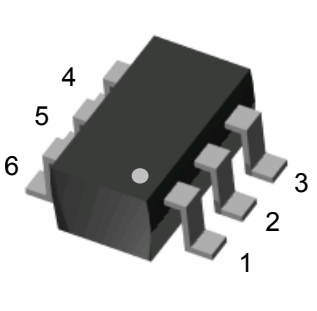
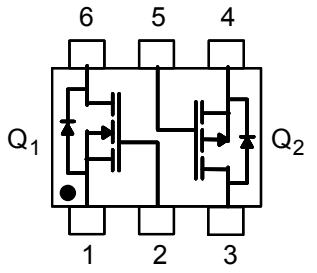
BSS8402DW

COMPLIMENTARY PAIR ENHANCEMENT MODE MOSFETS

This space-efficient device contains an electrically-isolated complimentary pair of enhancement-mode MOSFETs (one N-channel and one P-channel). It comes in a very small SOT-363 package. This device is ideal for portable applications where board space is at a premium.

SOT- 363





FEATURES

- **Complimentary Pairs**
- **Low On-Resistance**
- **Low Gate Threshold Voltage**
- **Fast Switching**
- **Lead free in compliance with EU RoHS 2011/65/EU directive**
- **Green molding compound as per IEC61249 Std. . (Halogen Free)**

APPLICATIONS

- **Switching Power Supplies**
- **Hand-Held Computers, PDAs**

MARKING CODE: S82

MAXIMUM RATINGS - TOTAL DEVICE T_J = 25°C Unless otherwise noted

Rating	Symbol	Value	Units
Total Power Dissipation (Note 1)	P_D	200	mW
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	°C

MAXIMUM RATINGS N - CHANNEL - Q_1 , 2N7002 T_J = 25°C Unless otherwise noted

Rating	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage R_{GS} < 1.0Mohm	V_{DGR}	60	V
Gate-Source Voltage - Continuous	V_{GSS}	±20	V
Drain Current - Continuous (Note 1)	I_D	115	mA

MAXIMUM RATINGS P - CHANNEL - Q_2 , BSS84 T_J = 25°C Unless otherwise noted

Rating	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	-50	V
Drain-Gate Voltage R_{GS} < 20Kohm	V_{DGR}	-50	V
Gate-Source Voltage - Continuous	V_{GSS}	±20	V
Drain Current - Continuous (Note 1)	I_D	130	mA

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Units
Thermal Resistance, Junction to Ambient (Note 1)	R_{thja}	625	°C/W

Note 1. FR-5 board 1.0 x 0.75 x 0.062 inch with minimum recommended pad layout

Electrical Characteristics - N-CHANNEL - Q_1 , 2N7002 T_J = 25°C Unless otherwise noted

OFF CHARACTERISTICS (Note 2)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	I_D= 10μA, V_{GS}= 0V	60	80	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 60V, V_{GS}= 0 T_J=25°C	-	-	1.0	μA
		T_J=125°C	-	-	500	
Gate-Body Leakage	I_{GSS}	V_{GS}= ±20V, V_{DS}= 0V	-	-	±10	nA

ON CHARACTERISTICS (Note 2)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS} I_D= 250μA	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 5V, I_D= 0.05A	-	1.8	4.5	Ohms
		V_{GS}= 10V, I_D= 0.5A	-	2.0	7.0	
On-State Drain Current	$I_{D(ON)}$	V_{GS}= 10V, V_{DS}= 7.5V	0.5	1.65	-	A
Forward Transconductance	g_{FS}	V_{DS}= 10V, I_D= 0.2A	0.08	-	-	S

DYNAMIC CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input Capacitance	C_{iss}	V_{DS}= 25V, V_{GS}= 0V, f = 1.0MHz	-	-	50	pF
Output Capacitance	C_{oss}		-	-	25	pF
Reverse Transfer Capacitance	C_{rss}		-	-	5.0	pF

SWITCHING CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=30V, I_D=0.2A, R_L=150ohm R_{GEN}= 25ohm, V_{GEN}= 10V	-	-	20	ns
Turn-Off Delay Time	$t_{D(OFF)}$		-	-	20	ns

Note 2. Short duration test pulse used to minimize self-heating

Electrical Characteristics - P-CHANNEL - Q_2 , BSS84 T_J = 25°C Unless otherwise noted

