

2SK1254(L), 2SK1254(S)

Silicon N-Channel MOS FET

HITACHI

ADE-208-1255 (Z)

1st. Edition

Mar. 2001

Application

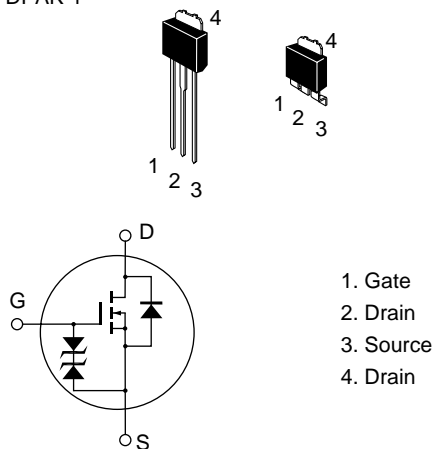
High speed power switching

Features

- Low on-resistance
- High speed switching
- 4 V gate drive device
 - Can be driven from 5 V source
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive

Outline

DPAK-1



2SK1254(L), 2SK1254(S)

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	120	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	3	A
Drain peak current	$I_{D(pulse)}^{*1}$	12	A
Body to drain diode reverse drain current	I_{DR}	3	A
Channel dissipation	Pch^{*2}	20	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

Notes: 1. PW 10 μs, duty cycle 1%

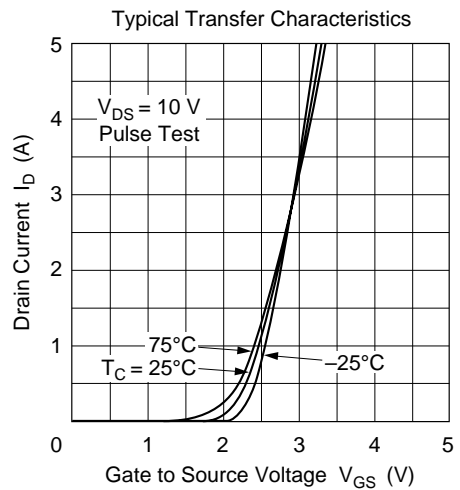
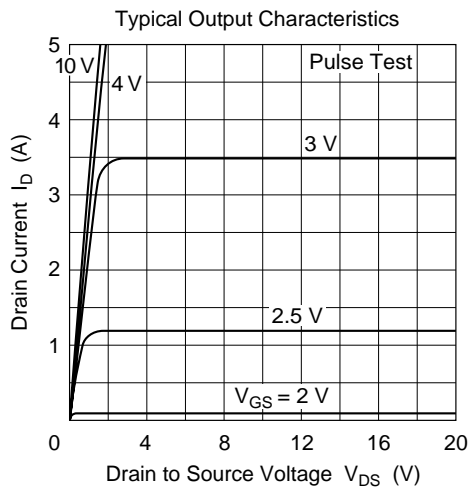
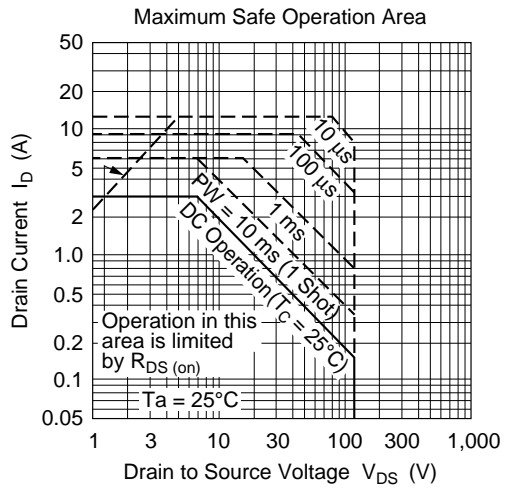
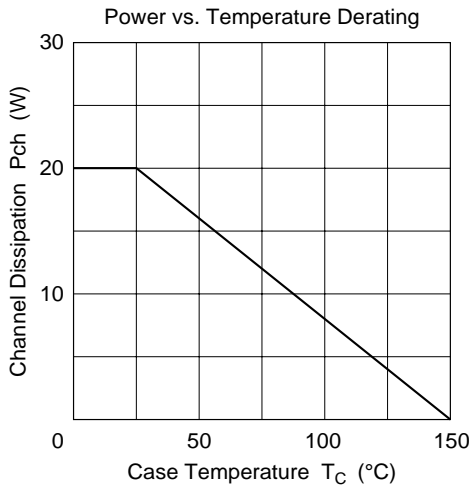
2. Value at T_c = 25°C

