

## 2SK2684(L), 2SK2684(S)

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G1022-0200  
(Previous: ADE-208-542)  
Rev.2.00  
Sep 07, 2005

### Application

High speed power switching

### Features

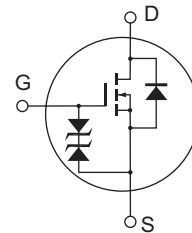
- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator, DC-DC converter

### Outline

RENESAS Package code: PRSS0004AE-A  
(Package name: LDKPAK(L))



RENESAS Package code: PRSS0004AE-B  
(Package name: LDKPAK(S)-(1))



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

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	30	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	$I_D$	30	A
Drain peak current	$I_{D(pulse)}^{*1}$	120	A
Body to drain diode reverse drain current	$I_{DR}$	30	A
Channel dissipation	$P_{ch}^{*2}$	50	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
 2. Value at  $T_c = 25^\circ C$

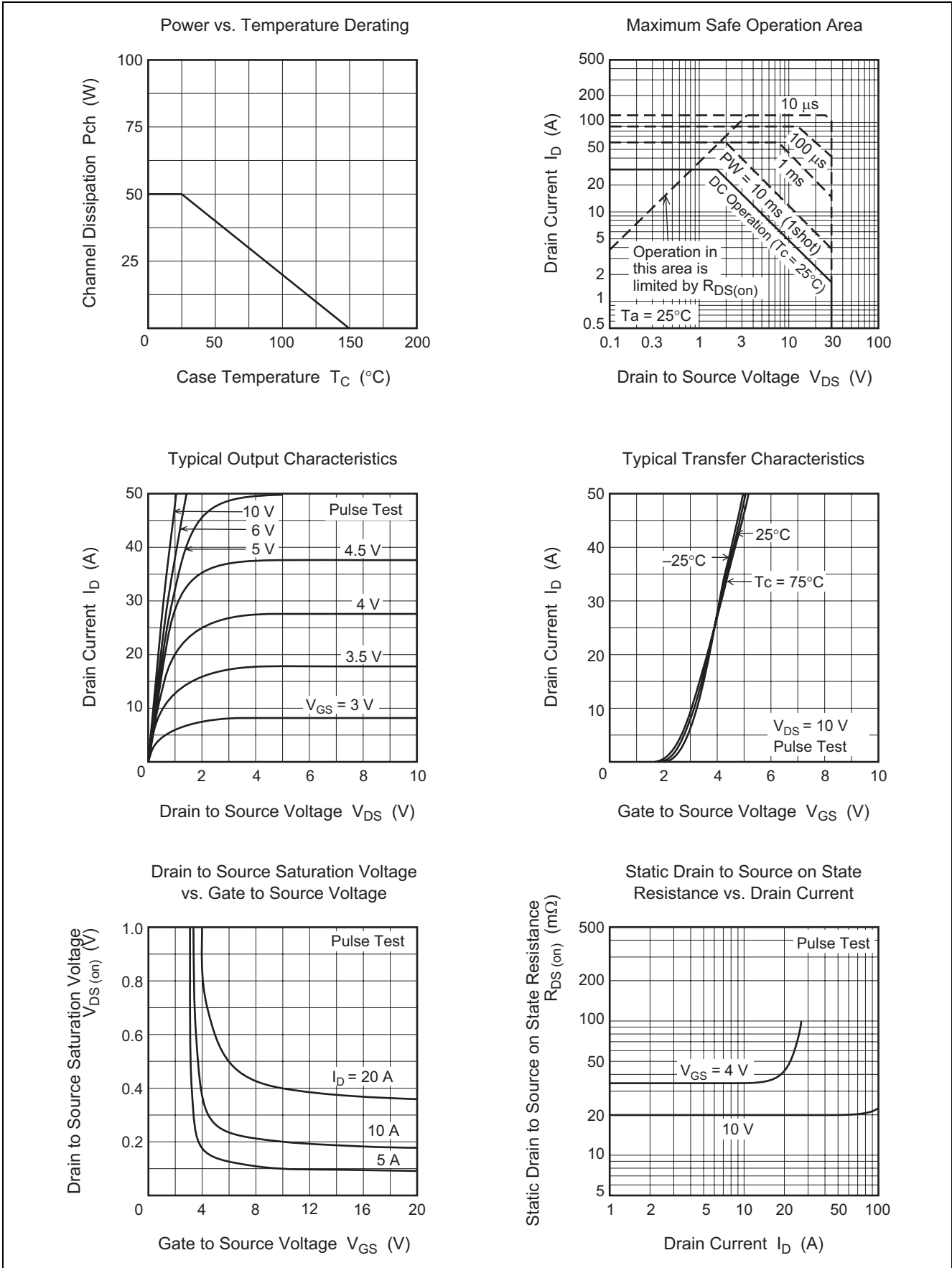
## Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	10	$\mu A$	$V_{DS} = 30 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu A$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	20	28	$m\Omega$	$I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*3}$
	$R_{DS(on)}$	—	35	50	$m\Omega$	$I_D = 15 \text{ A}$ , $V_{GS} = 4 \text{ V}^{*3}$
Forward transfer admittance	$ y_{fs} $	12	18	—	S	$I_D = 15 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*3}$
Input capacitance	$C_{iss}$	—	750	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	520	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	210	—	pF	
Turn-on delay time	$t_{d(on)}$	—	16	—	ns	$V_{GS} = 10 \text{ V}$ , $I_D = 15 \text{ A}$ , $R_L = 0.67 \Omega$
Rise time	$t_r$	—	260	—	ns	
Turn-off delay time	$t_{d(off)}$	—	85	—	ns	
Fall time	$t_f$	—	90	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.0	—	V	$I_F = 30 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	45	—	ns	$I_F = 30 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu s$

