



SANYO Semiconductors

## DATA SHEET

# WPB4002 — N-Channel Silicon MOSFET

## 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	$V_{GSS}$		$\pm 30$	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

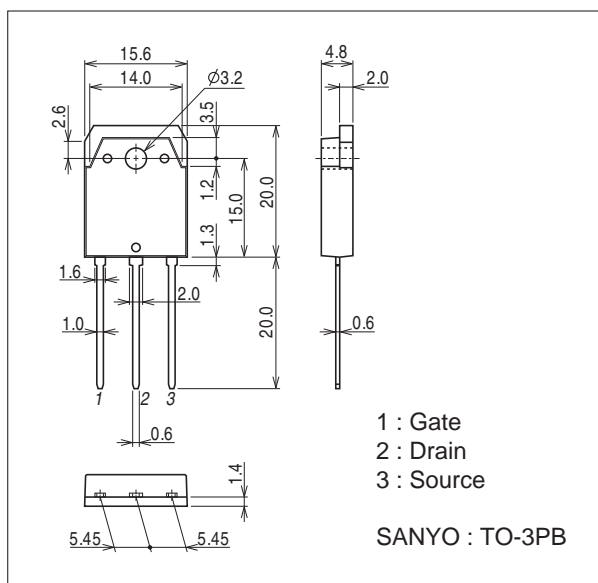
Note : \*1  $V_{DD}=99\text{V}$ ,  $L=1\text{mH}$ ,  $I_{AV}=17\text{A}$  (Fig.1)

\*2  $L \leq 1\text{mH}$ , single pulse

### Package Dimensions

unit : mm (typ)

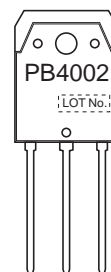
7503-004



### Product & Package Information

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

### Marking



# WPB4002

## 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	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$			$\pm 100$	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	$\Omega$
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

