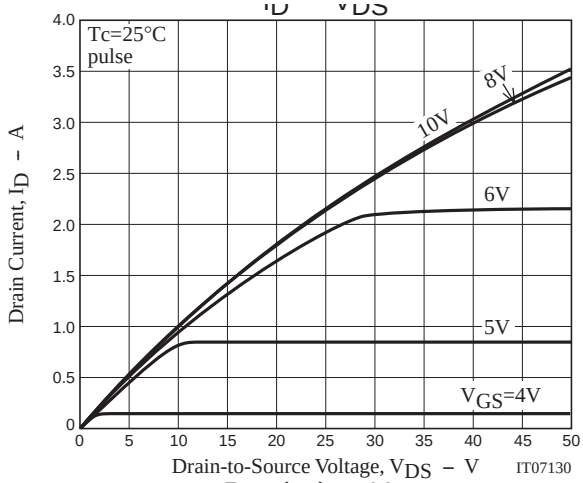


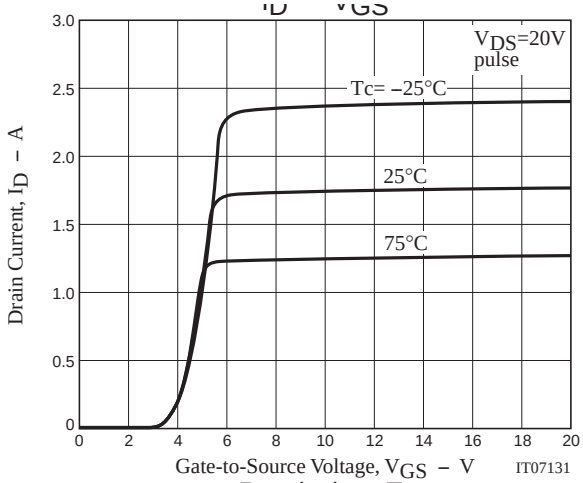
Fig.2 Switching Time Test Circuit

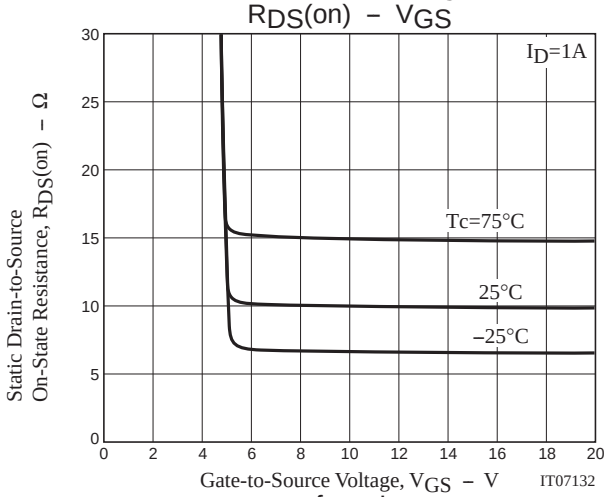


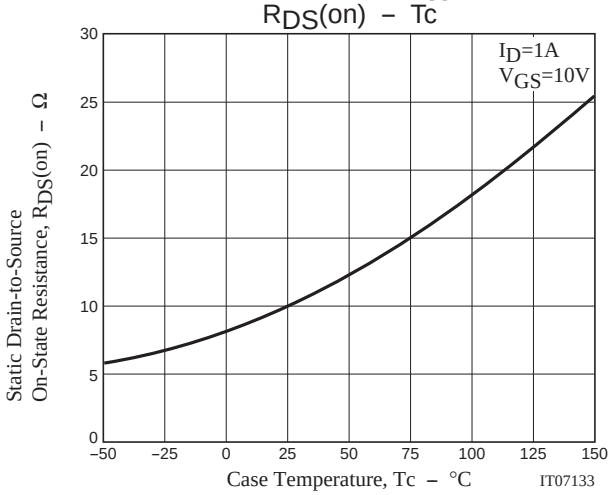
Ordering Information

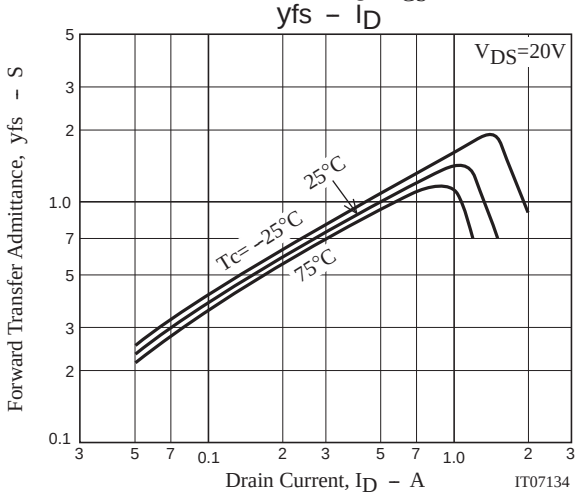
Device	Package	Shipping	memo
2SK4177-DL-1E	TO-263-2L	800pcs./reel	Pb Free

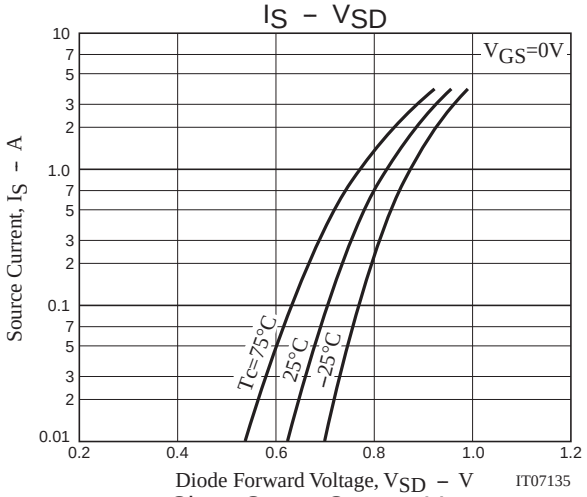

Tc=25°C
pulse
8V
10V
6V
5V
VGS=4V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT07130

