



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

WPB4002 — General-Purpose Switching Device Applications

Features

- Reverse recovery time $t_{rr}=115\text{ns}$ (typ)
- Input capacitance $C_{iss}=2200\text{pF}$ (typ)
- ON-resistance $R_{DS(on)}=0.28\Omega$ (typ)
- 10V drive

Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

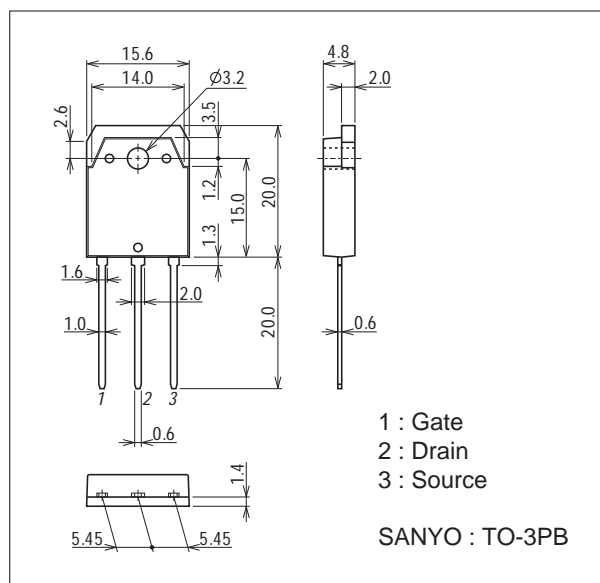
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		600	V
Gate-to-Source Voltage	V_{GSS}		± 30	V
Drain Current (DC)	I_D		23	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	80	A
Source-to-Drain Diode Forward Current (DC)	I_{SD}		23	A
Source-to-Drain Diode Forward Current (Pulse)	I_{SDP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	80	A
Allowable Power Dissipation	PD		2.5	W
		$T_c=25^\circ\text{C}$	220	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *1	EAS		172	mJ
Avalanche Current *2	I_{AV}		17	A

Note : *1 $V_{DD}=99\text{V}$, $L=1\text{mH}$, $I_{AV}=17\text{A}$ (Fig.1)*2 $L \leq 1\text{mH}$, single pulse

Package Dimensions

unit : mm (typ)

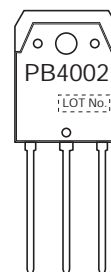
7503-004



Product & Package Information

- Package : TO-3PB
- JEITA, JEDEC : SC-65, TO-247, SOT199
- Minimum Packing Quantity : 100 pcs. / tray

Marking



Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10mA, V_{GS}=0V$	600			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=480V, V_{GS}=0V$			100	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	3		5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=11.5A$	7.5	15		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=11.5A, V_{GS}=10V$		0.28	0.36	Ω
Input Capacitance	C_{iss}	$V_{DS}=30V, f=1MHz$		2200		pF
Output Capacitance	C_{oss}	$V_{DS}=30V, f=1MHz$		400		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=30V, f=1MHz$		83		pF
Turn-ON Delay Time	$t_{d(on)}$	See Fig.2		42		ns
Rise Time	t_r	See Fig.2		130		ns
Turn-OFF Delay Time	$t_{d(off)}$	See Fig.2		234		ns
Fall Time	t_f	See Fig.2		84		ns
Total Gate Charge	Q_g	$V_{DS}=200V, V_{GS}=10V, I_D=23A$		84		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=200V, V_{GS}=10V, I_D=23A$		15.2		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=200V, V_{GS}=10V, I_D=23A$		45.4		nC
Diode Forward Voltage	V_{SD}	$I_S=23A, V_{GS}=0V$		1.1	1.5	V
Reverse Recovery Time	t_{rr}	See Fig.3		115		ns
Reverse Recovery Charge	Q_{rr}	$I_{SD}=23A, V_{GS}=0V, di/dt=100A/\mu s$		340		nC

