



# 2SK4177

## N-Channel Power MOSFET 1500V, 2A, 13Ω, TO-263-2L

ON Semiconductor®

<http://onsemi.com>

### Features

- ON-resistance  $R_{DS(on)}=10\Omega$ (typ.)
- 10V drive
- Input capacitance  $C_{iss}=380pF$  (typ.)

### Specifications

Absolute Maximum Ratings at  $T_a=25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	$V_{DSS}$		1500	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 20$	V
Drain Current (DC)	$I_D$		2	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu s$ , duty cycle $\leq 1\%$	4	A
Allowable Power Dissipation	$P_D$	$T_c=25^\circ C$	80	W
Channel Temperature	$T_{ch}$		150	$^\circ C$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ C$
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)

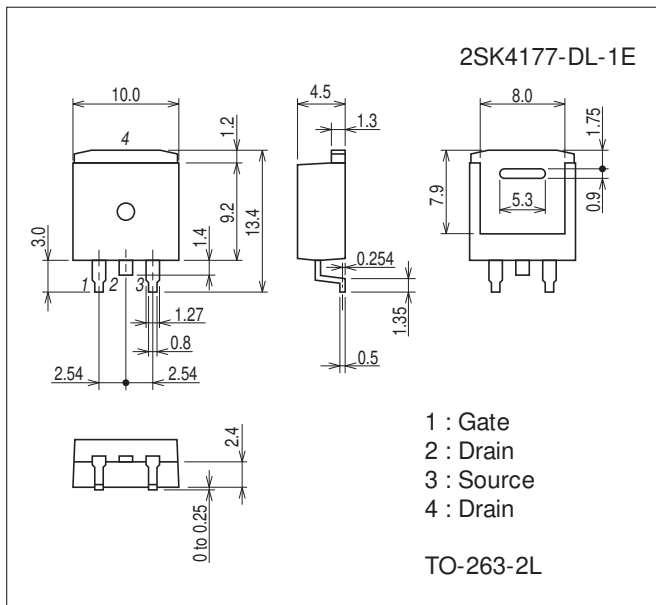
\*2  $L \leq 20mH$ , single pulse

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

unit : mm (typ)

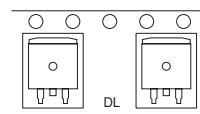
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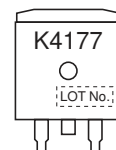
### Product & Package Information

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

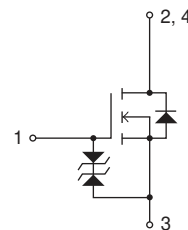
### Packing Type: DL



### Marking



### Electrical Connection

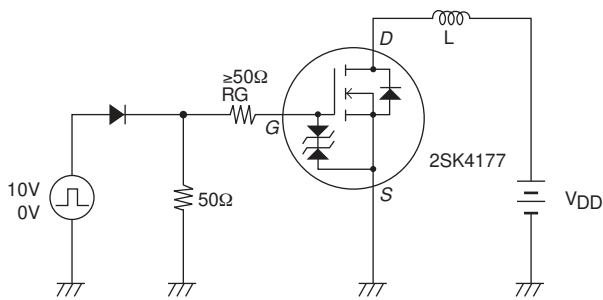


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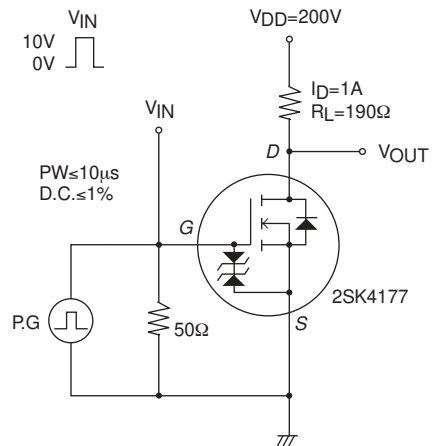
## Electrical Characteristics at Ta=25°C