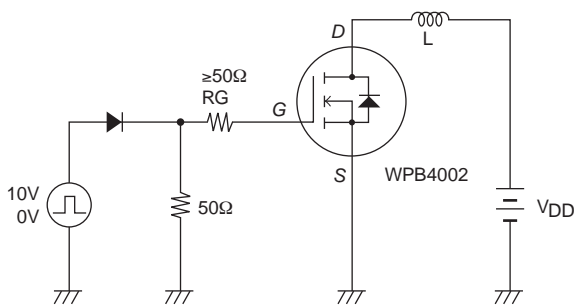


Fig.2 Switching Time Test Circuit

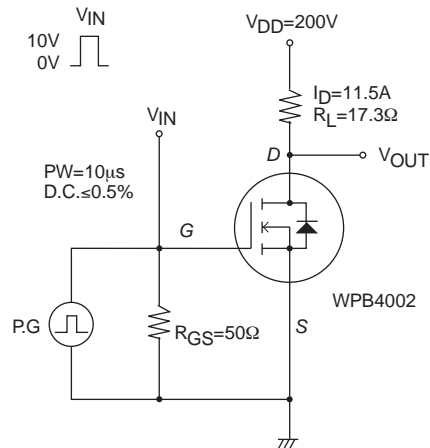
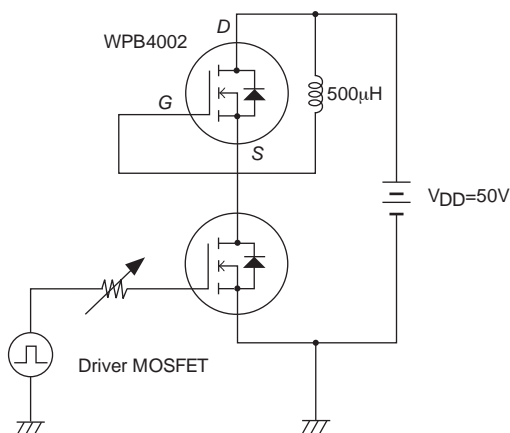
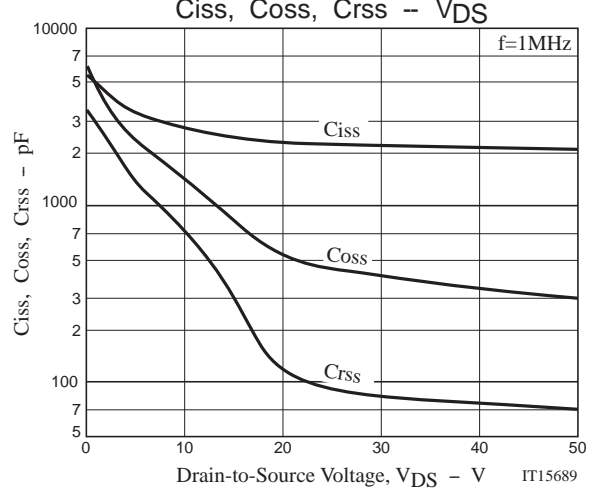
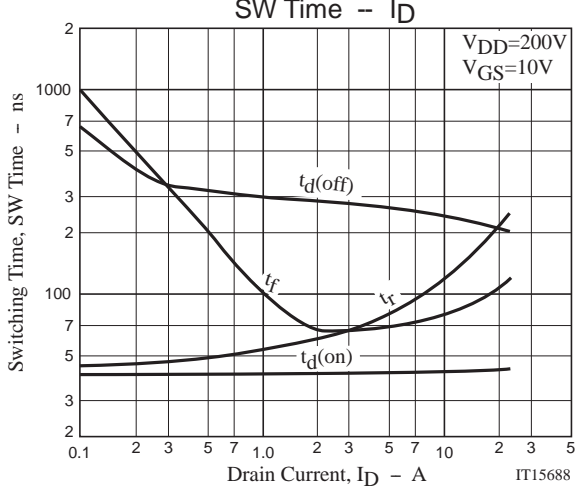
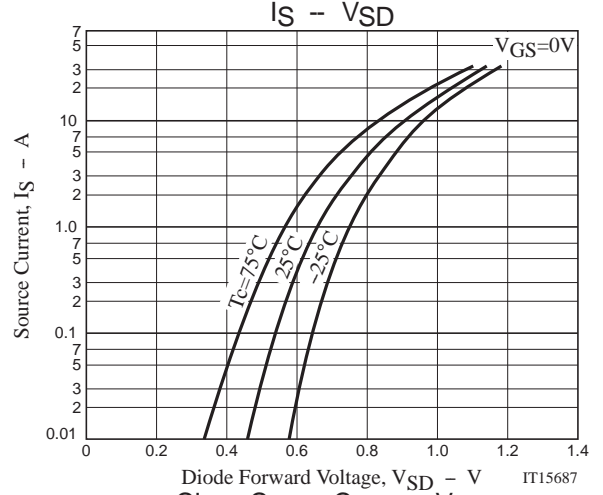