Fig.1 Avalanche Resistance Test Circuit

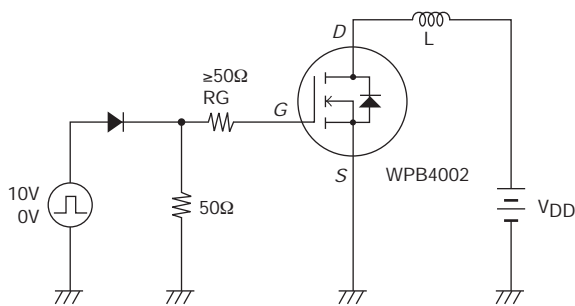


Fig.2 Switching Time Test Circuit

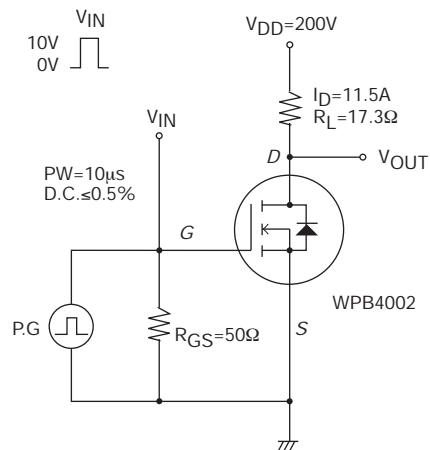
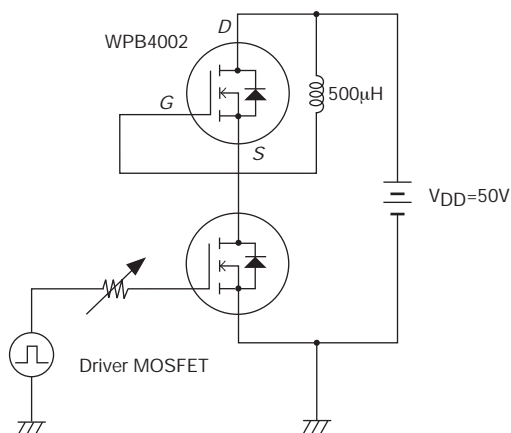
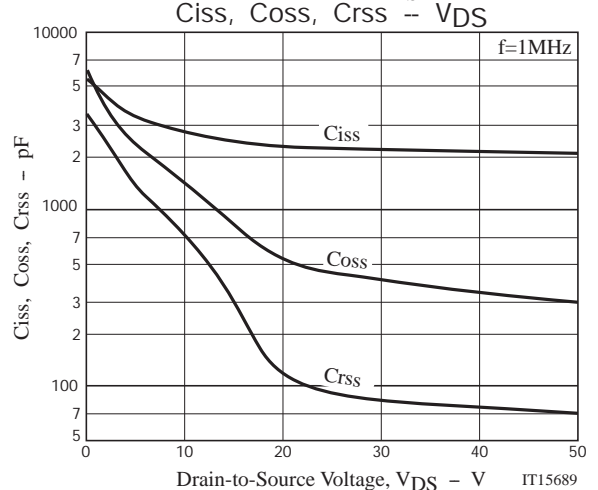
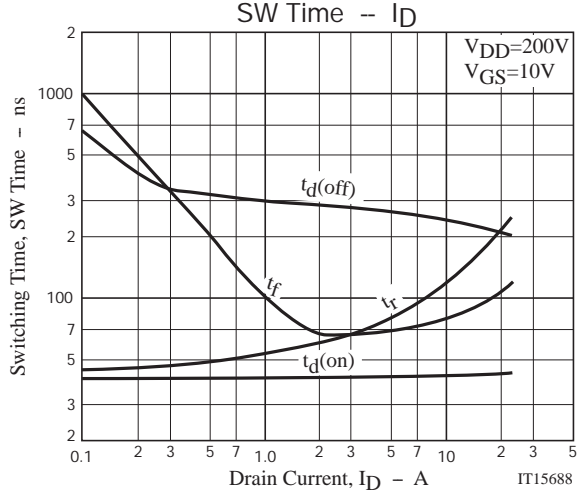
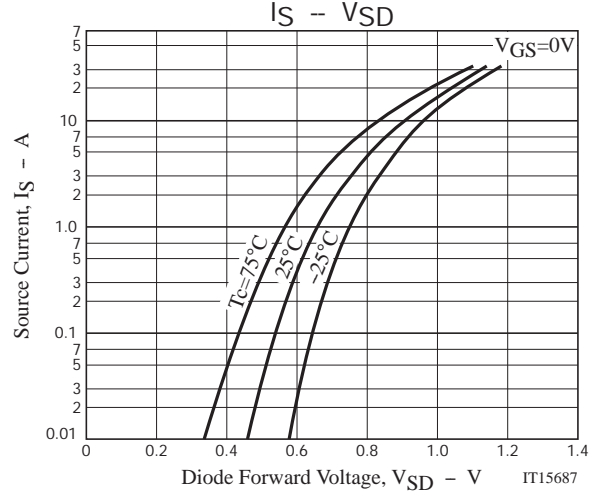
