H5N3003P

Silicon N Channel MOS FET
High Speed Power Switching

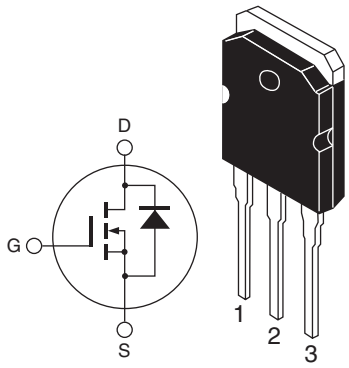
REJ03G0007-0200Z
(Previous ADE-208-1547A(Z))
Rev.2.00
Aug.01.2003

Features

- Low on-resistance
- Low leakage current
- High Speed Switching

Outline

TO-3P



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

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	300	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	40	A
Drain peak current	I_D (pulse) Note1	160	A
Body-drain diode reverse drain current	I_{DR}	40	A
Body-drain diode reverse drain peak current	I_{DR} (pulse) Note1	160	A
Avalanche current	I_{AP} Note3	30	A
Channel dissipation	Pch Note2	150	W
Channel to case Thermal Impedance	θch-c	0.833	°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

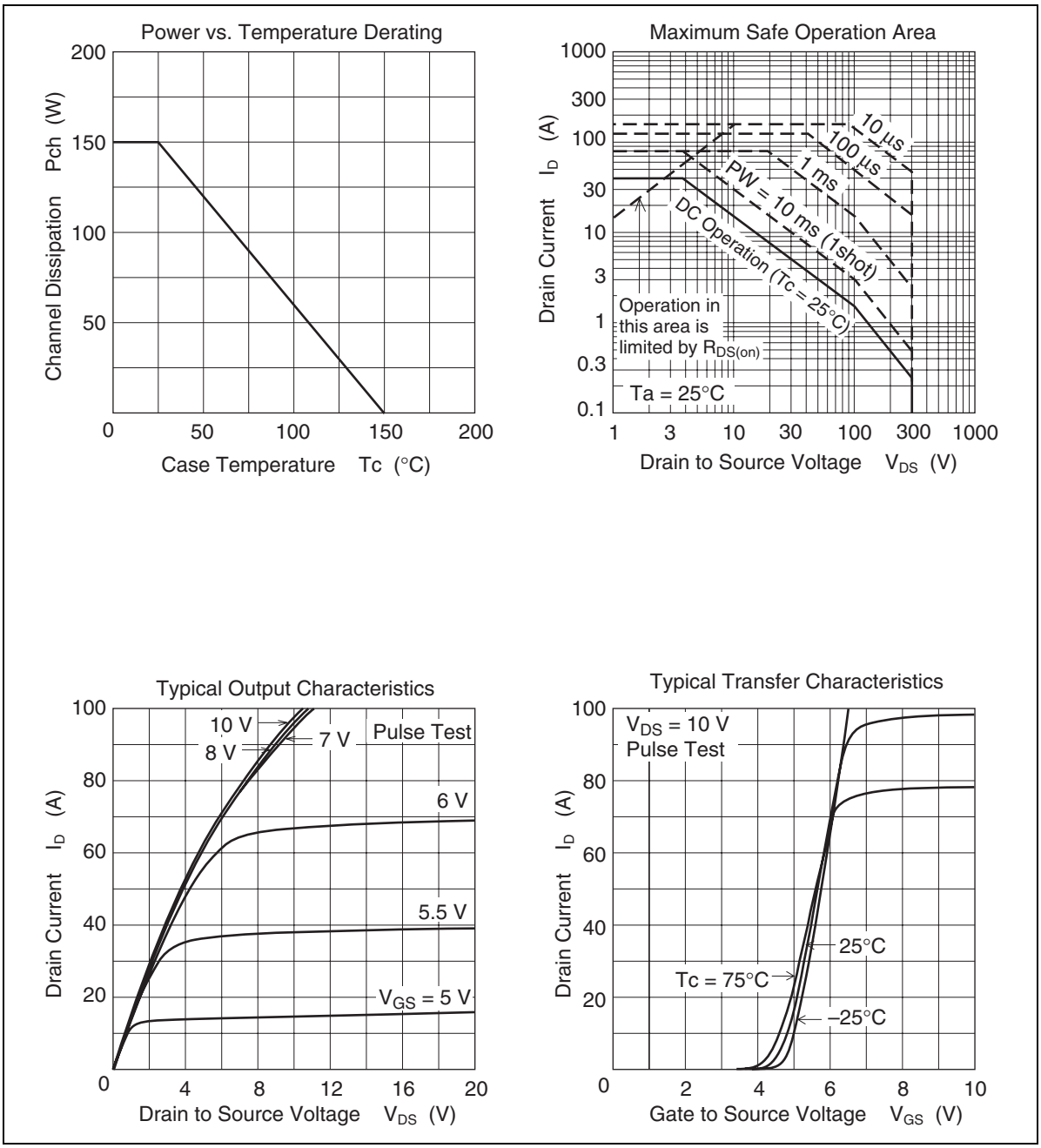
Electrical Characteristics

(Ta = 25°C)

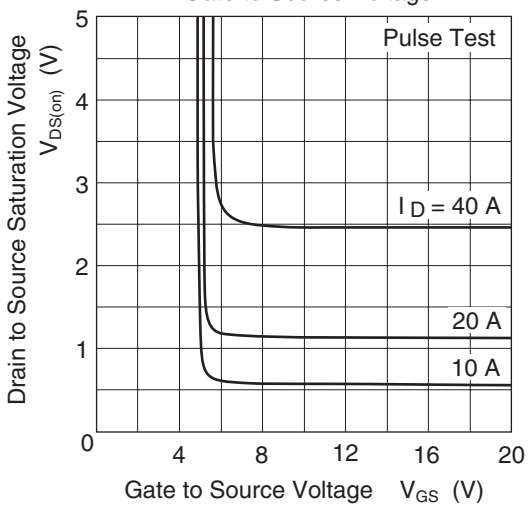
