

6AM15

Silicon N/P Channel MOS FET
High Speed Power Switching

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ADE-208-719 (Z)

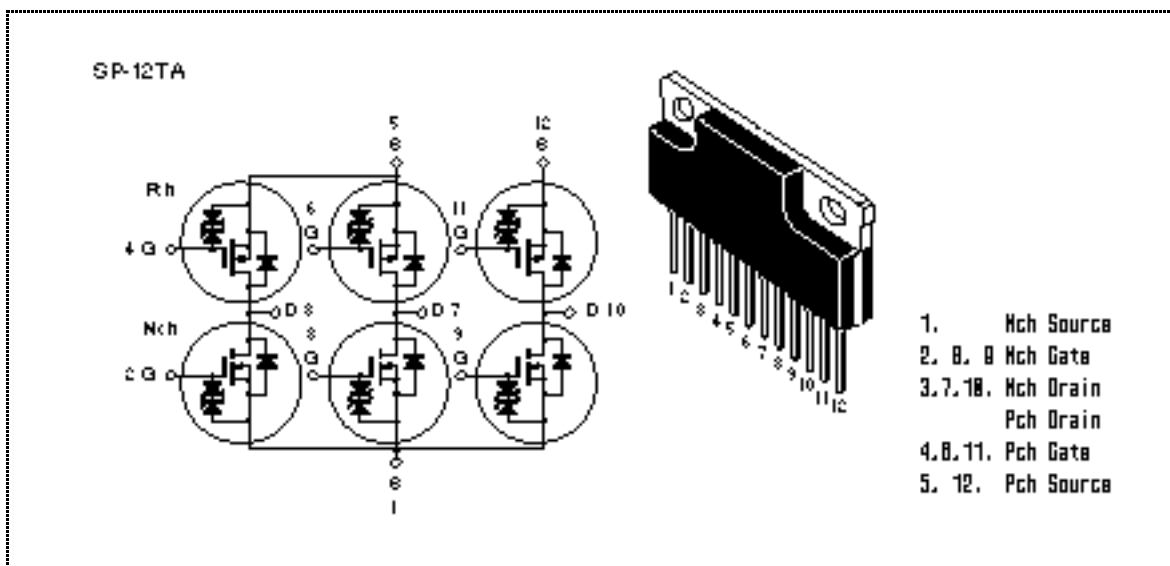
1st. Edition

February 1999

Features

- Low on-resistance
N Channel : $R_{DS(on)} = 0.045$ typ.
P Channel : $R_{DS(on)} = 0.085$ typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source
- High density mounting

Outline



6AM15

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings		Unit
		Nch	Pch	
Drain to source voltage	V_{DSS}	60	-60	V
Gate to source voltage	V_{GSS}	±20	±20	V
Drain current	I_D	10	-10	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	40	-40	A
Body-drain diode reverse drain current	I_{DR}	10	-10	A
Avalanche current	I_{AP} ^{Note3}	10	-10	A
Avalanche energy	E_{AR} ^{Note3}		8.5	mJ
Channel dissipation	Pch (Tc = 25°C) Note2		42	W
Channel dissipation	Pch ^{Note2}		4.8	W
Channel temperature	Tch		150	°C
Storage temperature	Tstg		-55 to +150	°C

Note: 1. PW 10 μs, duty cycle 1%

2. 6 Devices operation

3. Value at Ta = 25°C, Rg 50

Electrical Characteristics (N Channel) (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DS}$	60	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GS}$	±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}	—	—	10	μA	$V_{DS} = 60 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	2.5	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Static drain to source on state	$R_{DS(on)}$	—	0.045	0.060		$I_D = 5 \text{ A}$, $V_{GS} = 10 \text{ V}$ Note5
resistance	$R_{DS(on)}$	—	0.070	0.115		$I_D = 5 \text{ A}$, $V_{GS} = 4 \text{ V}$ Note5
Forward transfer admittance	$ y_{fs} $	5.5	9	—	S	$I_D = 5 \text{ A}$, $V_{DS} = 10 \text{ V}$ Note5
Input capacitance	C_{iss}	—	500	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	260	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	110	—	pF	f = 1 MHz
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 5 \text{ A}$

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Rise time	t_r	—	50	—	ns	$R_L = 6$
Turn-off delay time	$t_{d(off)}$	—	90	—	ns	
Fall time	t_f	—	100	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.9	—	V	$I_F = 10\text{ A}, V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	52	—	ns	$I_F = 10\text{ A}, V_{GS} = 0$ $diF/dt = 50\text{ A}/\mu\text{s}$