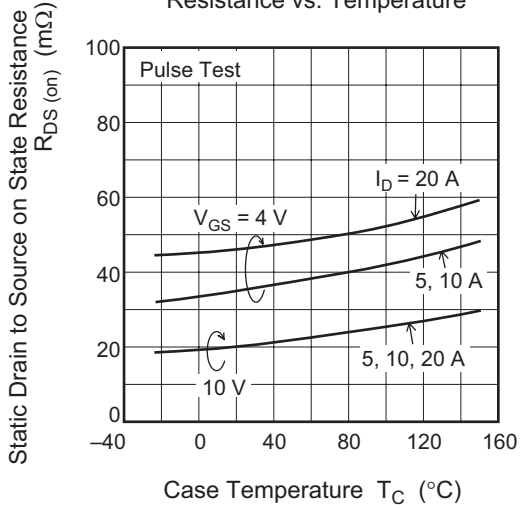
Note: 3. Pulse test

主要特性 (Main Characteristics)

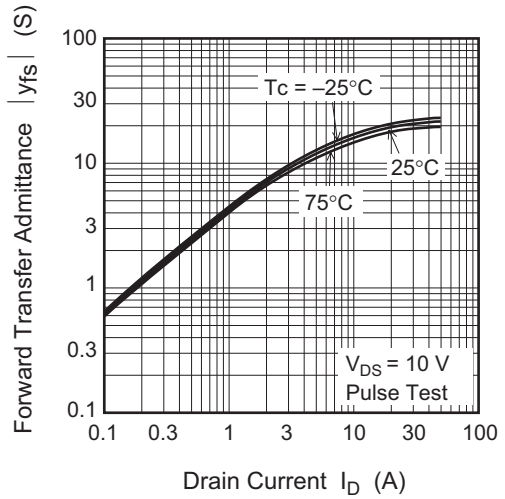


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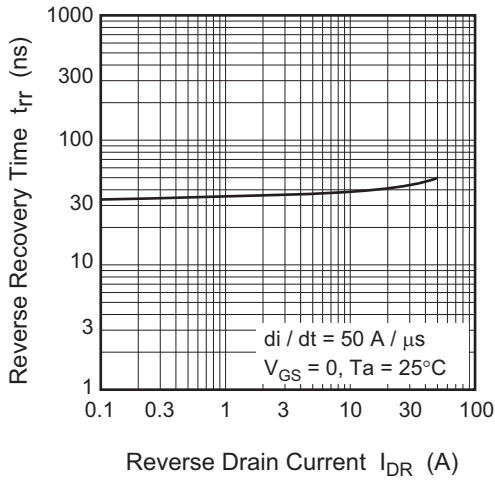
Static Drain to Source on State Resistance vs. Temperature



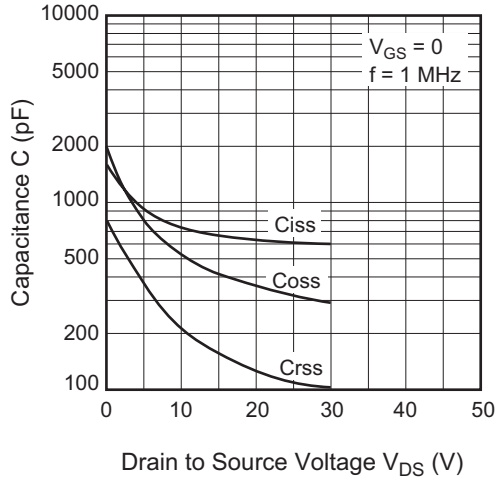
Forward Transfer Admittance vs. Drain Current