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	300	—	—	V	I_D = 10mA, V_{GS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 300V, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±30V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.0	V	V_{DS} = 10V, I_D = 1mA
Forward transfer admittance	$\|y_{fs}\|$	20	35	—	S	I_D = 20A, V_{DS} = 10V[Note4]
Static drain to source on state resistance	$R_{DS(on)}$	—	0.058	0. 069	Ω	I_D = 20A, V_{GS}= 10V[Note4]
Input capacitance	Ciss	—	5150	—	pF	V_{DS} = 25V
Output capacitance	Coss	—	560	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	90	—	pF	f = 1MHz
Turn-on delay time	td(on)	—	60	—	ns	I_D= 20A
Rise time	tr	—	185	—	ns	R_L = 7.5Ω
Turn-off delay time	td(off)	—	220	—	ns	V_{GS} = 10V
Fall time	tf	—	150	—	ns	Rg=10 Ω
Total gate charge	Qg	—	130	—	nC	V_{DD} = 240V
Gate to source charge	Qgs	—	25	—	nC	V_{GS} = 10V
Gate to drain charge	Qgd	—	60	—	nC	I_D = 40A
Body–drain diode forward voltage	V_{DF}	—	1.0	1.5	V	I_F = 40A, V_{GS} = 0
Body–drain diode reverse recovery time	trr	—	280	—	ns	I_F = 40A, V_{GS} = 0 diF/dt=100A/µs
Body–drain diode reverse recovery charge	Qrr	—	2.5	—	µC	