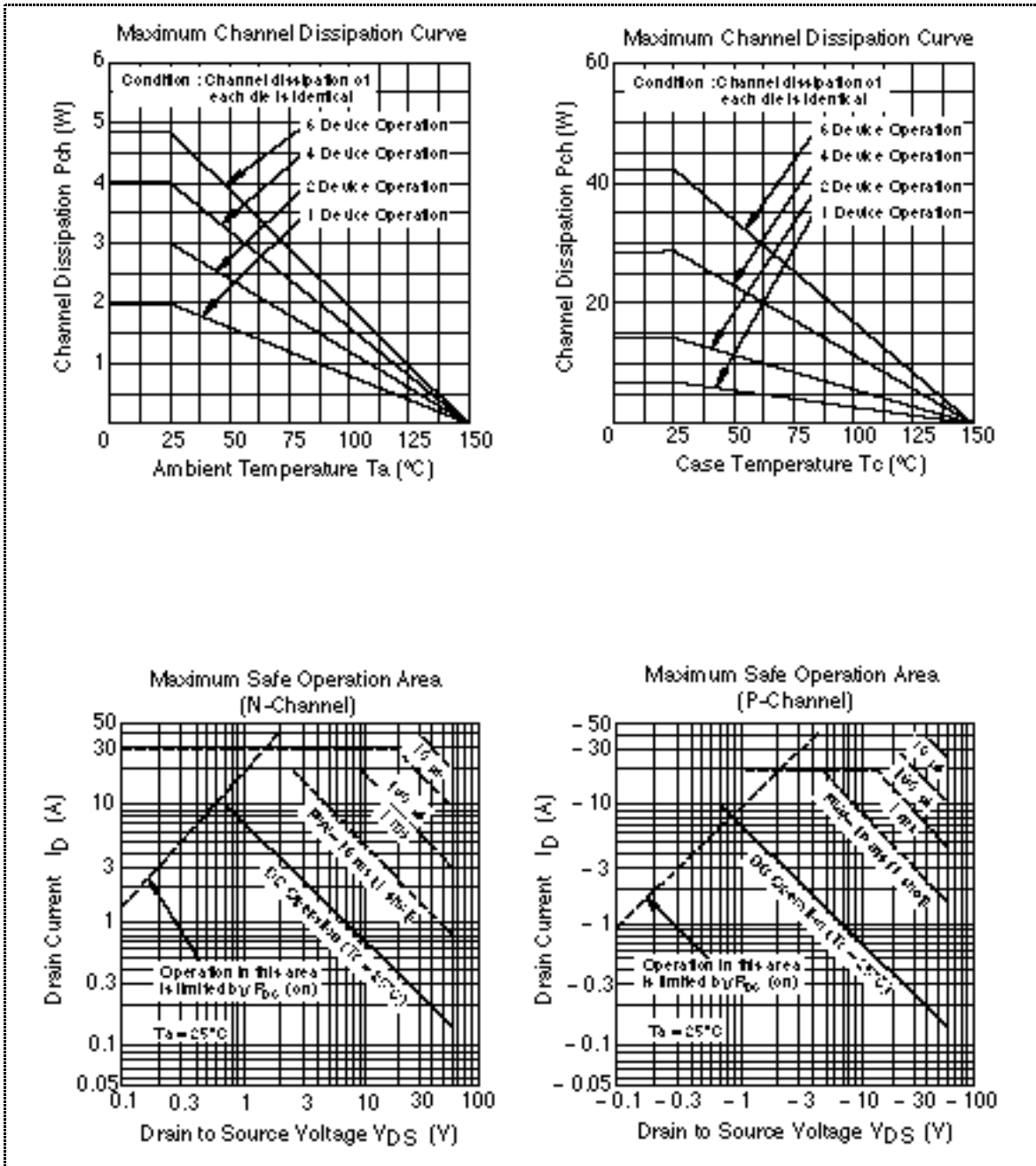
Note: 5. Pulse test

Electrical Characteristics (P Channel) ($T_a = 25^\circ\text{C}$)

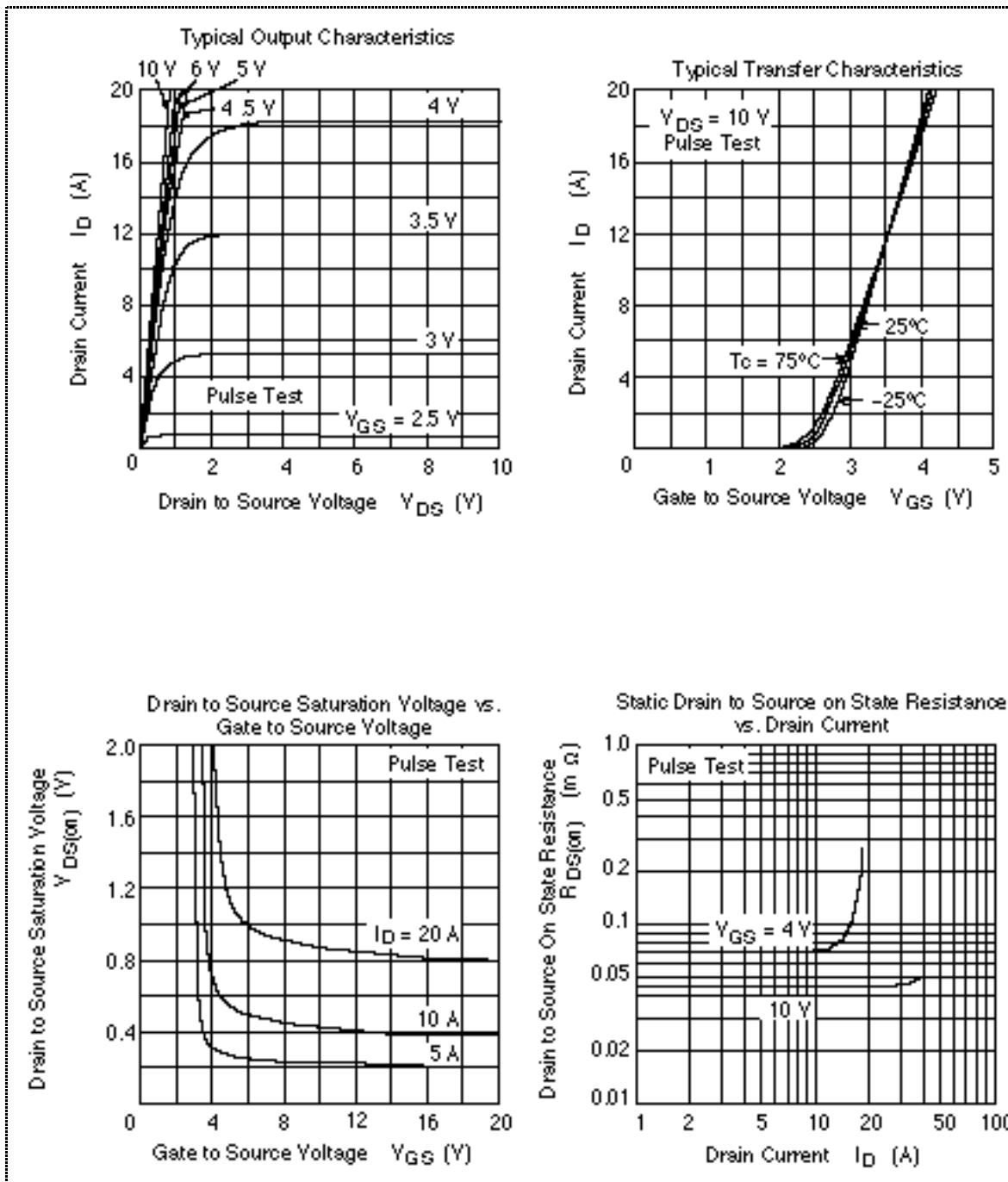
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DS}$	-60	—	—	V	$I_D = -10\text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GS}$	± 20	—	—	V	$I_G = \pm 100\text{ }\mu\text{A}, V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	-10	μA	$V_{DS} = -60\text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.0	V	$V_{DS} = -10\text{ V}, I_D = -1\text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.085	0.105		$I_D = -5\text{ A}, V_{GS} = -10\text{ V}$ Note5
	$R_{DS(on)}$	—	0.115	0.165		$I_D = -5\text{ A}, V_{GS} = -4\text{ V}$ Note5
Forward transfer admittance	$ y_{fs} $	5.5	9	—	S	$I_D = -5\text{ A}, V_{DS} = -10\text{ V}$ Note5
Input capacitance	C_{iss}	—	850	—	pF	$V_{DS} = -10\text{ V}$
Output capacitance	C_{oss}	—	420	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	110	—	pF	$f = 1\text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	12	—	ns	$V_{GS} = -10\text{ V}, I_D = -5\text{ A}$
Rise time	t_r	—	55	—	ns	$R_L = 6$
Turn-off delay time	$t_{d(off)}$	—	130	—	ns	
Fall time	t_f	—	70	—	ns	
Body-drain diode forward voltage	V_{DF}	—	-0.95	—	V	$I_F = -10\text{ A}, V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	65	—	ns	$I_F = -10\text{ A}, V_{GS} = 0$ $diF/dt = 50\text{ A}/\mu\text{s}$