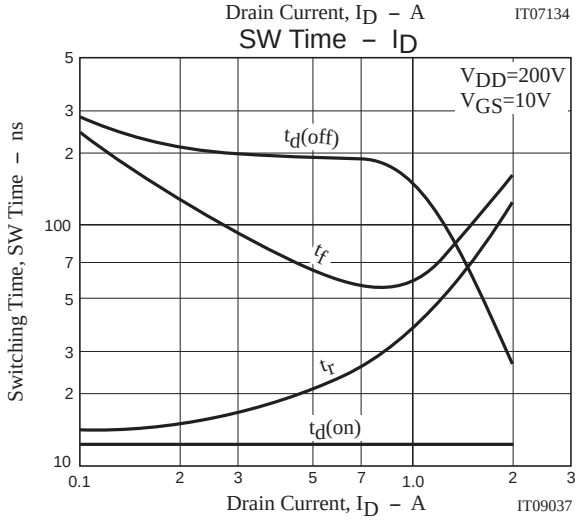

VDS=20V
pulse
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT07131

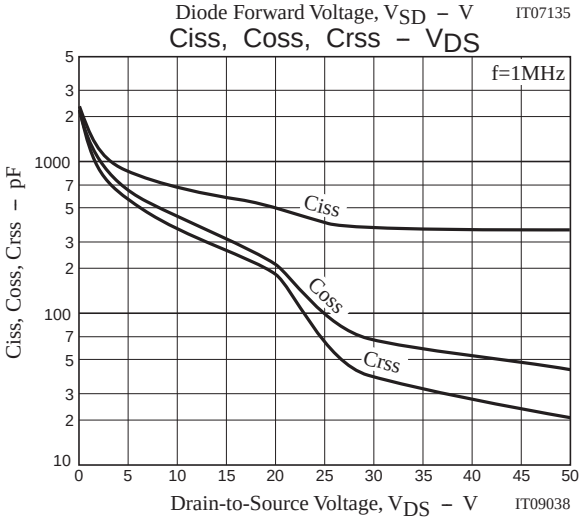

RDS(on) – VGS
ID=1A
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT07132

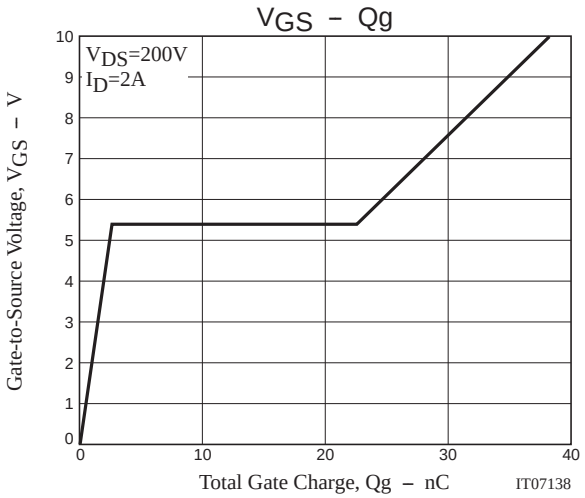

RDS(on) – Tc
ID=1A
VGS=10V
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT07133

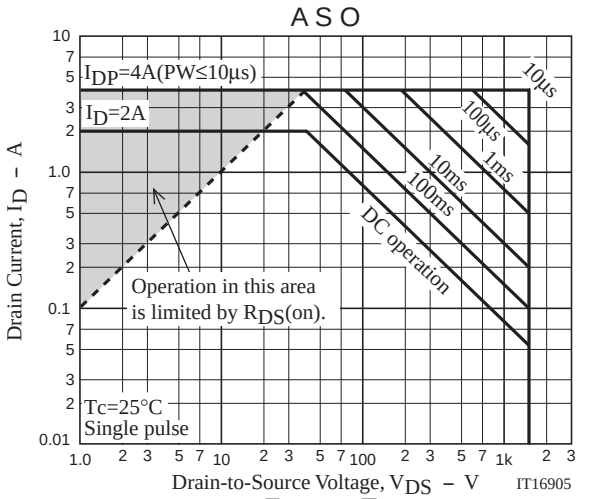

yfs – ID
VDS=20V
Tc= –25°C
