H5N5004PL

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

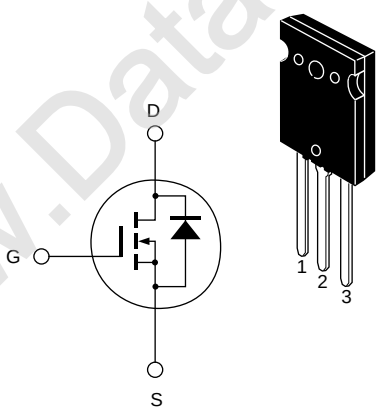
ADE-208-1381 (Z)
Target Specification 1st. Edition
Mar. 2001

Features

- Low on-resistance: $R_{DS(on)}$ = 0.09 typ.
- Low leakage current: IDSS = 10 µA max (at VDS = 500 V)
- High speed switching: tf = 280 ns typ (at VGS = 10 V, VDD = 250 V, ID = 25 A)
- Low gate charge: Qg = 220 nC typ (at VDD = 400 V, VGS = 10 V, ID = 50 A)
- Avalanche ratings
- Built-in fast recovery diode: trr = 190 ns typ

Outline

TO-3PL



1. Gate
2. Drain (Flange)
3. Source

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Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	500	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	50	A
Drain peak current	$I_{D\ (pulse)}$ Note1	200	A
Body-drain diode reverse drain current	I_{DR}	50	A
Body-drain diode reverse drain peak current	$I_{DR\ (pulse)}$ Note1	200	A
Avalanche current	I_{AP} Note3	15	A
Channel dissipation	Pch Note2	250	W
Channel to case Thermal Impedance	θ ch-c	0.5	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW 10 µs, duty cycle 1%
2. Value at Tc = 25°C
3. Tch 150°C

Electrical Characteristics (Ta = 25°C)

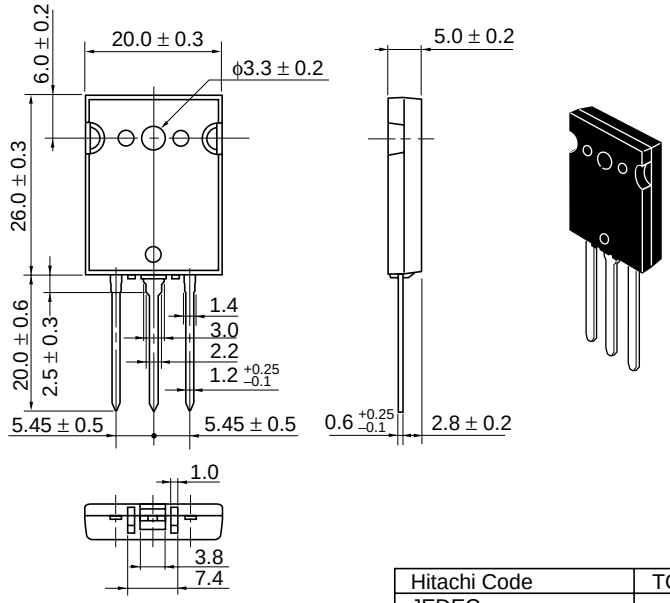
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±30 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 500 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	4.0	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	0.09	0.11		I_D = 25 A, V_{GS} = 10 V [Note4]
Forward transfer admittance	$\|y_{fs}\|$	27	45	—	S	I_D = 25 A, V_{DS} = 10 V [Note4]
Input capacitance	Ciss	—	7630	—	pF	V_{DS} = 25 V
Output capacitance	Coss	—	770	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	160	—	pF	f = 1 MHz
Turn-on delay time	td(on)	—	90	—	ns	I_D = 25 A
Rise time	tr	—	340	—	ns	V_{GS} = 10 V
Turn-off delay time	td(off)	—	370	—	ns	R_L = 10
Fall time	tf	—	280	—	ns	Rg = 10
Total gate charge	Qg	—	220	—	nC	V_{DD} = 400 V
Gate to source charge	Qgs	—	30	—	nC	V_{GS} = 10 V
Gate to drain charge	Qgd	—	110	—	nC	I_D = 50 A
Body-drain diode forward voltage	V_{DF}	—	0.98	1.5	V	I_F = 50 A, V_{GS} = 0
Body-drain diode reverse recovery time	trr	—	190	—	ns	I_F = 50 A, V_{GS} = 0
Body-drain diode reverse recovery charge	Qrr	—	1.3	—	µC	diF/dt = 100 A/µs

Note: 4. Pulse test

Package Dimensions

As of January, 2001

Unit: mm



Hitachi Code	TO-3PL
JEDEC	—
EIAJ	—
Mass (reference value)	9.9 g

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