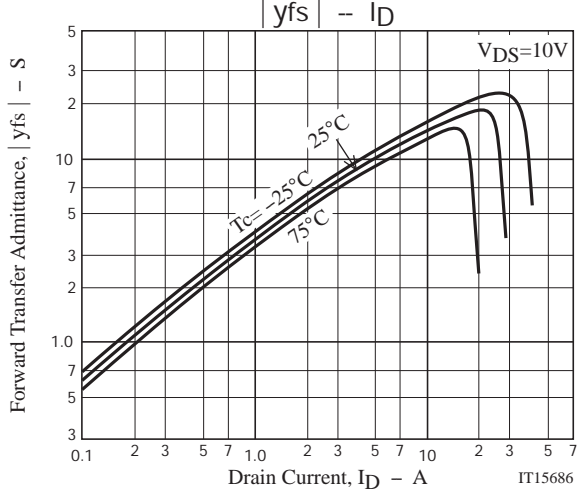
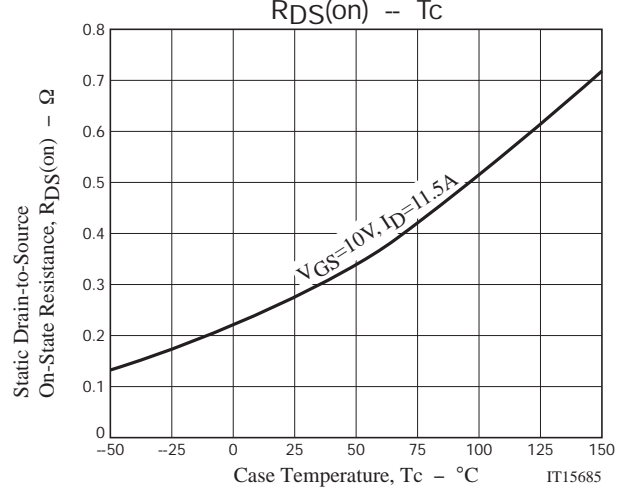
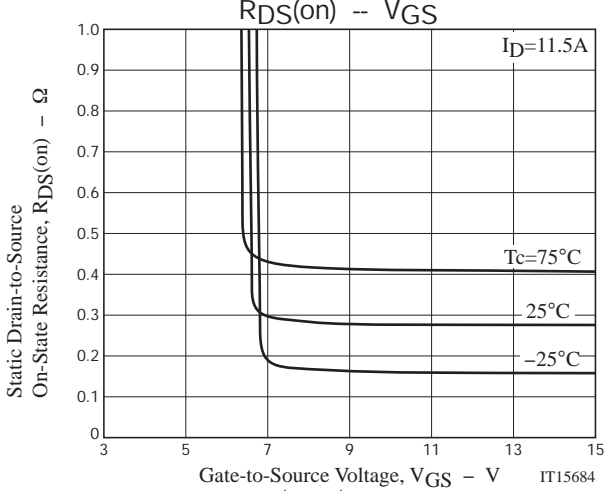
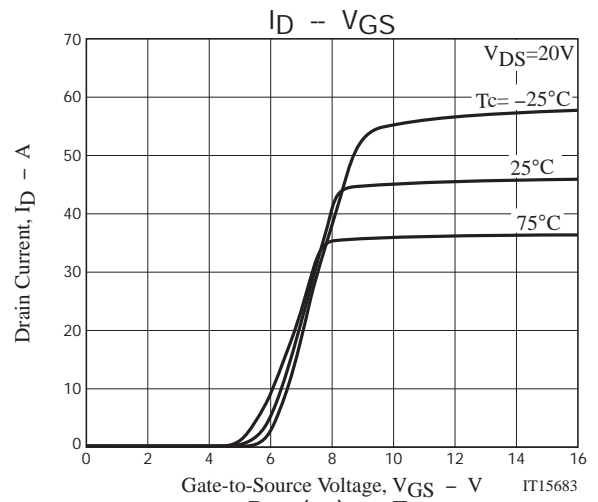
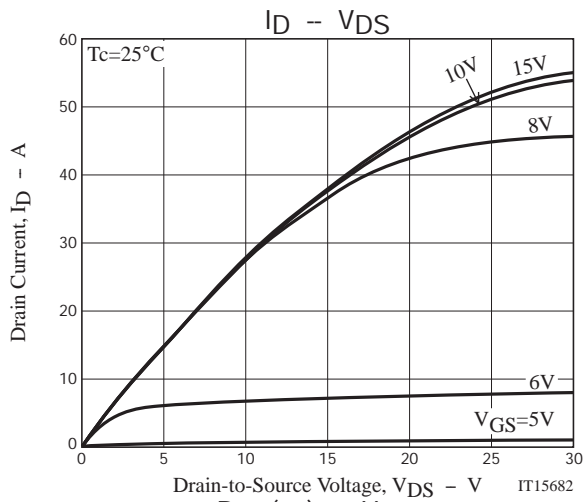
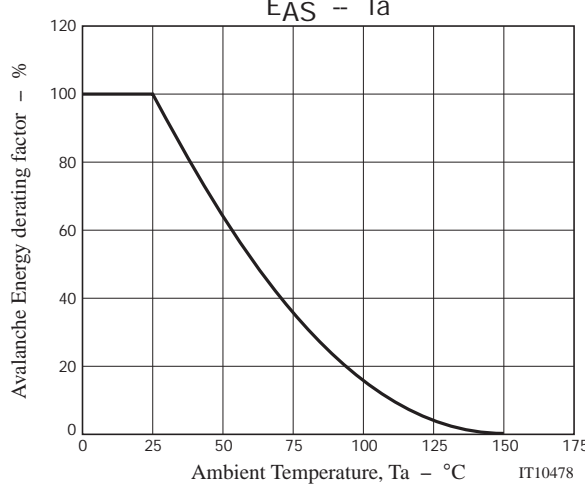
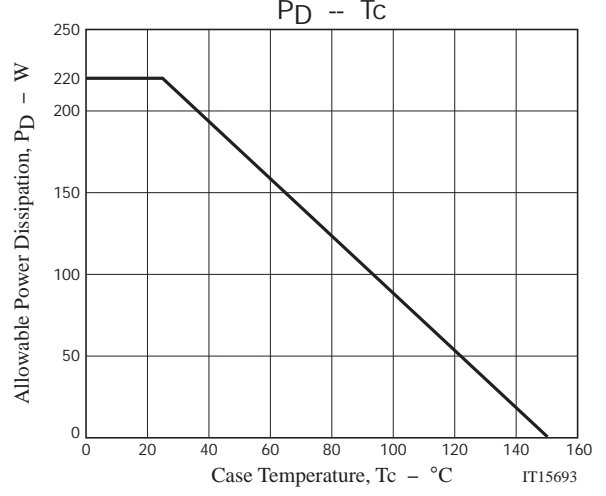