Notes: 4. Pulse test

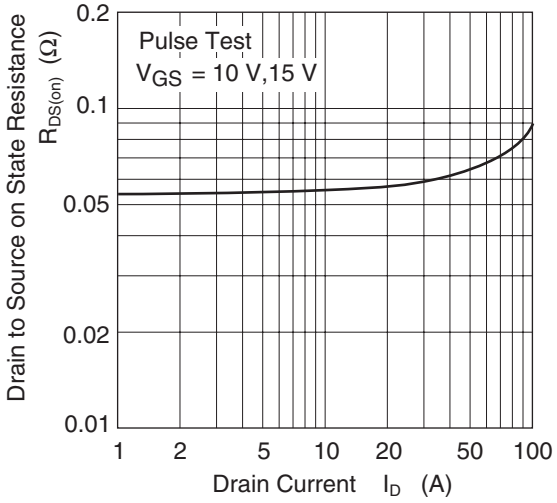
Main Characteristics



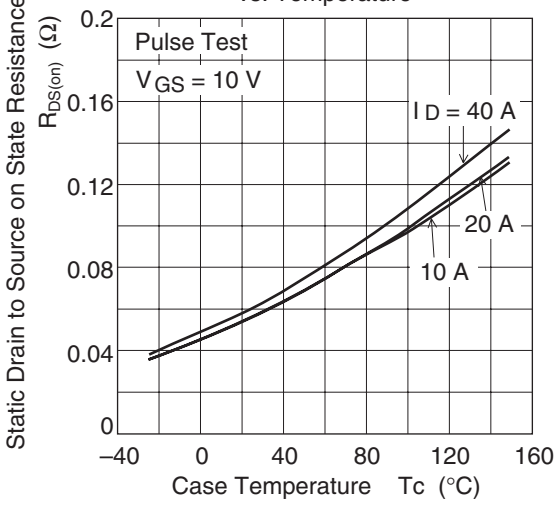
Drain to Source Saturation Voltage vs. Gate to Source Voltage



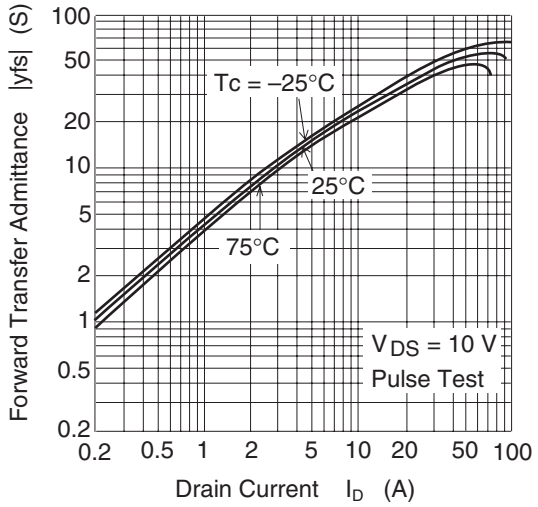
Static Drain to Source on State Resistance vs. Drain Current



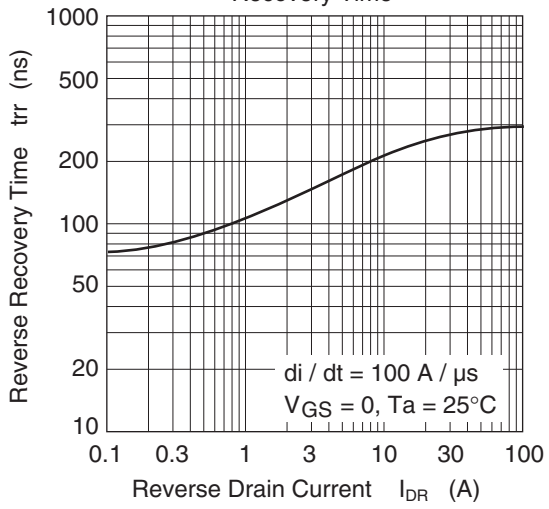
Static Drain to Source on State Resistance vs. Temperature