25°C
75°C
Forward Transfer Admittance, yfs – S
Drain Current, ID – A
IT07134

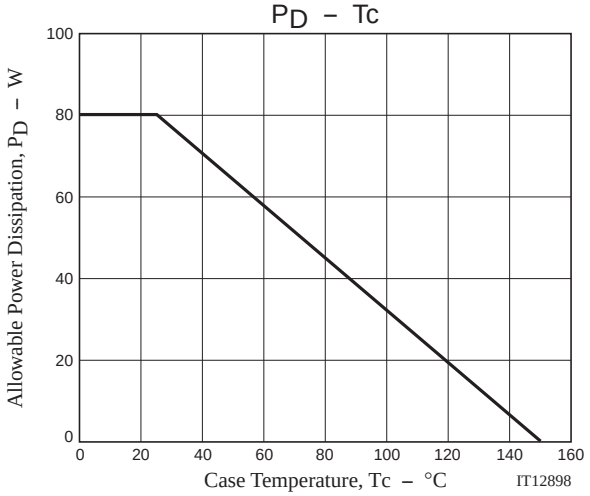

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT07135

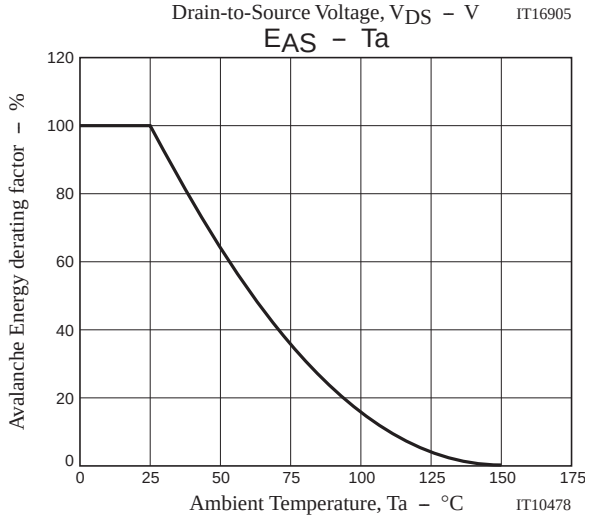

SW Time – ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT09037


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT09038


VGS – Qg
VDS=200V
ID=2A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT07138