Electrical Characteristics (Ta = 25°C)

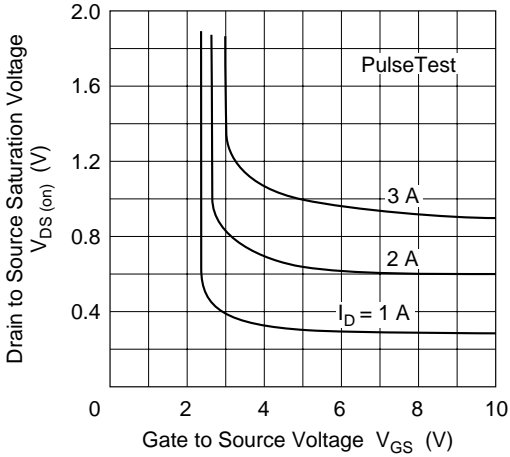
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	120	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	100	μA	$V_{DS} = 100 \text{ V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	0.30	0.40		$I_D = 2 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
		—	0.35	0.55		$I_D = 2 \text{ A}, V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	2.4	4.0	—	S	$I_D = 2 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	C_{iss}	—	420	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance	C_{oss}	—	190	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	C_{rss}	—	25	—	pF	
Turn-on delay time	$t_{d(on)}$	—	5	—	ns	$I_D = 2 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time	t_r	—	20	—	ns	$R_L = 15$
Turn-off delay time	$t_{d(off)}$	—	150	—	ns	
Fall time	t_f	—	45	—	ns	
Body to drain diode forward voltage	V_{DF}	—	0.95	—	V	$I_F = 3 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	160	—	ns	$I_F = 3 \text{ A}, V_{GS} = 0,$ $di_F/dt = 50 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

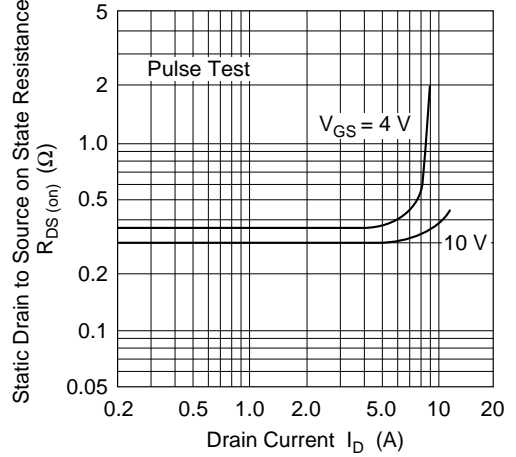
2SK1254(L), 2SK1254(S)



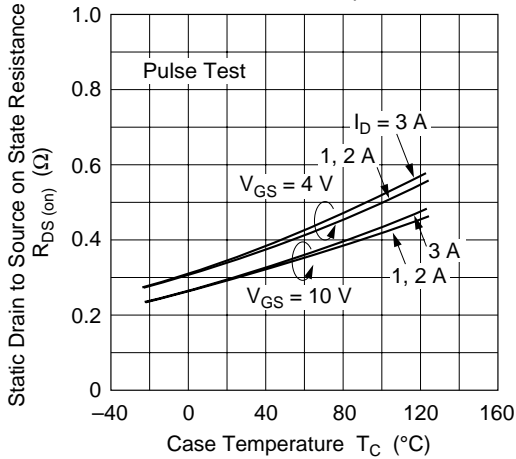
Drain to Source Saturation Voltage vs. Gate to Source Voltage