Note: 5. Pulse test

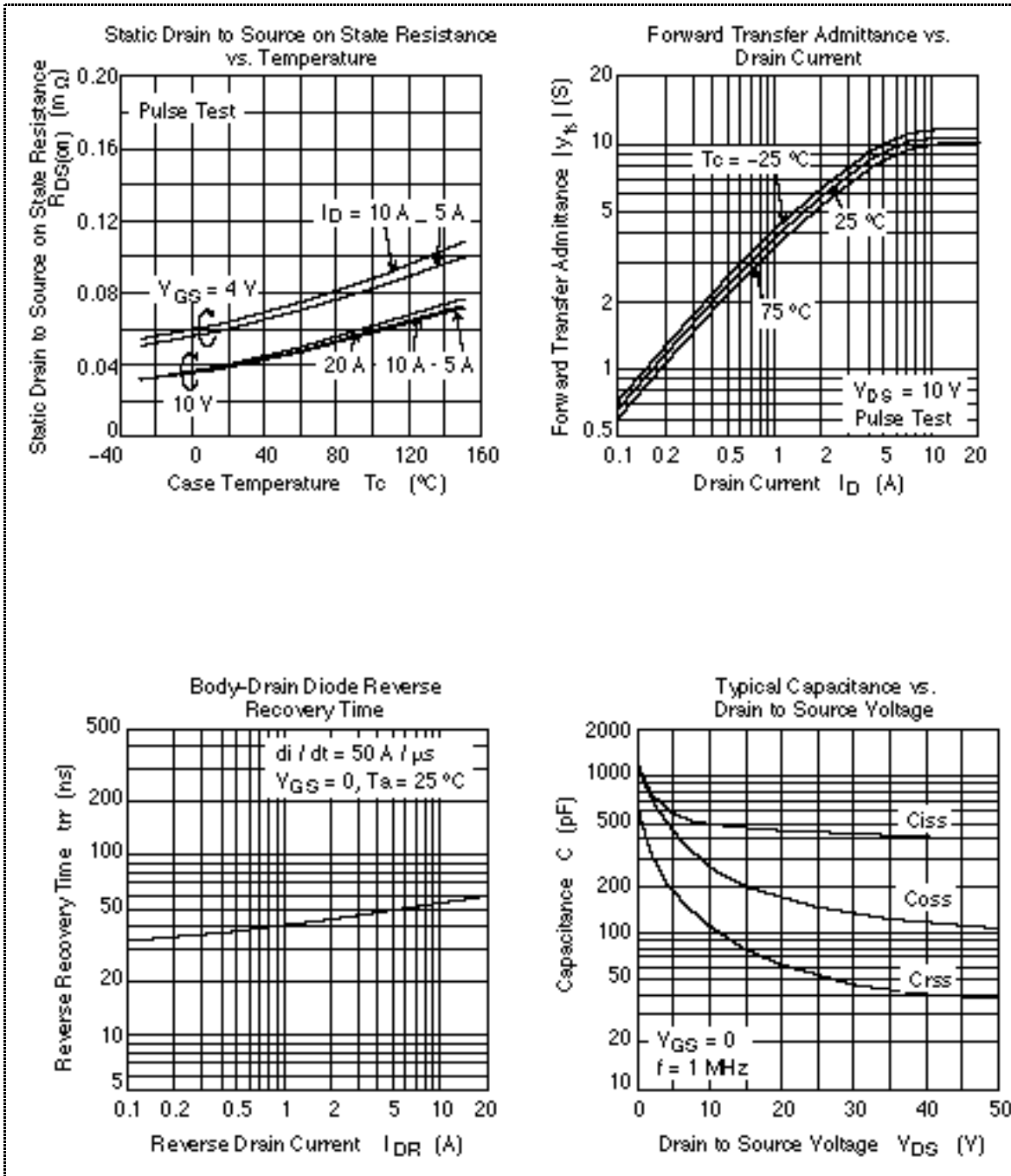
Main Characteristics



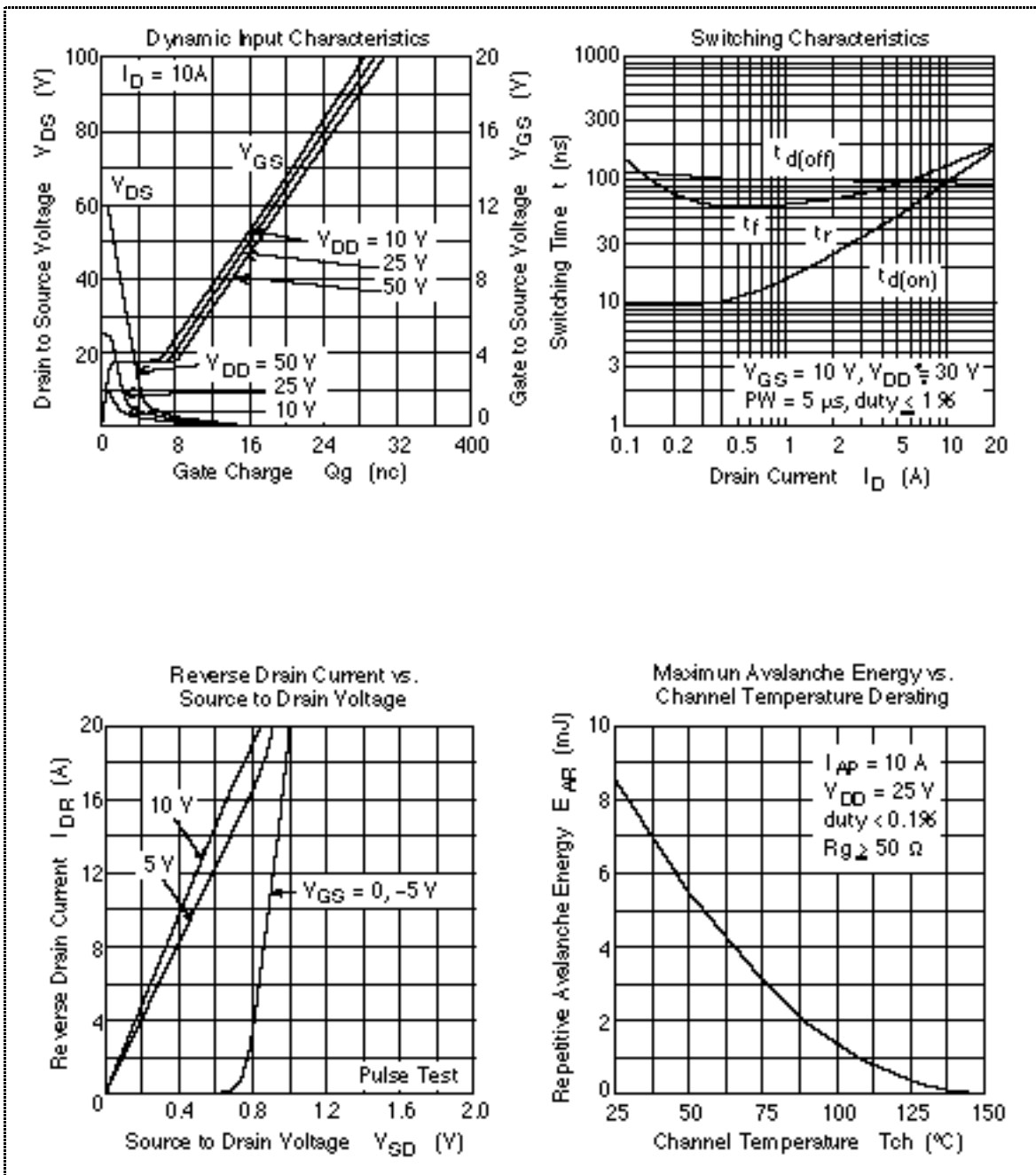
Main Characteristics (N Channel)