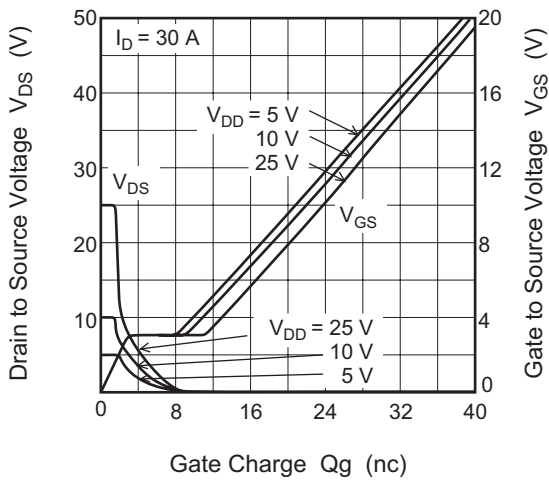
Body to Drain Diode Reverse Recovery Time



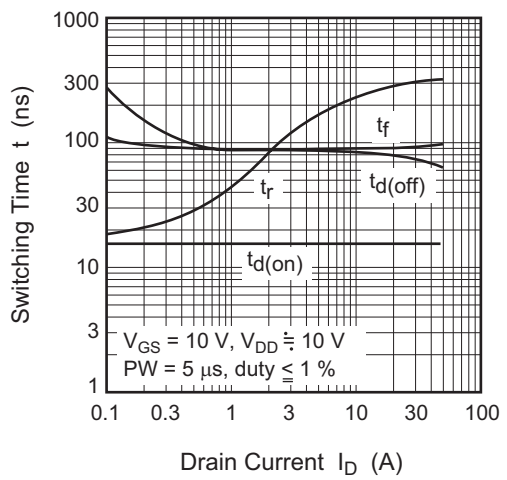
Typical Capacitance vs. Drain to Source Voltage