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	$\mu A$	
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 16V, V_{DS}=0V$			$\pm 10$	$\mu A$	
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	2.5		3.5	V	
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=20V, I_D=1A$	0.7	1.4		S	
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=1A, V_{GS}=10V$		10	13	$\Omega$	
Input Capacitance	$C_{iss}$	$V_{DS}=30V, f=1MHz$		380		pF	
Output Capacitance	$C_{oss}$				70		pF
Reverse Transfer Capacitance	$C_{rss}$				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	$Q_g$	$V_{DS}=200V, V_{GS}=10V, I_D=2A$		37.5		nC	
Gate-to-Source Charge	$Q_{gs}$			2.7		nC	
Gate-to-Drain "Miller" Charge	$Q_{gd}$			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**

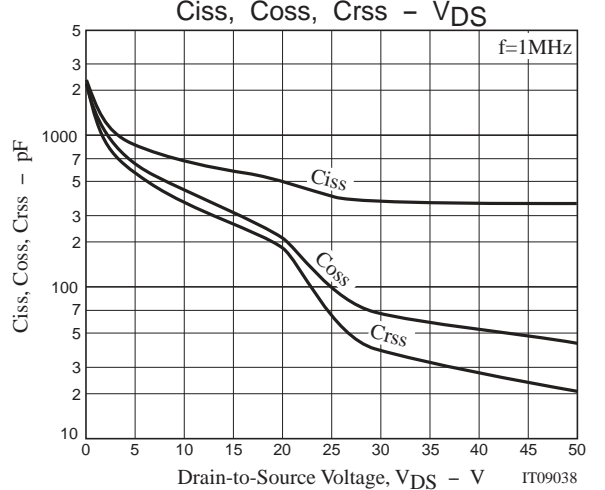
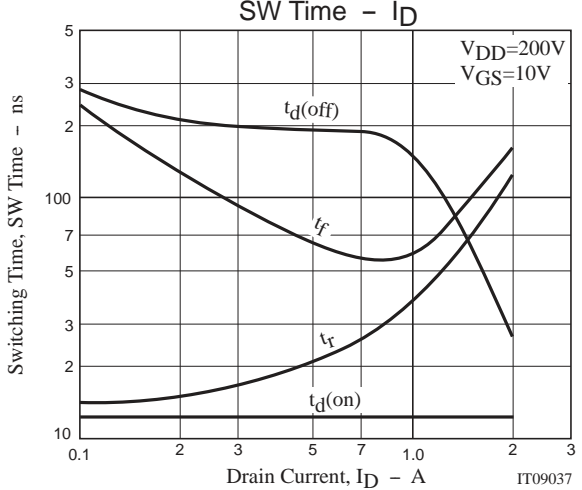
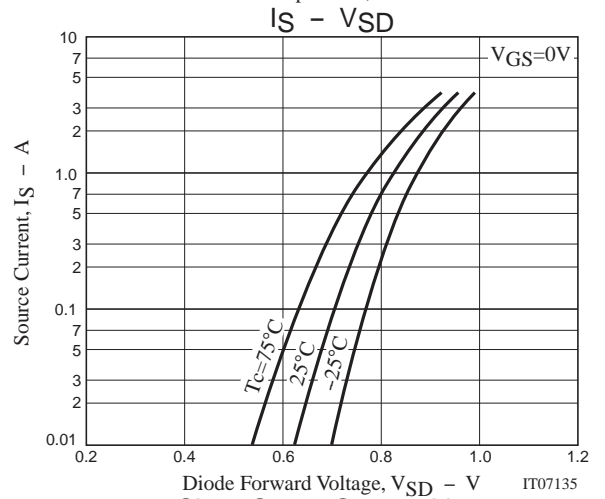
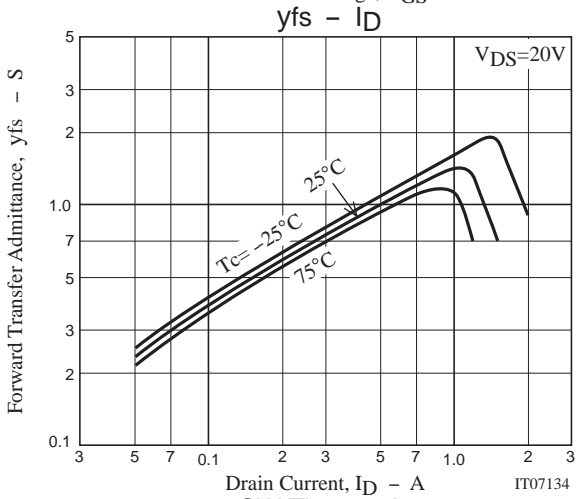
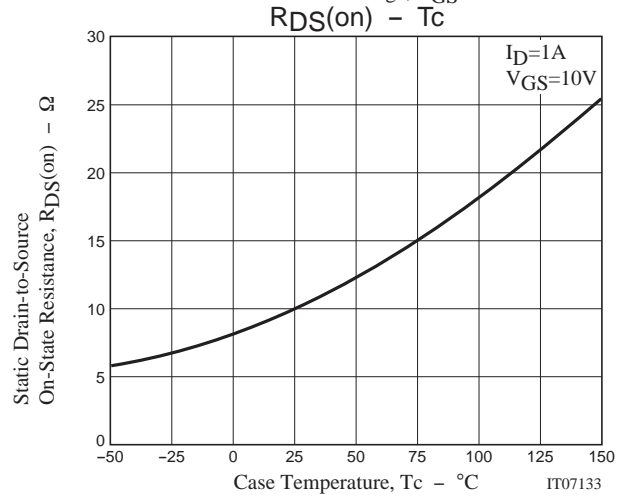
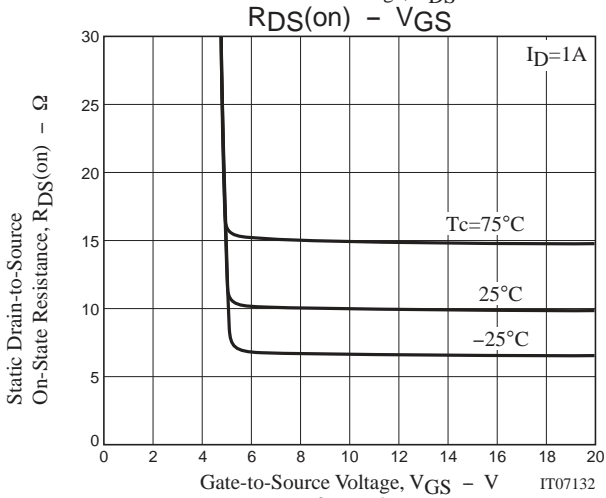
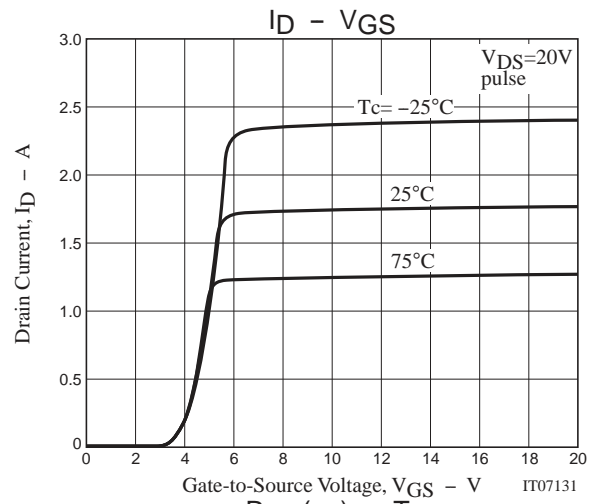
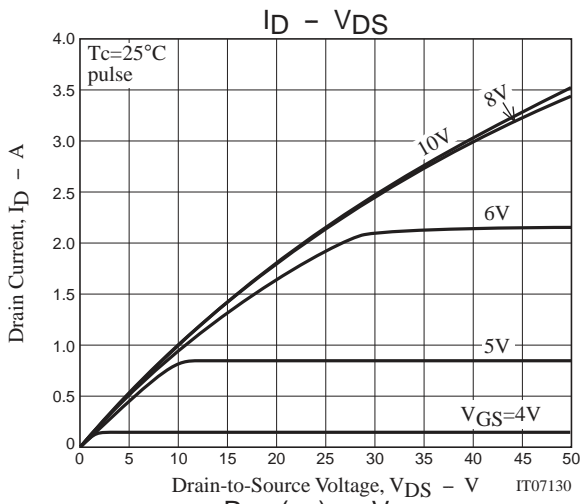