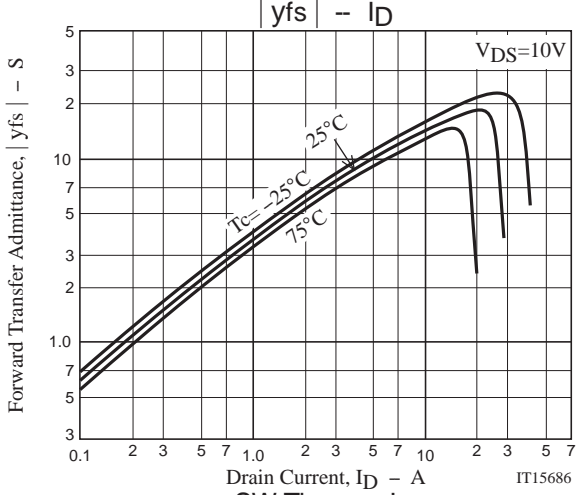
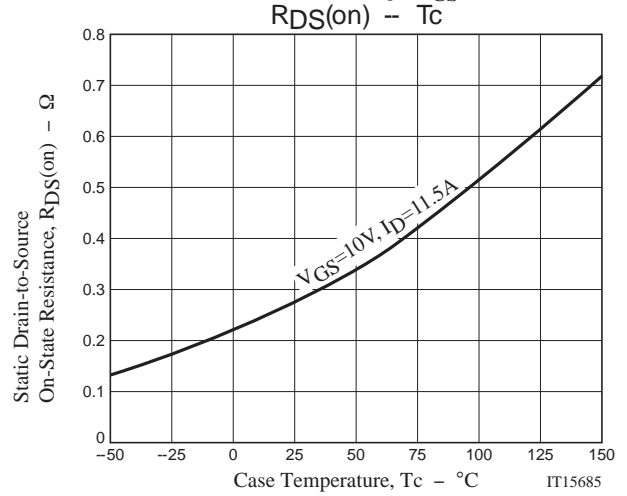
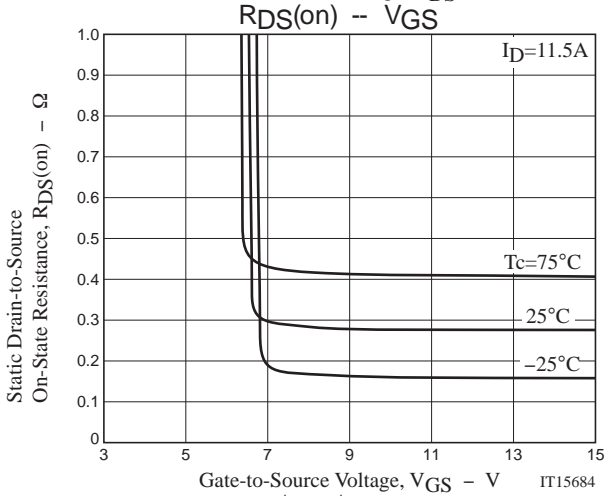
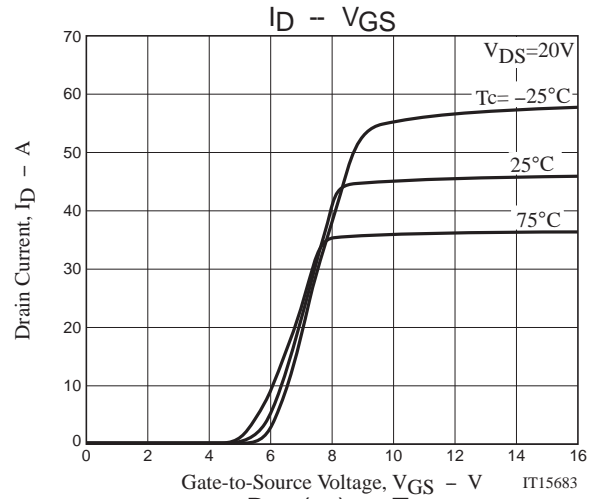
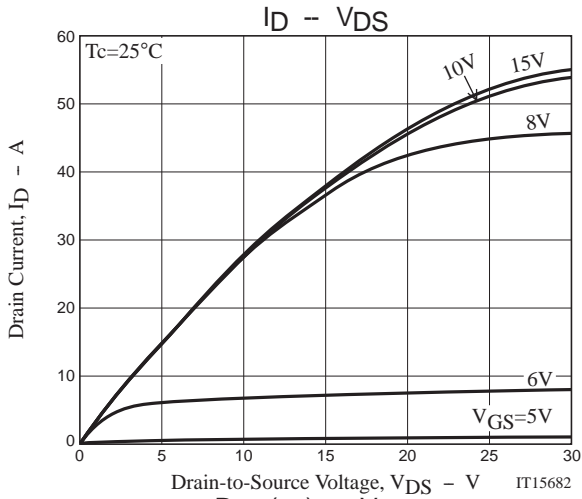
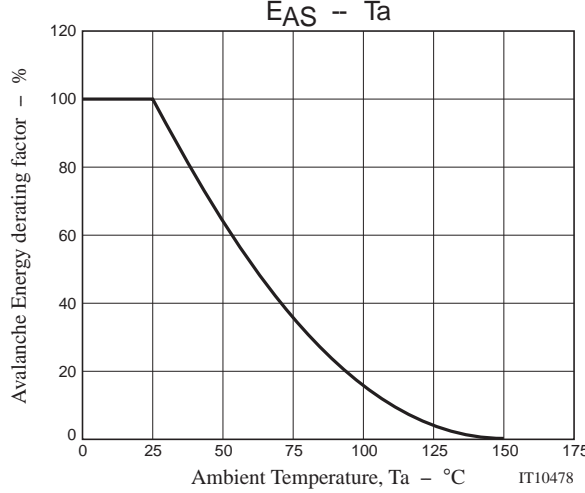
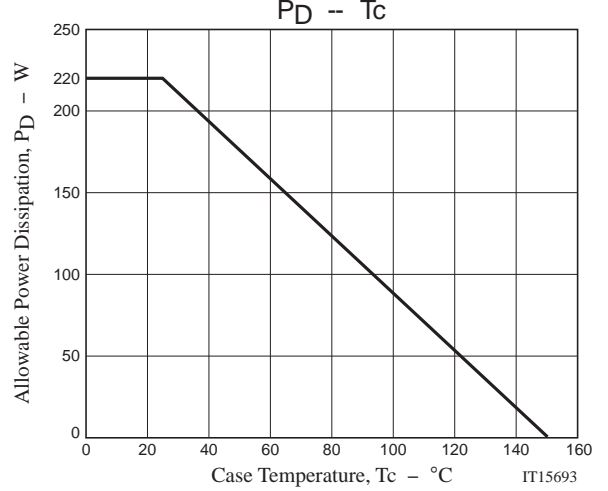