Dynamic Input Characteristics

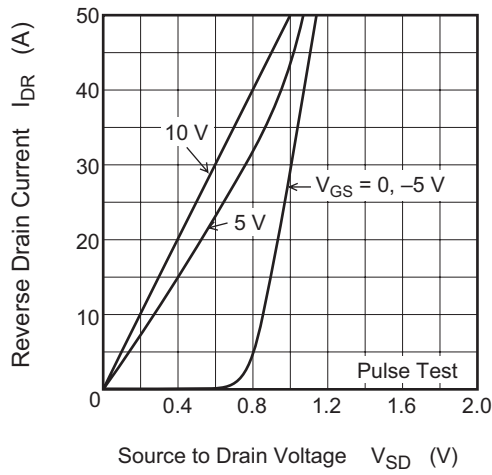


Switching Characteristics

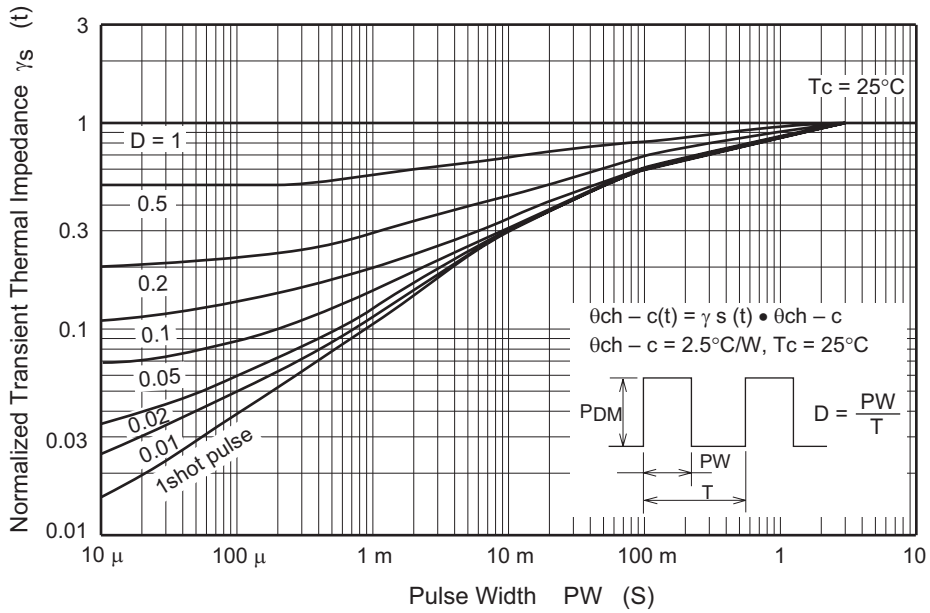


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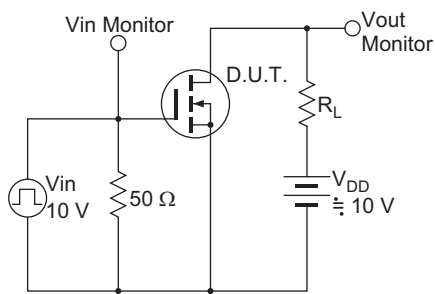
Reverse Drain Current vs. Source to Drain Voltage



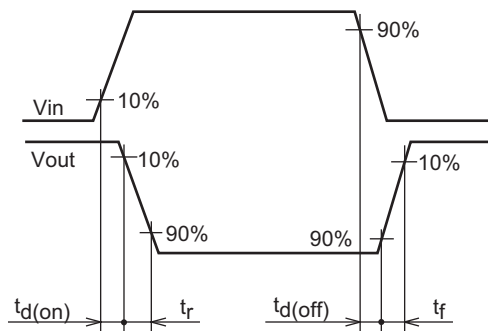
Normalized Transient Thermal Impedance vs. Pulse Width