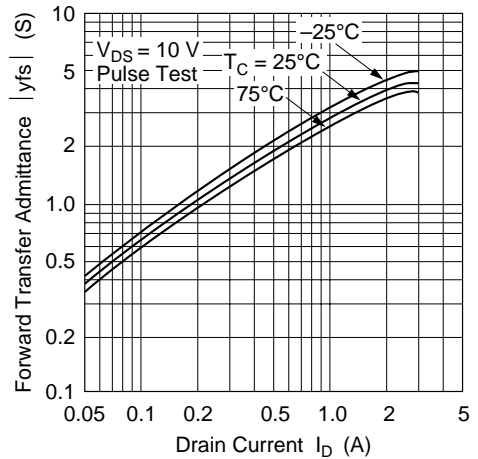
Static Drain to Source on State Resistance vs. Drain Current



Static Drain to Source on State Resistance vs. Temperature

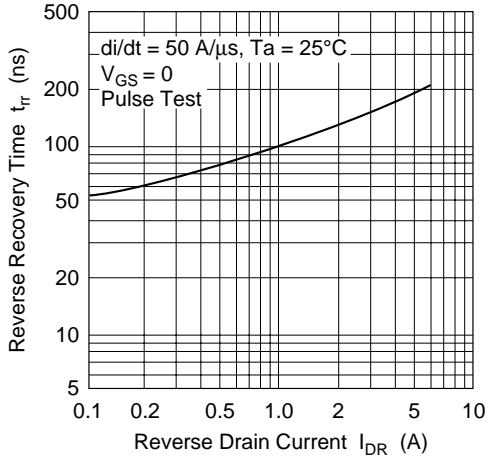


Forward Transfer Admittance vs. Drain Current

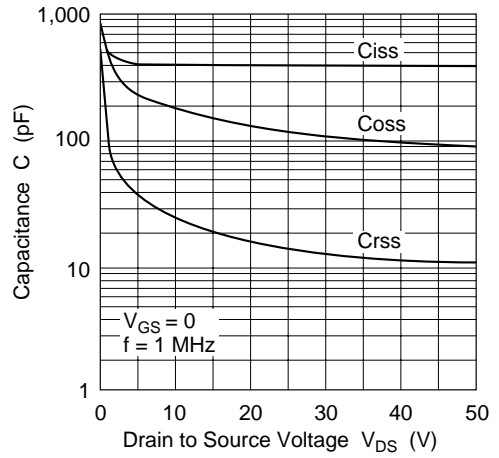


2SK1254(L), 2SK1254(S)

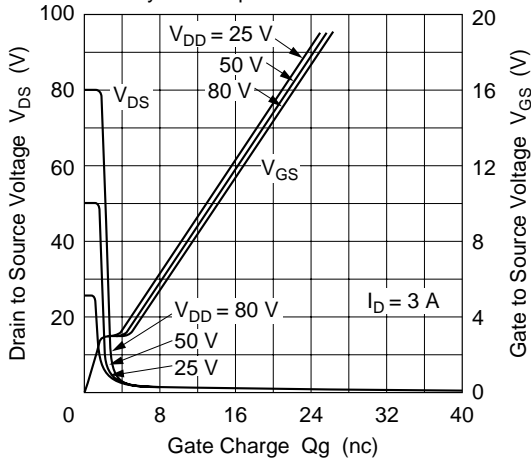
Body to Drain Diode Reverse Recovery Time



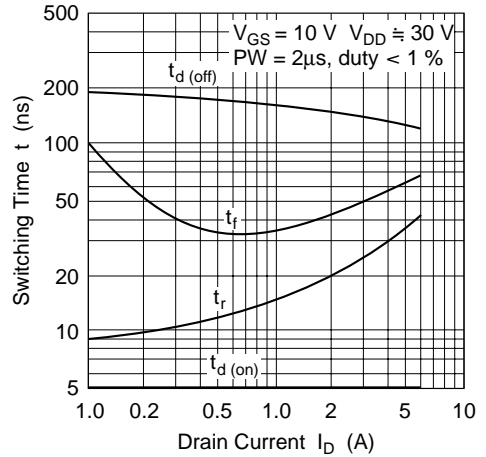
Typical Capacitance vs. Drain to Source Voltage