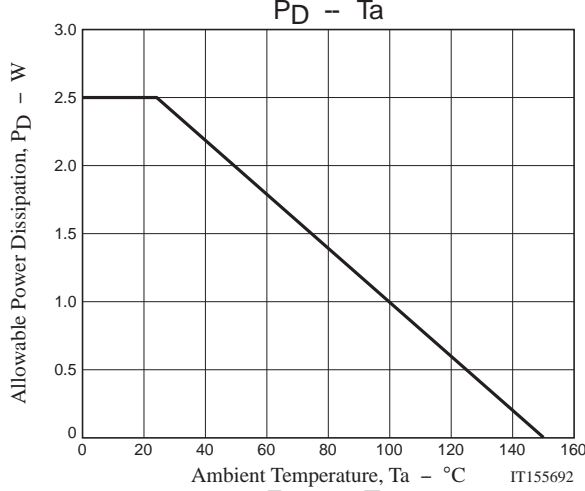
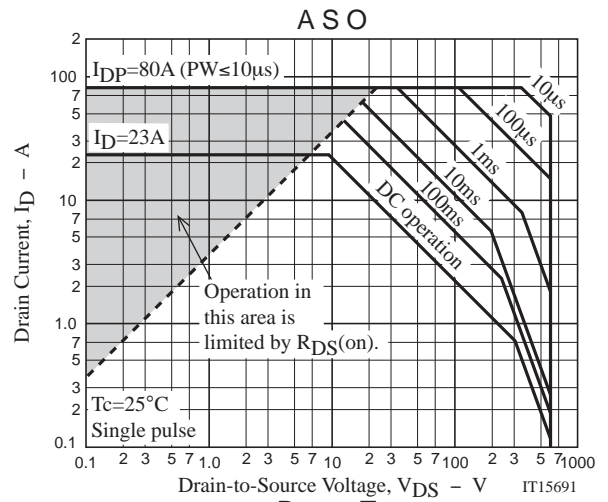
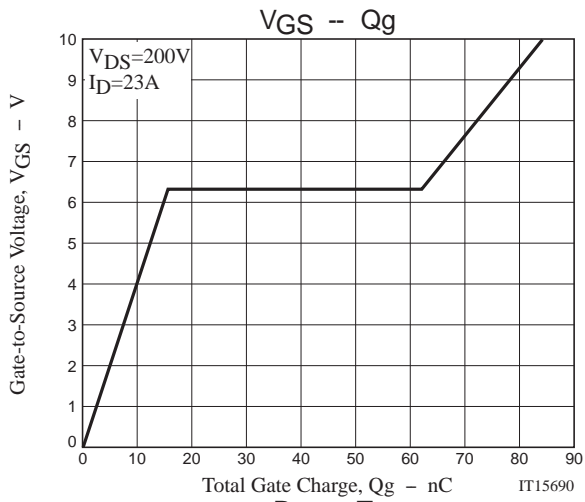


Fig.3 trr Reverse Recovery Resistance Test Circuit







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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