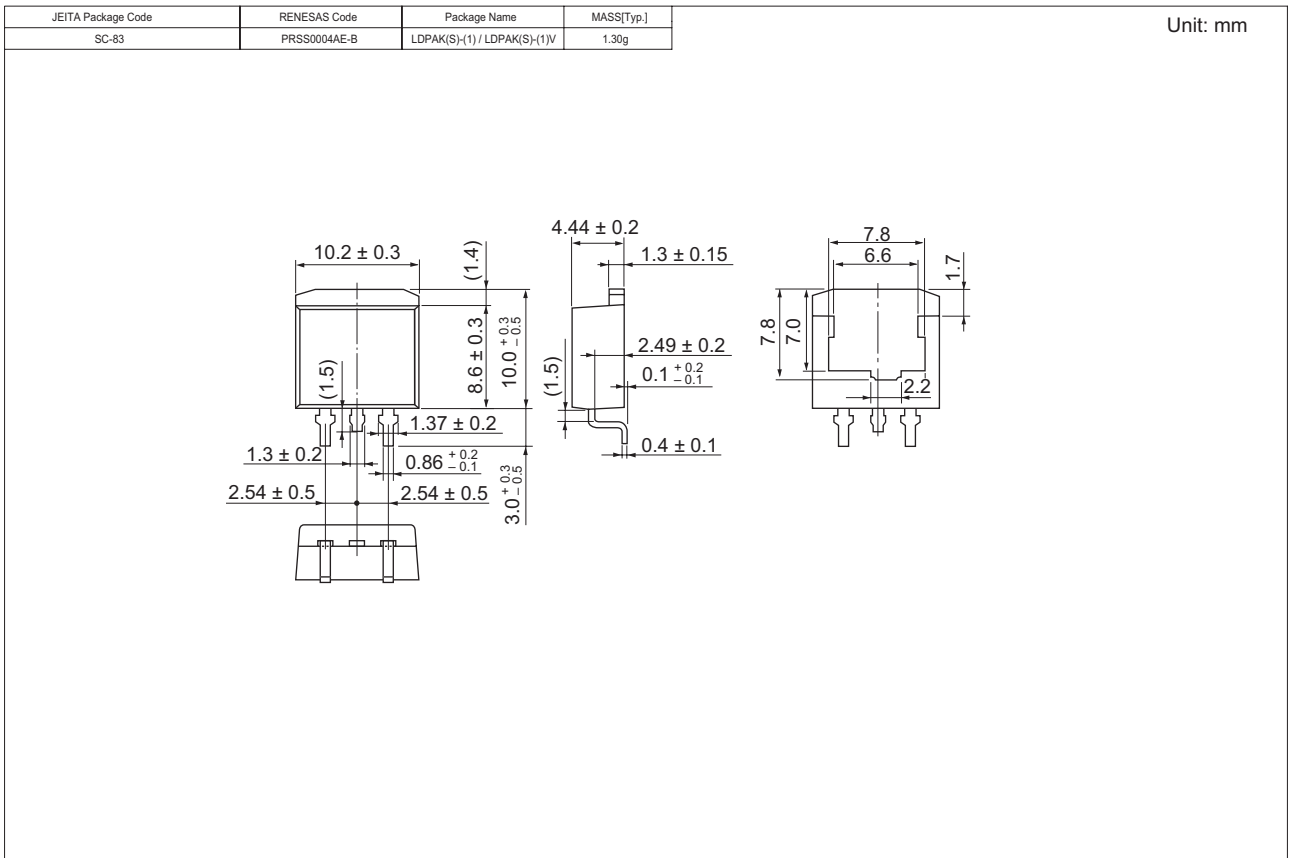
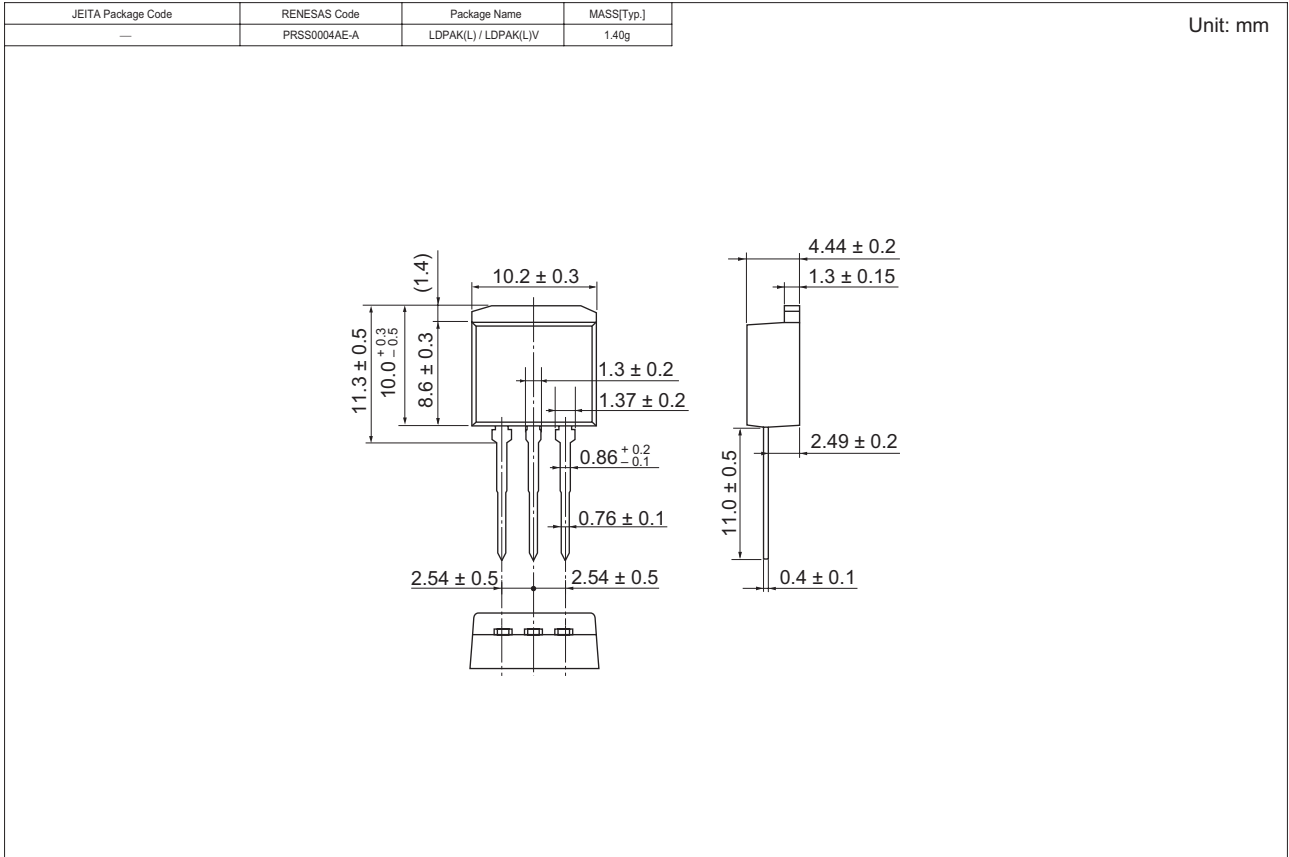
Switching Time Test Circuit



Waveform



Package Dimensions 封装尺寸



**Ordering Information**  
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Part Name	Quantity	Shipping Container
2SK2684L-E	500 pcs	Box (Sack)
2SK2684STL-E	1000 pcs	Taping

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