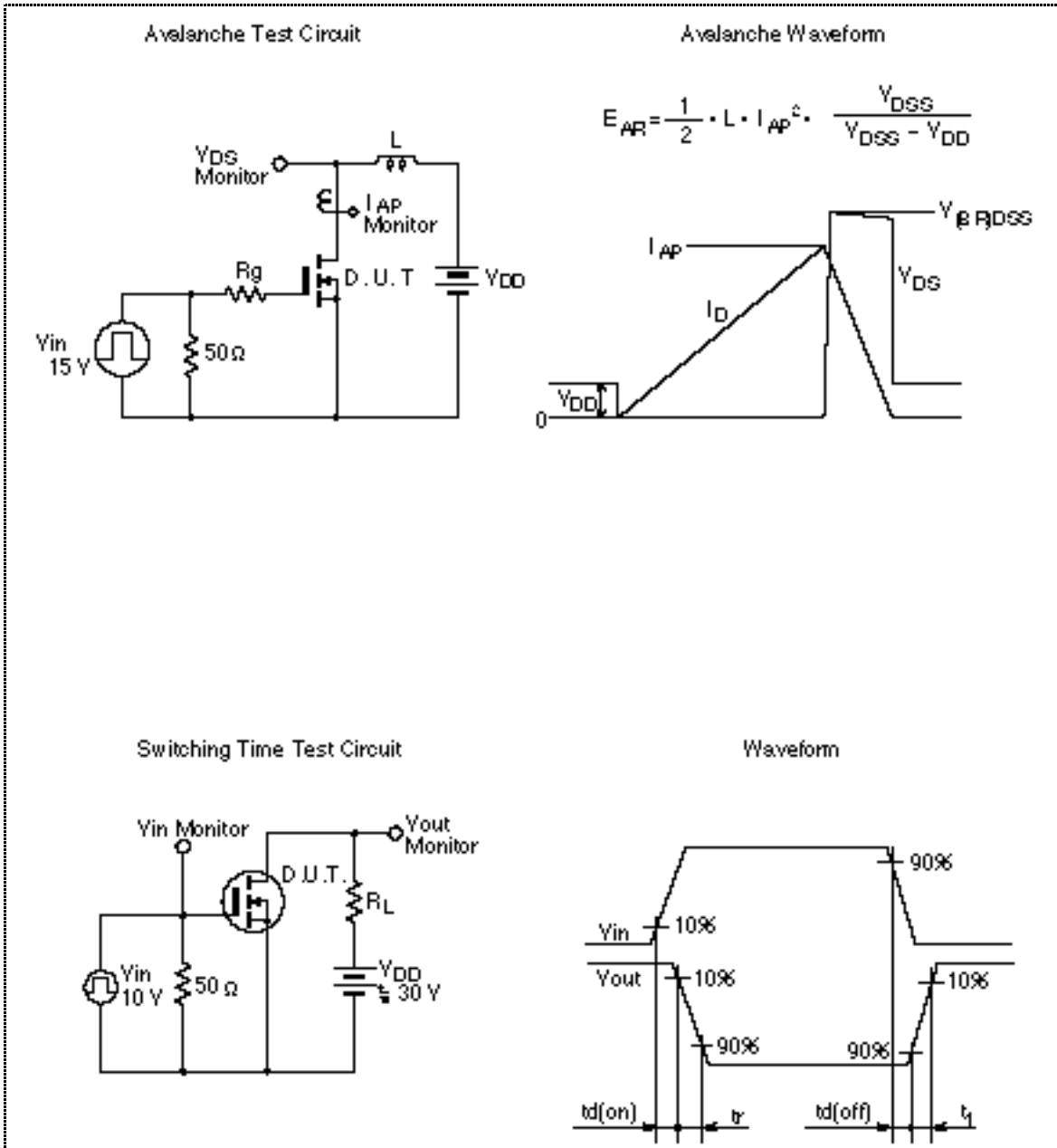
Main Characteristics (N Channel)



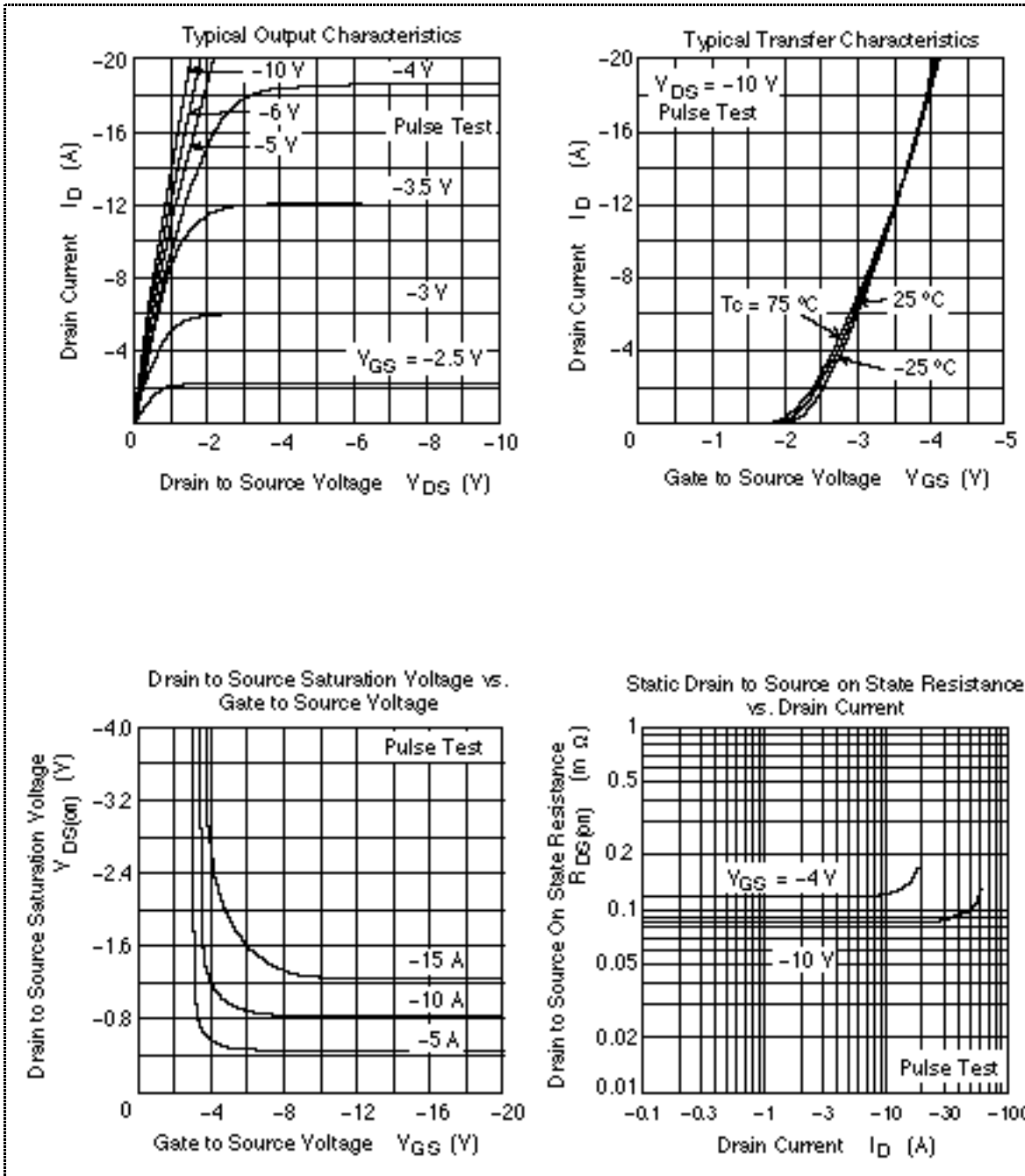
Main Characteristics (N Channel)