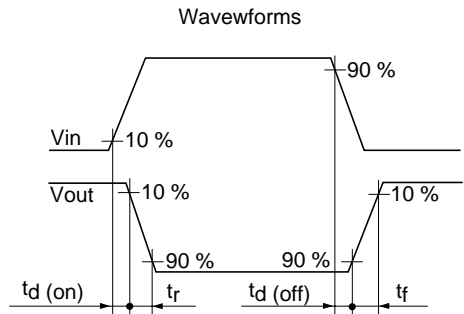
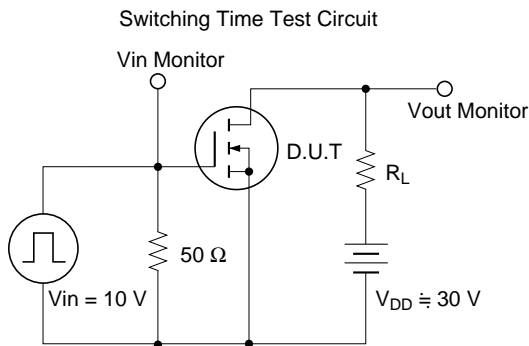
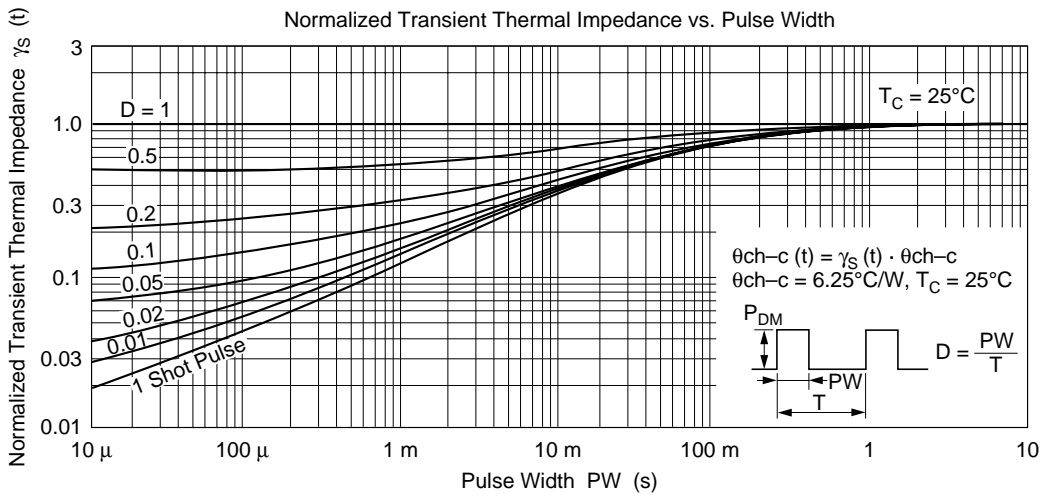
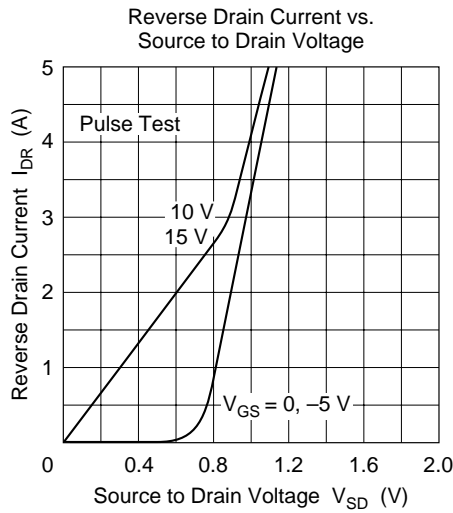


Dynamic Input Characteristics



Switching Characteristics



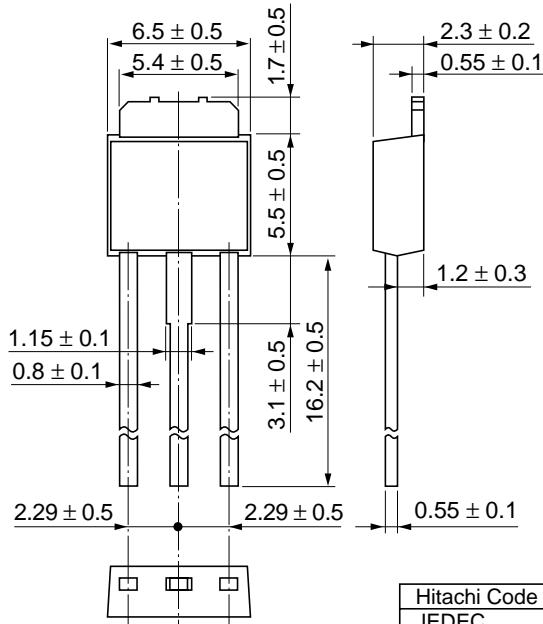


2SK1254(L), 2SK1254(S)