A S O
IDP=4A(PW≤10μs)
ID=2A
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this area
is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16905


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT12898


EAS – Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT10478

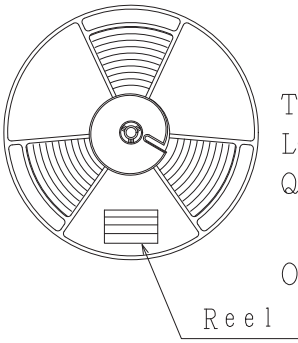
Taping Specification

2SK4177-DL-1E

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			Packing format	
	Reel	Inner box	Outer box	Inner BOX	Outer BOX
TO-263-2L	800	1600	6400	SPD-0V0011 2 reel contained Dimensions:mm(external) 351×340×68	SPD-0V0009 4 inner boxes contained Dimensions:mm(external) 390×370×318

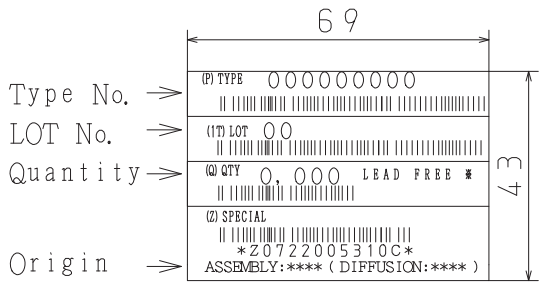
Packing method



Reel label

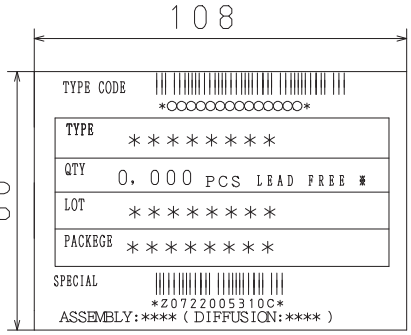
Reel label, Inner box label

(unit:mm)



Outer box label

It is a label at the time of factory shipments. The form of a label may change in physical distribution process.

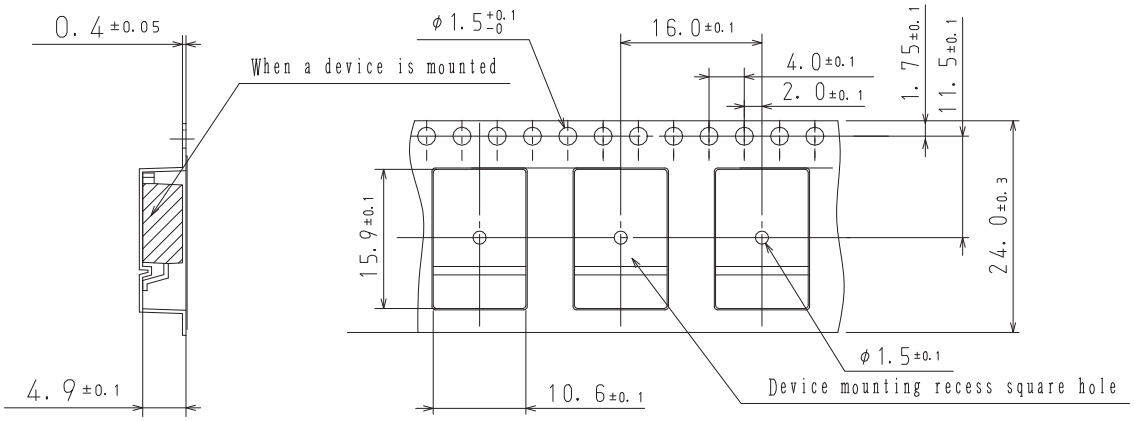


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

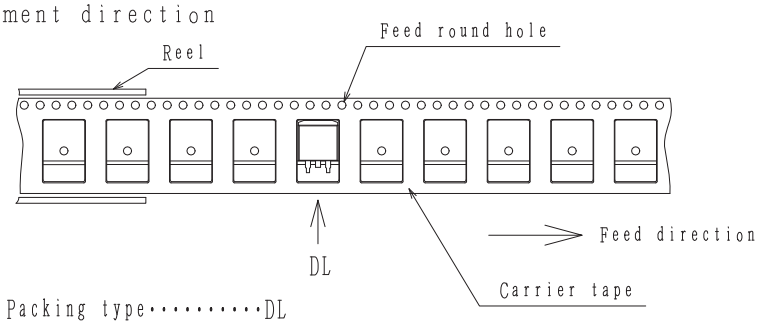
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