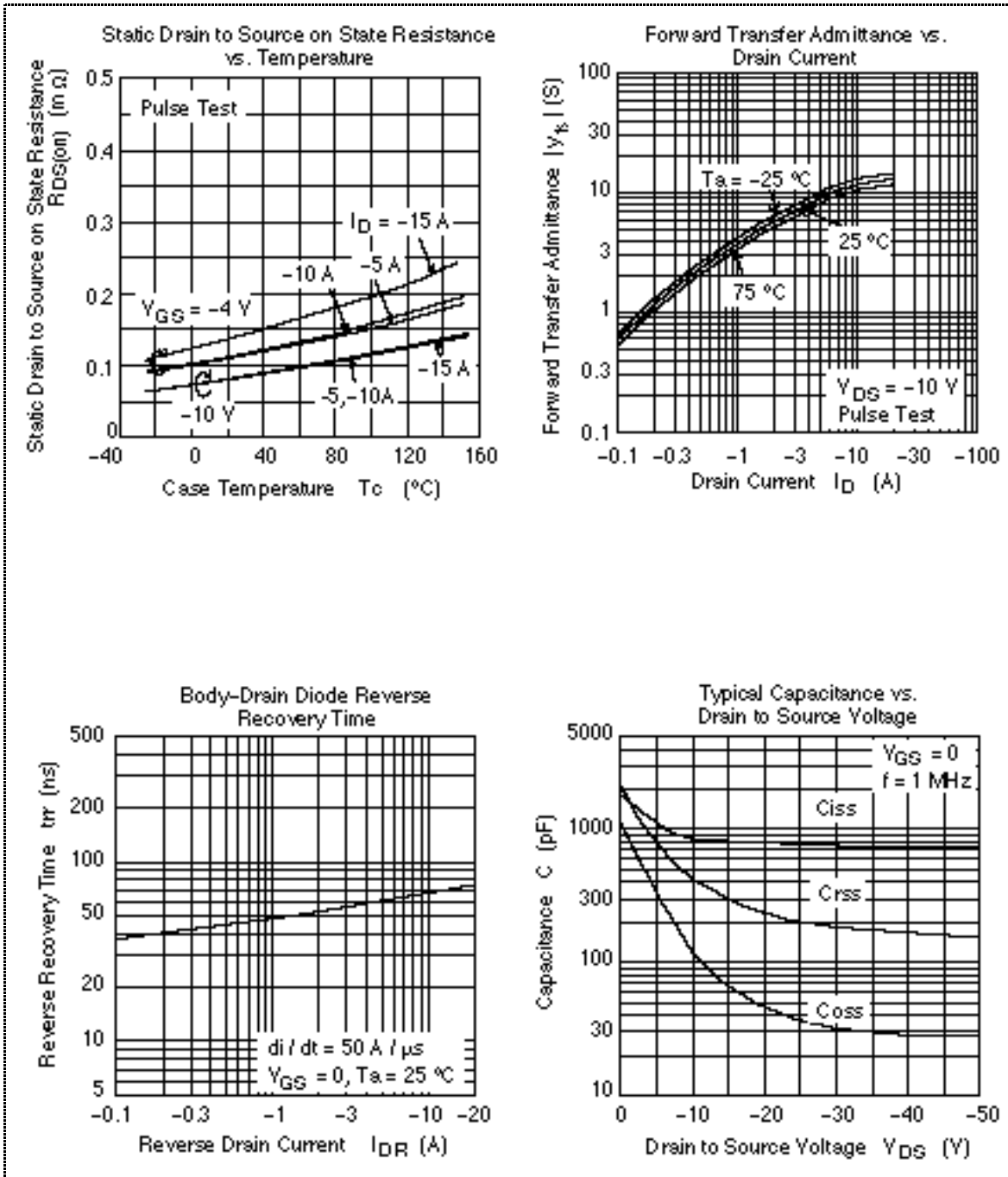
Main Characteristics (N Channel)