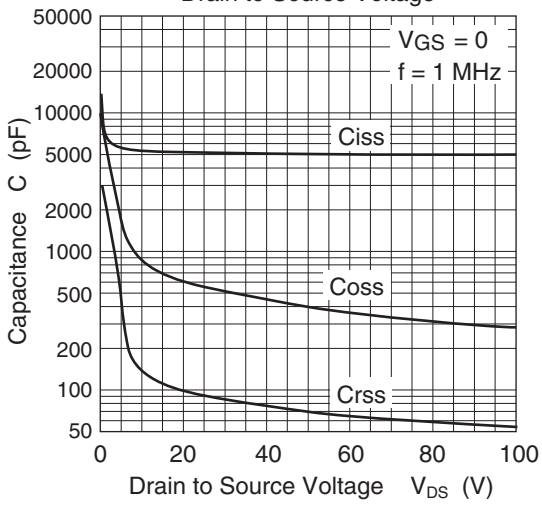
Forward Transfer Admittance vs. Drain Current



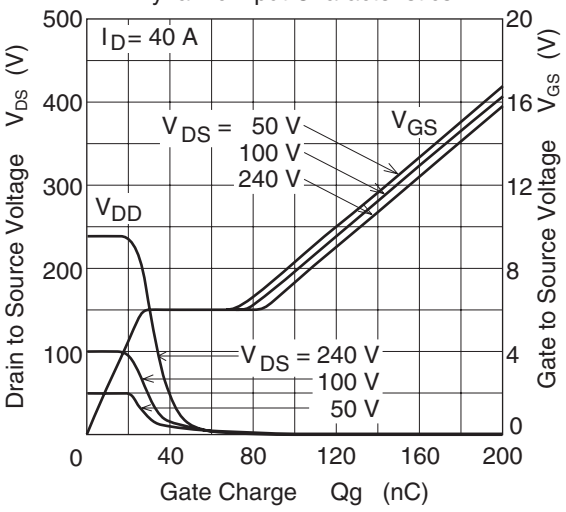
Body-Drain Diode Reverse Recovery Time



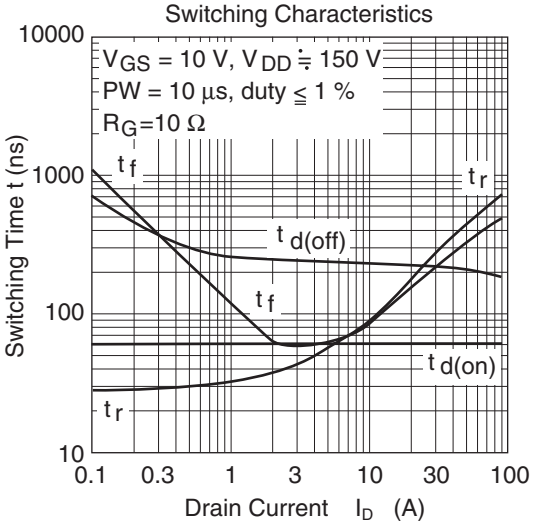
Typical Capacitance vs. Drain to Source Voltage



