Silicon P-Channel MOS FET

HITACHI

November 1996

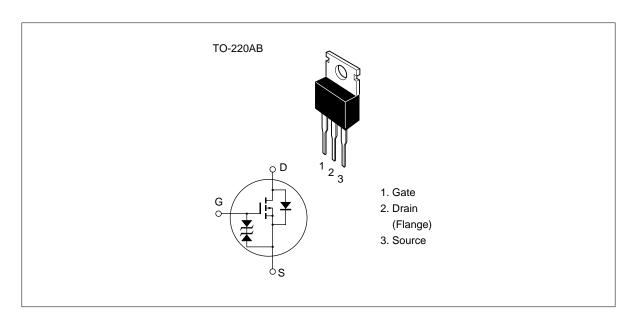
Application

High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- 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



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{\scriptscriptstyle DSS}$	-60	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I _D	-10	A
Drain peak current	I _{D(pulse)} *1	-40	A
Body to drain diode reverse drain current	I _{DR}	-10	A
Channel dissipation	Pch*2	40	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

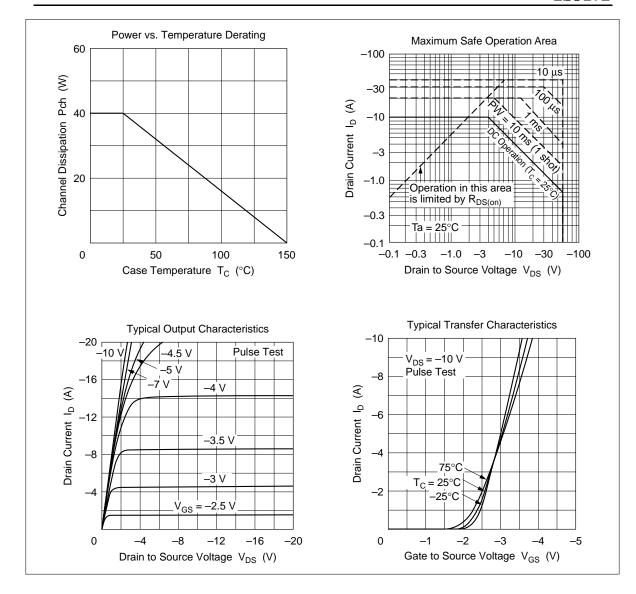
Notes 1. PW \leq 10 μ s, duty cycle \leq 1%