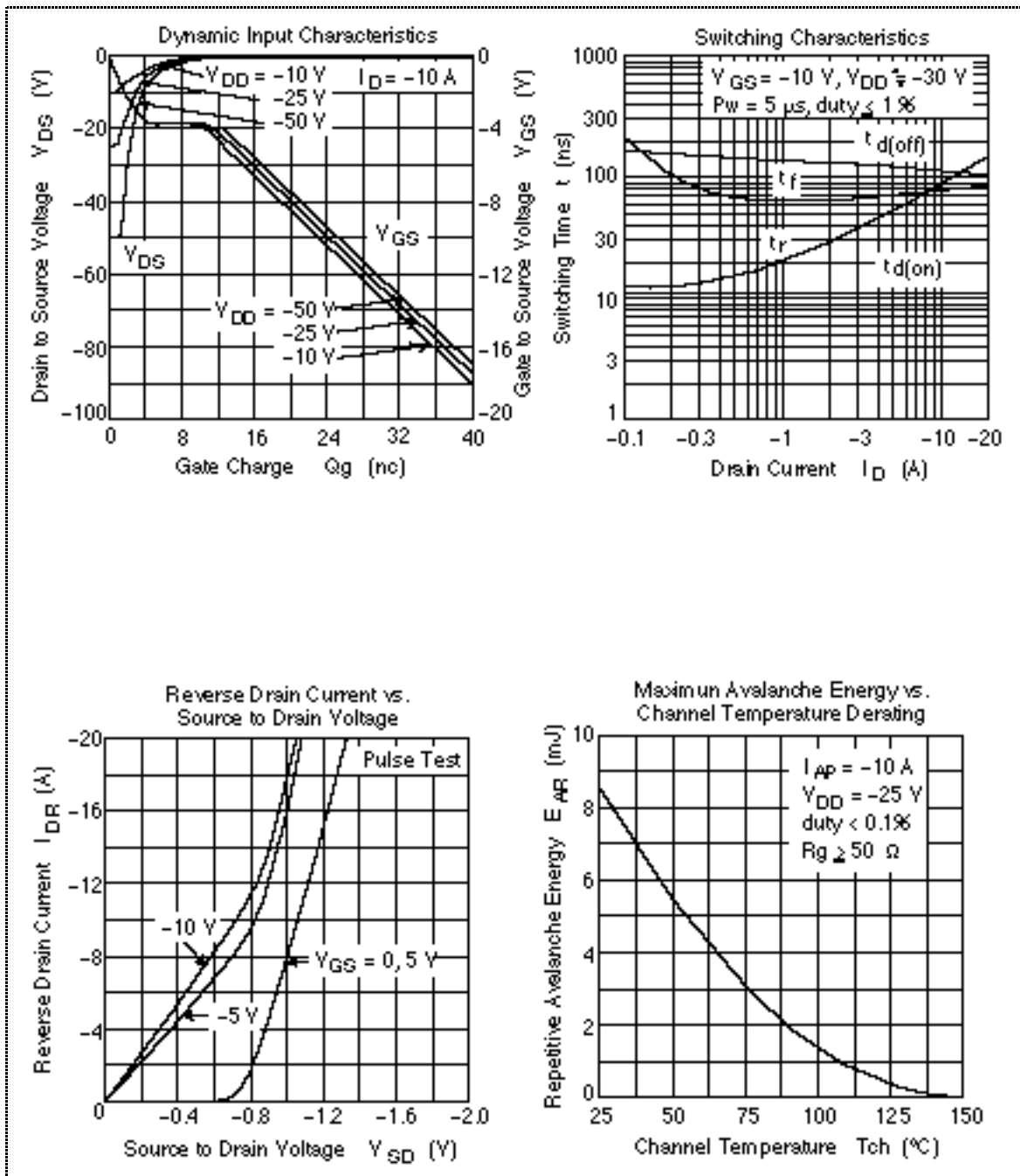
Main Characteristics (P Channel)



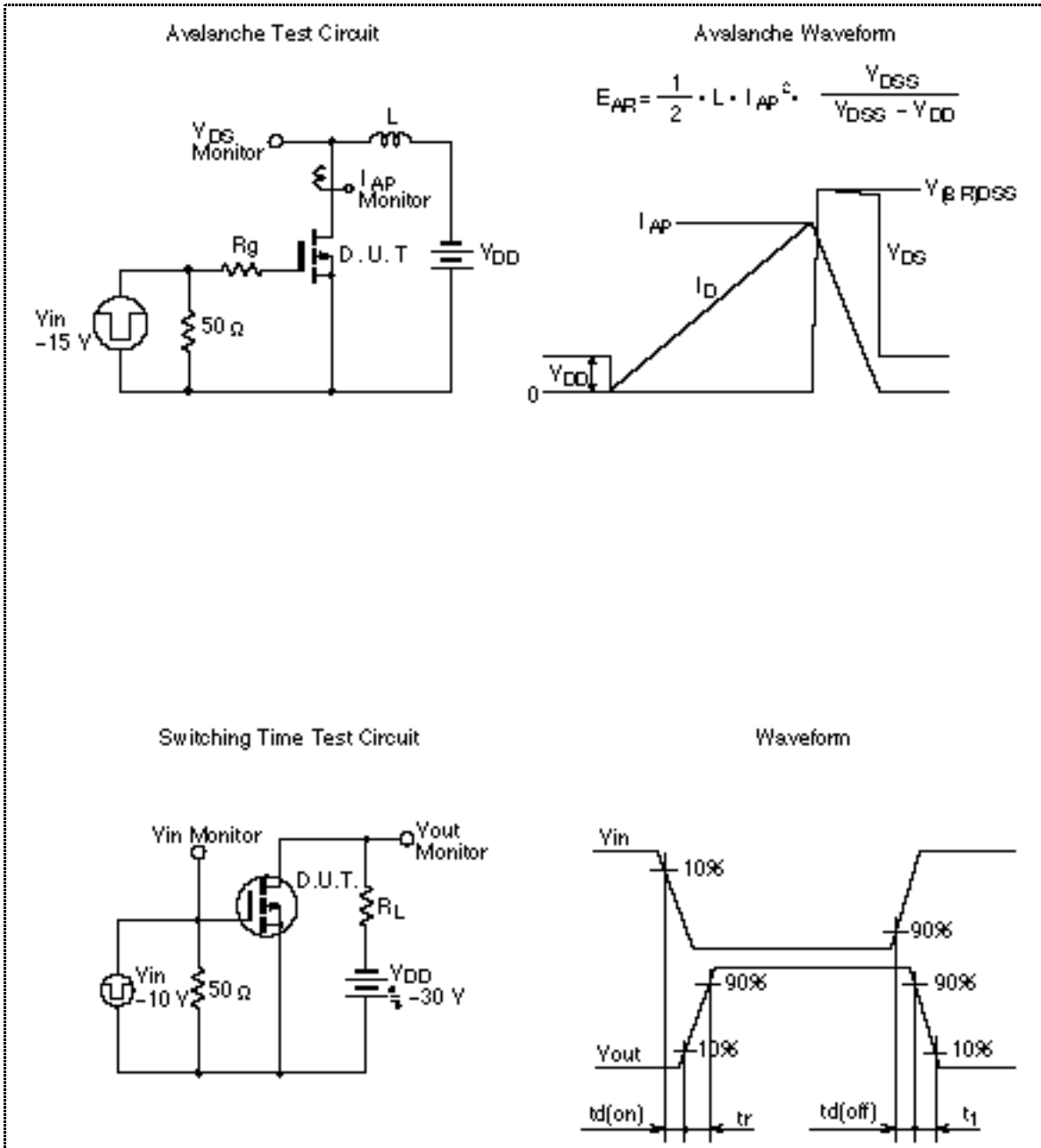
Main Characteristics (P Channel)