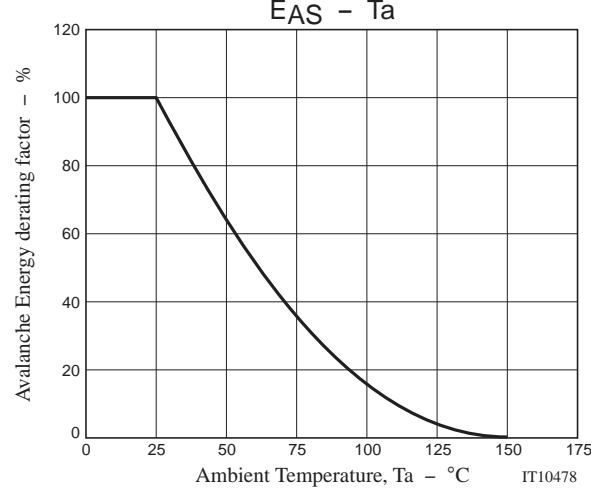
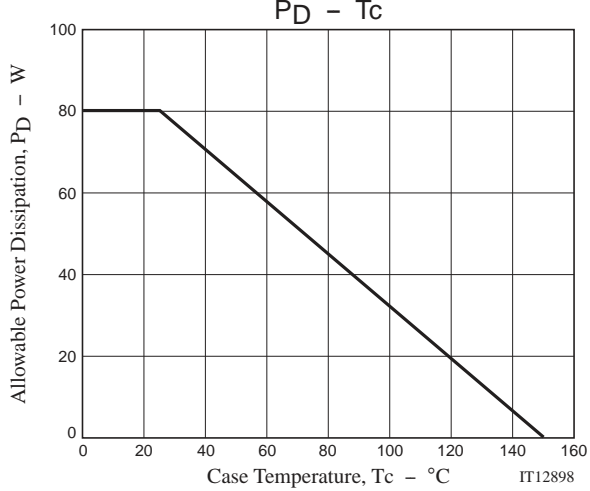
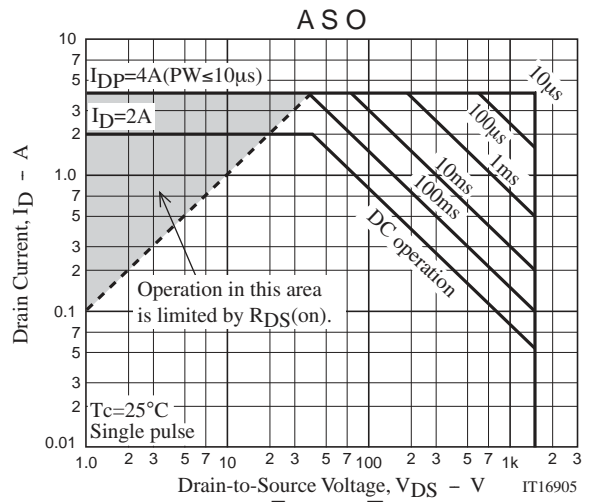
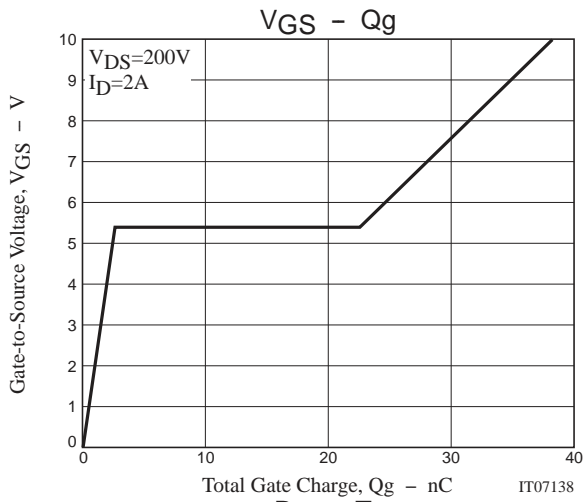
**Fig.2 Switching Time Test Circuit**