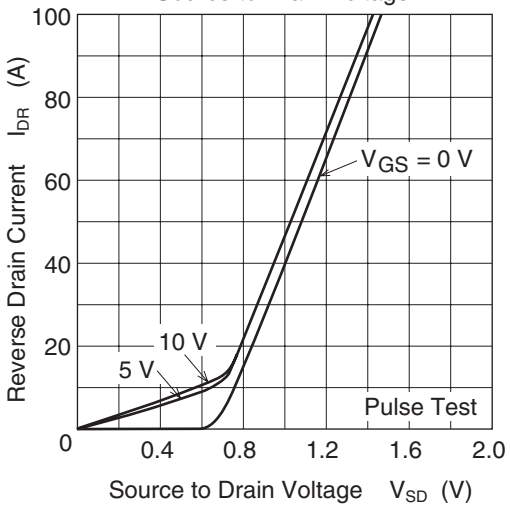
Dynamic Input Characteristics



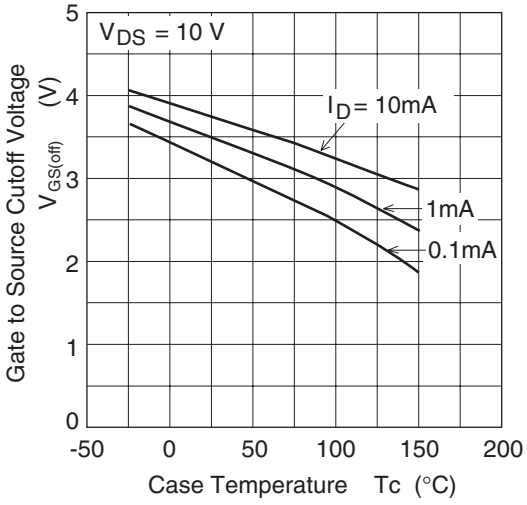
Switching Characteristics



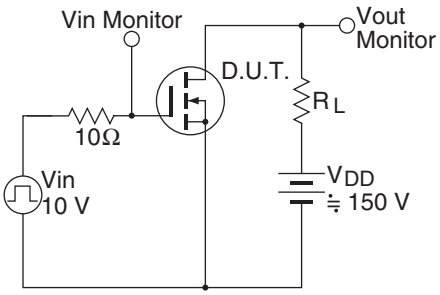
Reverse Drain Current vs. Source to Drain Voltage



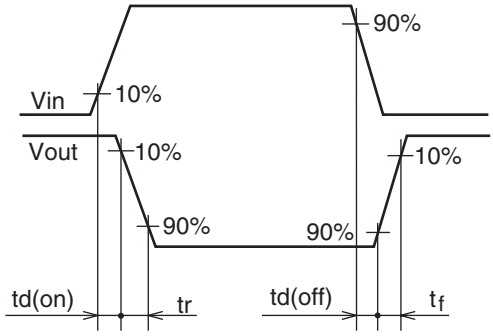
Gate to Source Cutoff Voltage vs. Case Temperature