Package Dimensions

As of January, 2001

Unit: mm

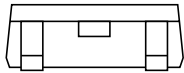
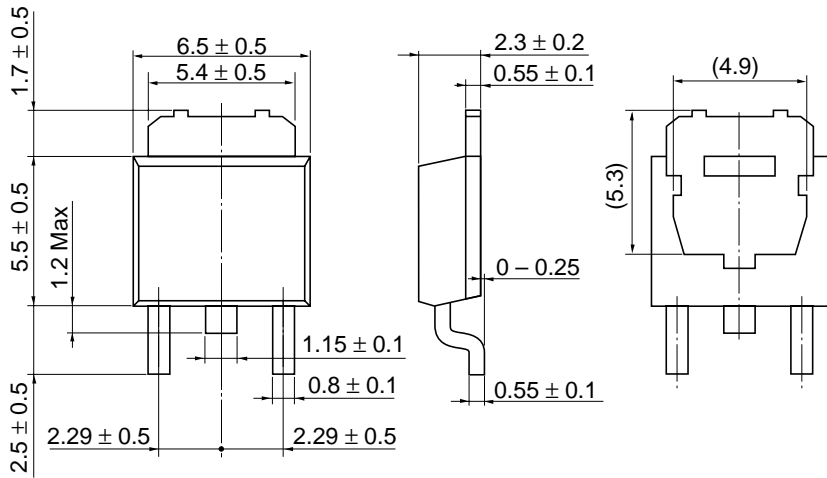


Hitachi Code	DPAK (L)-(1)
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.42 g

2SK1254(L), 2SK1254(S)

As of January, 2001

Unit: mm

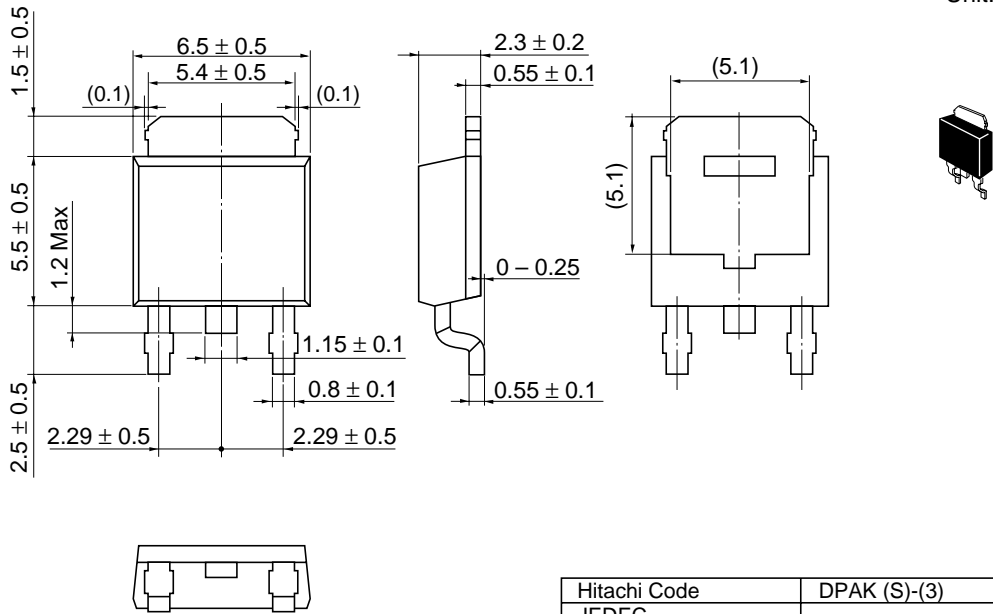


Hitachi Code	DPAK (S)-(1),(2)
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.28 g

2SK1254(L), 2SK1254(S)

As of January, 2001

Unit: mm



Hitachi Code	DPAK (S)-(3)
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.28 g

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