2. Taping configuration

2-1. Carrier tape size (unit:mm)

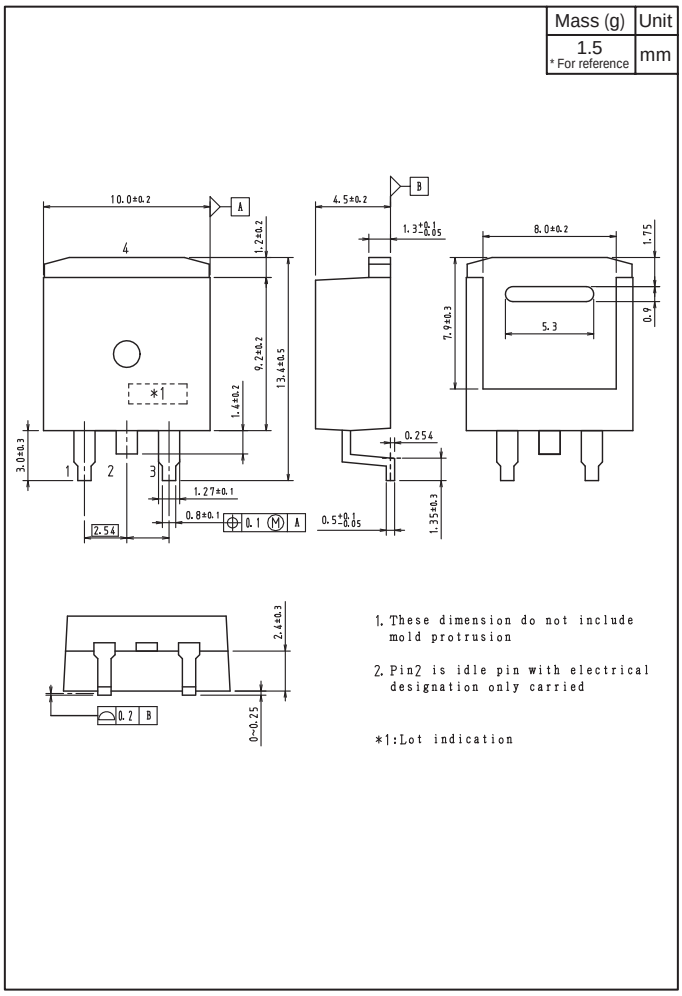


2-2. Device placement direction

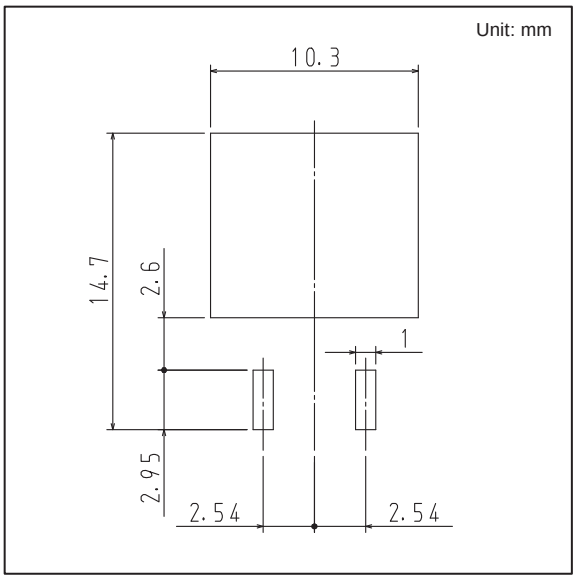


Outline Drawing

2SK4177-DL-1E



Land Pattern Example



Note on usage : Since the 2SK4177 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of December, 2012. Specifications and information herein are subject to change without notice.