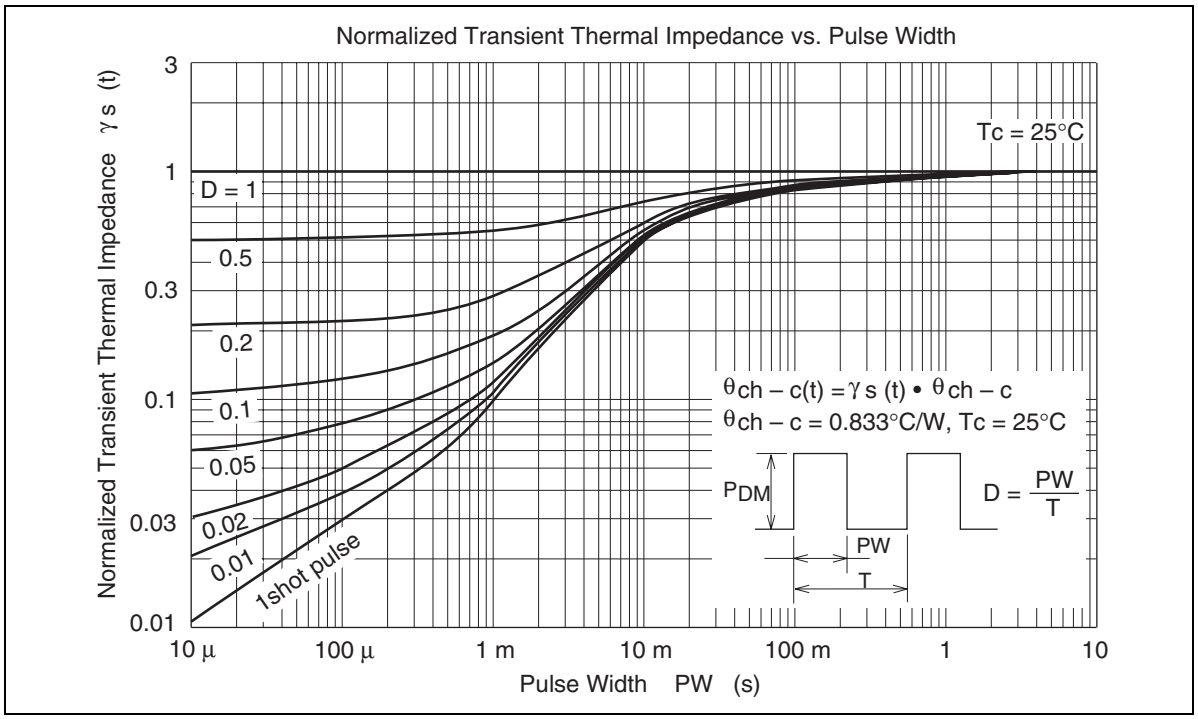


Switching Time Test Circuit



Waveform

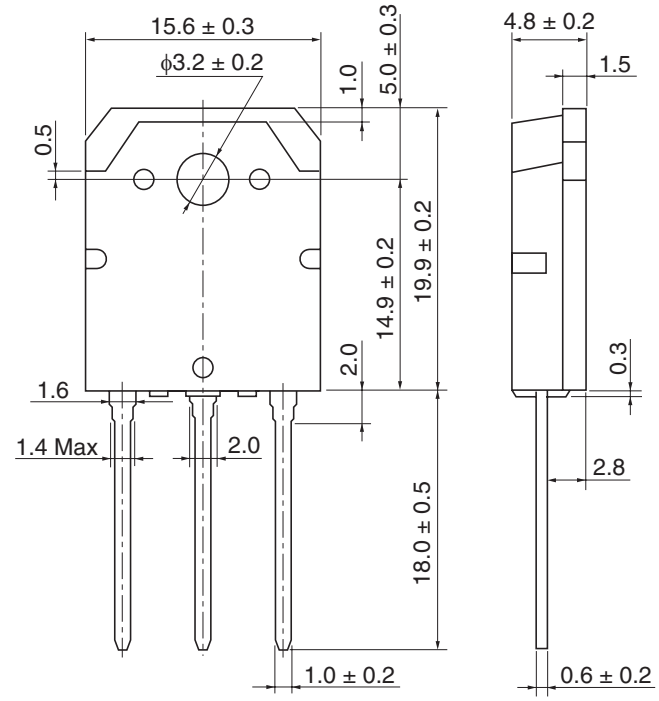


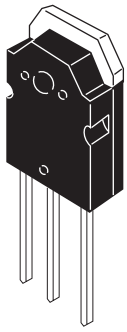

Normalized Transient Thermal Impedance vs. Pulse Width
Normalized Transient Thermal Impedance γs (t)
3
1
0.3
0.1
0.03
0.01
Tc = 25°C
D = 1
0.5
0.2
0.1
0.05
0.02
0.01
1shot pulse
θch – c(t) = γs (t) • θch – c
θch – c = 0.833°C/W, Tc = 25°C
PDM
D = PW / T
PW
T
10 µ
100 µ
1 m
10 m
100 m
1
10
Pulse Width PW (s)

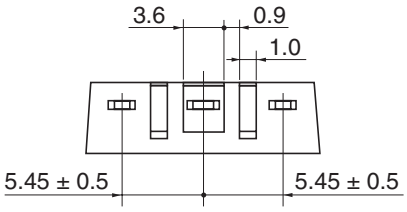
Package Dimensions

As of January, 2003

Unit: mm







Package Code	TO-3P
JEDEC	—
JEITA	Conforms
Mass (reference value)	5.0 g

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