## Ordering Information

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





**Taping Specification**

2SK4177-DL-1E

1. Packing Format

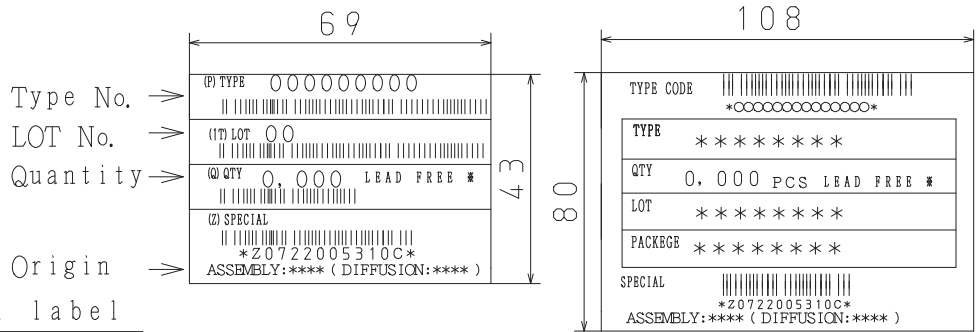
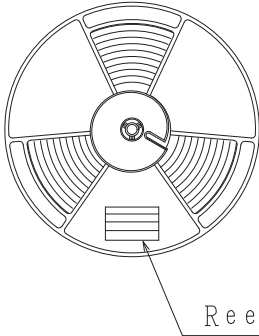
Package Name	Maximum Number of devices contained (pcs)			Packing format	
	Reel	Inner box	Outer box	Inner BOX	Outer BOX
TO-263-2L	800	1600	6400	SPD-0V0011 2 reel contained Dimensions:mm (external) 351×340×68	SPD-0V0009 4 inner boxes contained Dimensions:mm (external) 390×370×318

Reel label, Inner box label  
(unit:mm)

Outer box label

Packing method

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



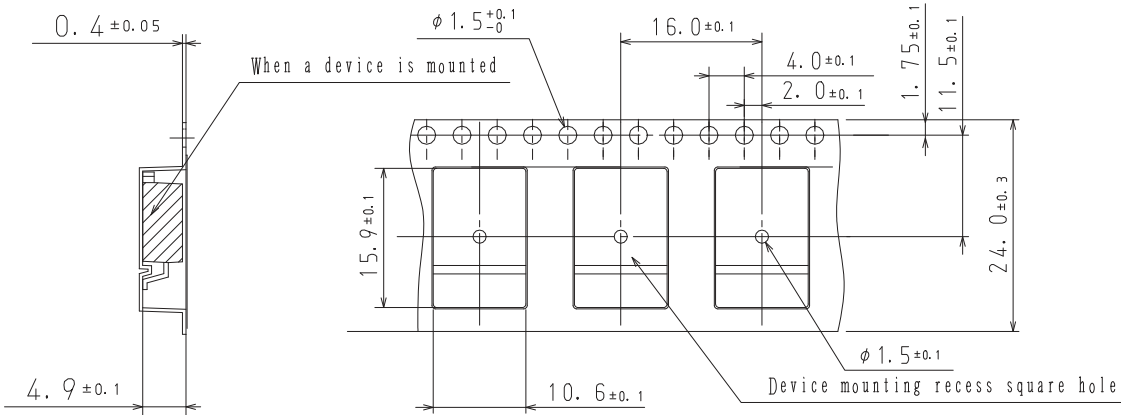
NOTE (1)

The LEAD FREE \* description shows that the surface  
treatment of the terminal is lead free.