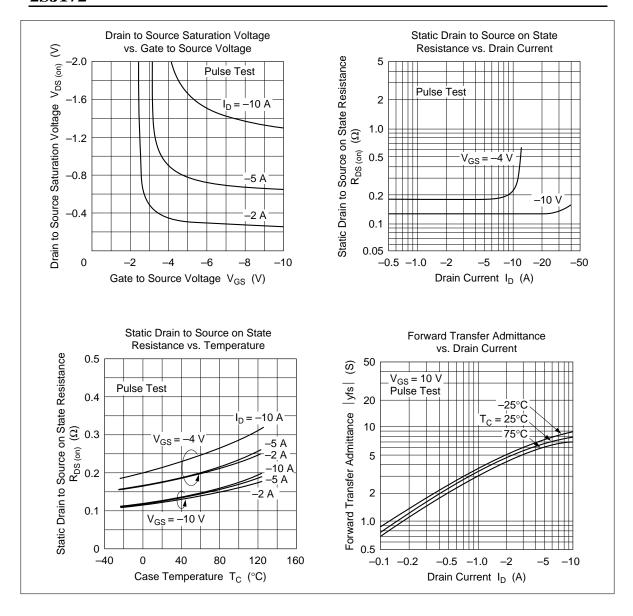
2. Value at $T_c = 25^{\circ}C$

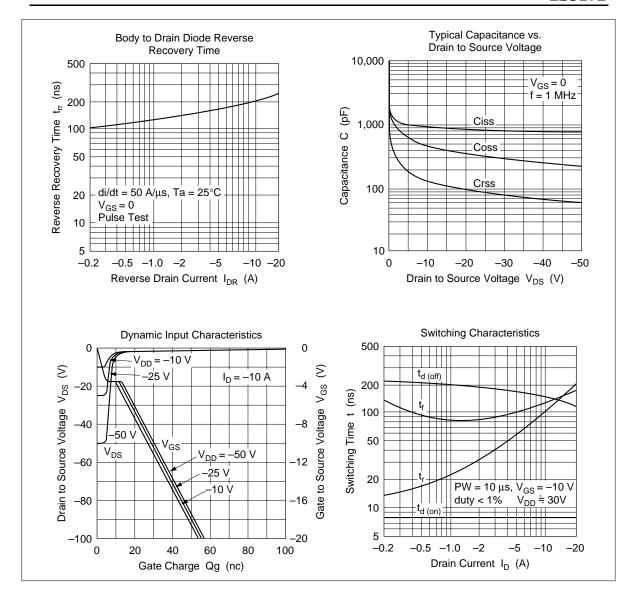
Electrical Characteristics (Ta = 25°C)

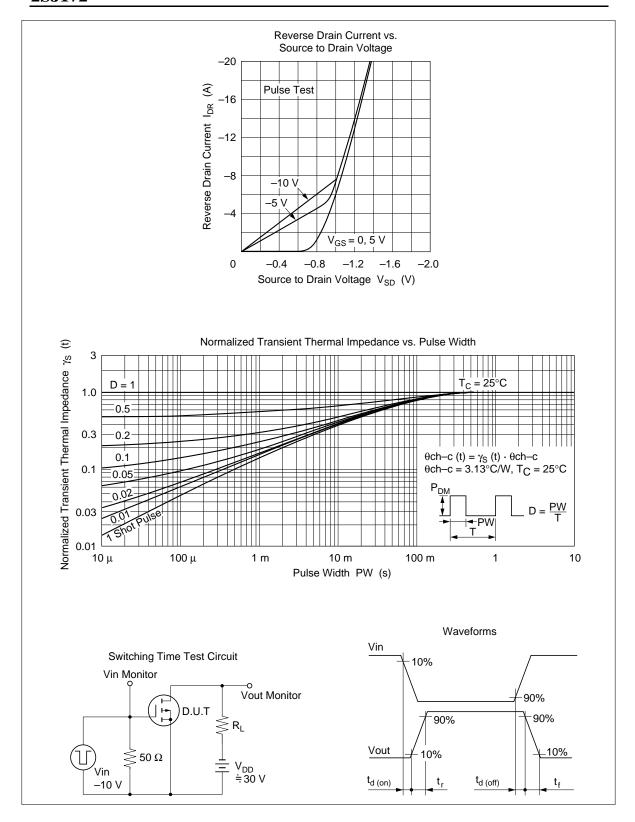
Item	Symbol	Min	Тур	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	_	_	V	$I_{D} = -10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	_	_	V	$I_{G} = \pm 100 \ \mu A, \ V_{DS} = 0$
Gate to source leak current	I _{GSS}	_	_	±10	μΑ	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	I _{DSS}	_	_	250	μΑ	$V_{DS} = -50 \text{ V}, V_{GS} = 0$
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	R _{DS(on)}	_	0.13	0.18	Ω	$I_D = -5 \text{ A}, V_{GS} = -10 \text{ V}^{*1}$
resistance		_	0.18	0.25	_	$I_D = -5 \text{ A}, V_{GS} = -4 \text{ V}^{*1}$
Forward transfer admittance	y _{fs}	4.0	6.5	_	S	$I_D = -5 \text{ A}, V_{DS} = -10 \text{ V}^{*1}$
Input capacitance	Ciss	_	900	_	pF	$V_{DS} = -10 \text{ V}, V_{GS} = 0,$
Output capacitance	Coss	_	460	_	pF	f = 1 MHz
Reverse transfer capacitance	Crss	_	130	_	pF	_
Turn-on delay time	t _{d(on)}	_	8	_	ns	$I_D = -5 \text{ A}, V_{GS} = -10 \text{ V},$
Rise time	t _r	_	65	_	ns	$R_L = 6 \Omega$
Turn-off delay time	t _{d(off)}	_	170		ns	_
Fall time	t _f	_	105	_	ns	_
Body to drain diode forward voltage	V_{DF}	_	-1.1	_	V	$I_F = -10 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	t _{rr}		200		ns	$I_F = -10 \text{ A}, V_{GS} = 0,$ $di_F/dt = 50 \text{ A}/\mu\text{s}$

Note 1. Pulse test









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