Main Characteristics (P Channel)

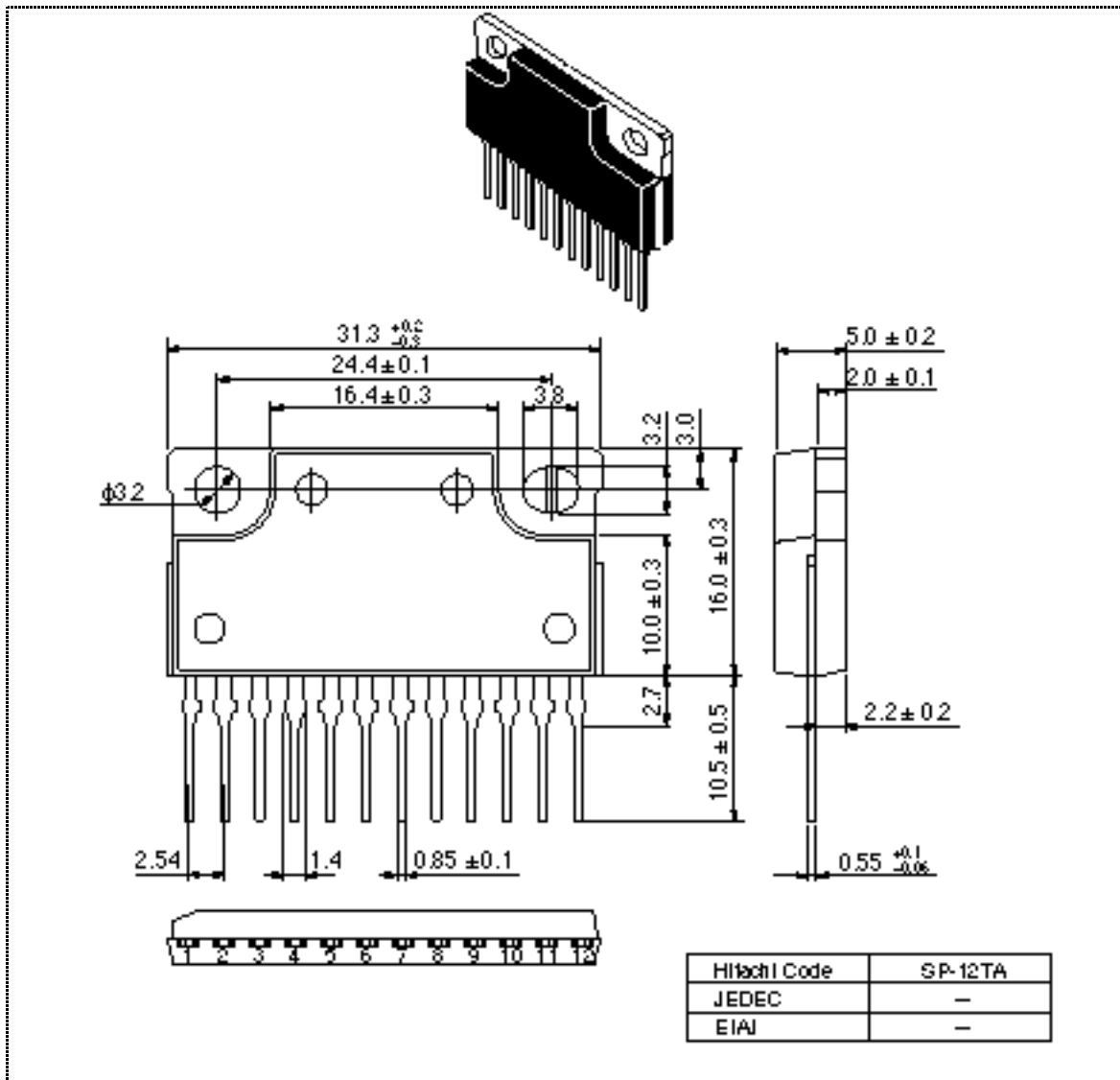


Main Characteristics (P Channel)



Package Dimensions

Unit: mm



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