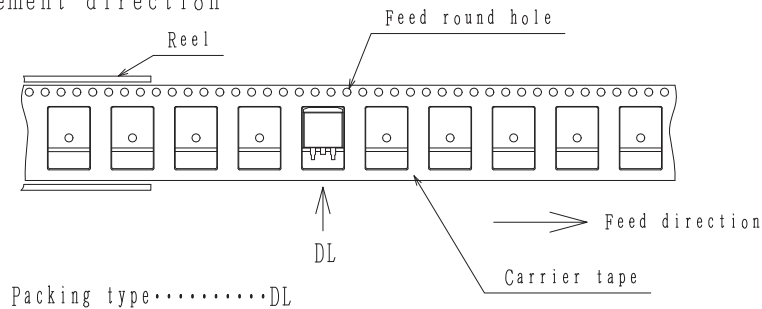
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

2. Taping configuration

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



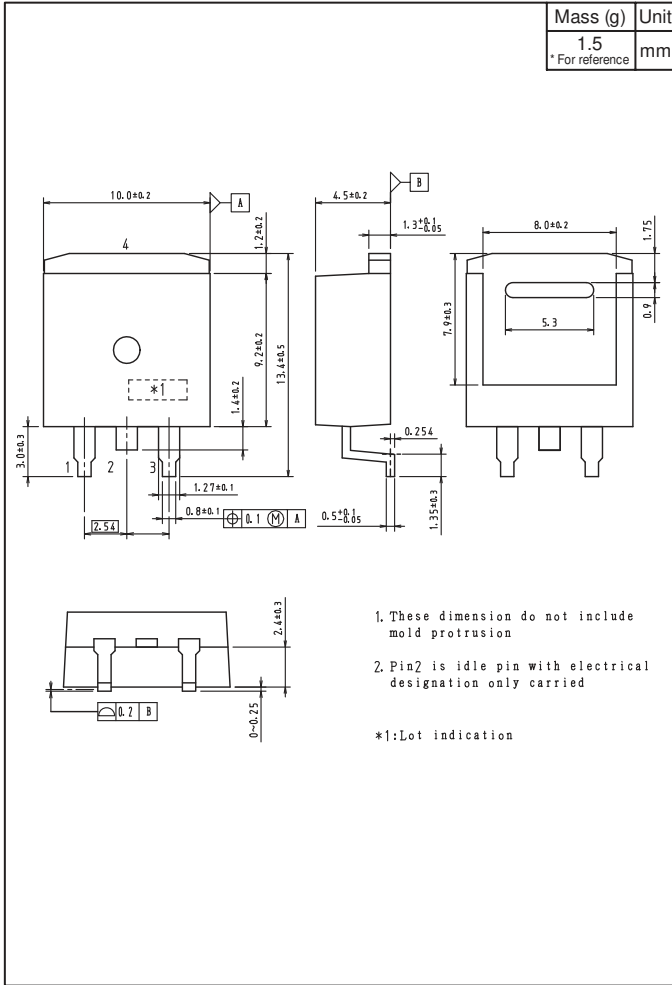
2-2. Device placement direction



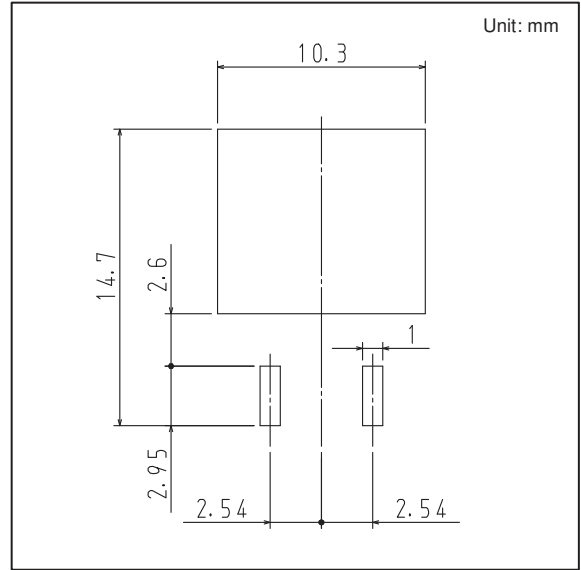
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## Outline Drawing

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.

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