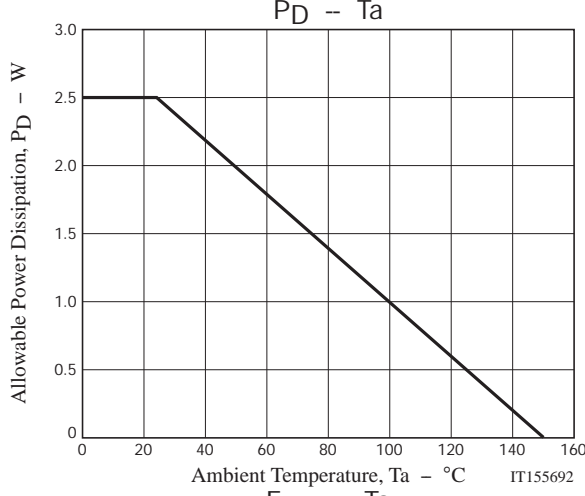
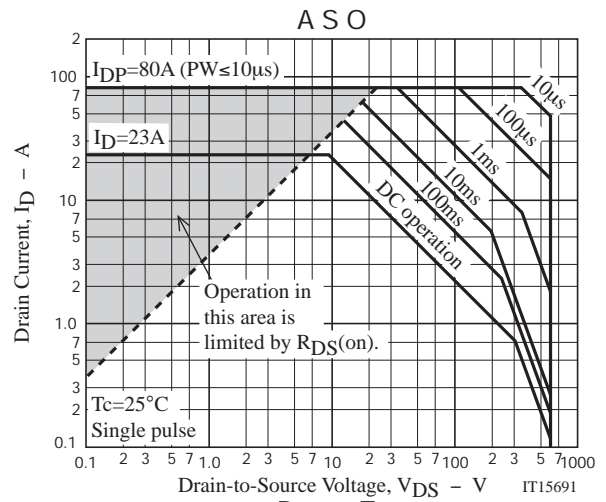
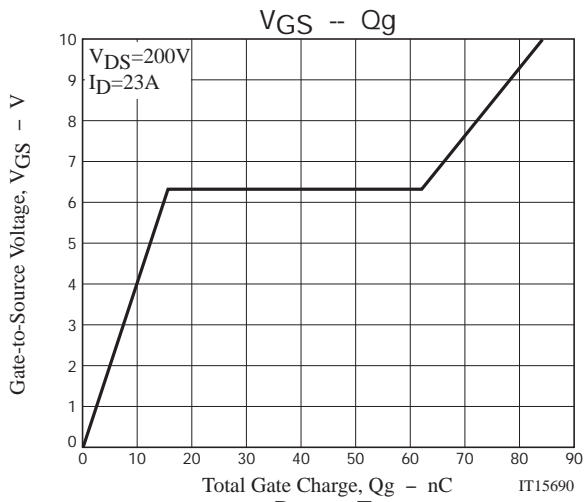


Fig.3 trr Reverse Recovery Resistance Test Circuit







Note on usage : Since the WPB4002 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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