OFF CHARACTERISTICS (Note 3)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	I_D= -250µA, V_{GS}= 0V	-50	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -50V, V_{GS}= 0V, T_J=25°C	-	-	-15	µA
		V_{DS}= -50V, V_{GS}= 0V, T_J=125°C	-	-	-60	
		V_{DS}= -25V, V_{GS}= 0V, T_J=25°C	-	-	-0.1	
Gate-Body Leakage	I_{GSS}	V_{GS}= ±20V, V_{DS}= 0V	-	-	±10	nA

ON CHARACTERISTICS (Note 3)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= -1mA	-0.8	1.44	-2.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= -5V, I_D= -0.1A	-	3.8	10	Ohms
Forward Transconductance	g_{FS}	V_{DS}= -25V, I_D= -0.1A	0.05	-	-	S

DYNAMIC CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input Capacitance	C_{iss}	V_{DS}= -25V, V_{GS}= 0V, f = 1.0MHz	-	-	45	pF
Output Capacitance	C_{oss}		-	-	25	pF
Reverse Transfer Capacitance	C_{rss}		-	-	12	pF

SWITCHING CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}= -30V, I_D = -0.27A, R_{GEN}= 50ohm, V_{GS}= -10V	-	7.5	-	ns
Turn-Off Delay Time	$t_{D(OFF)}$		-	25	-	ns

Note 3. Short duration test pulse used to minimize self-heating

Typical Characteristics Curves - N-Channel - Q_1, 2N7002 T_J = 25°C Unless otherwise noted

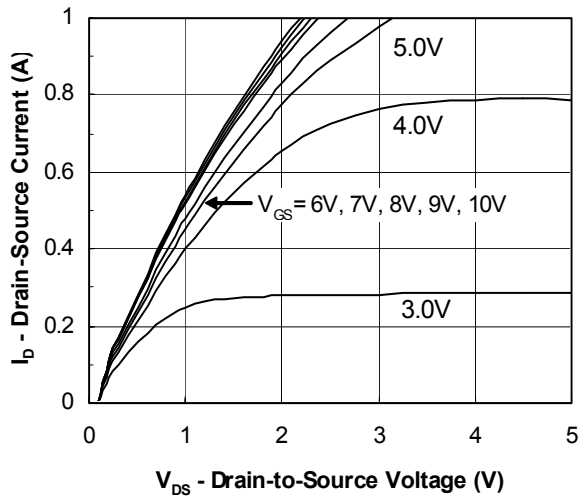


Fig. 1. Output Characteristics

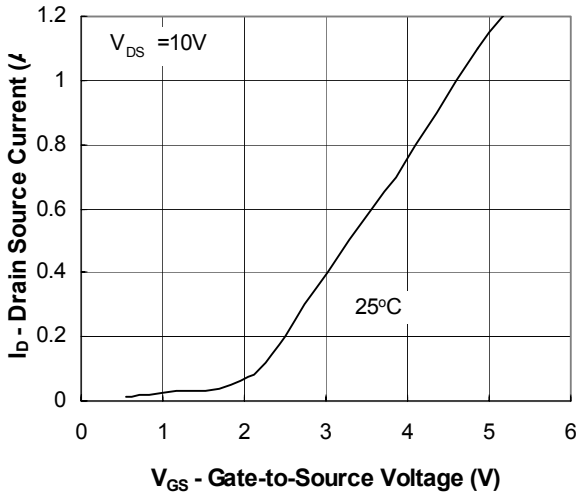


Fig. 2. Transfer Characteristics

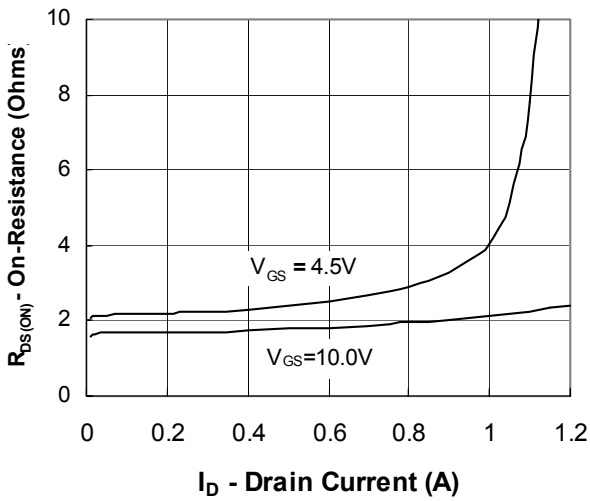


Fig. 3. On-Resistance vs. Drain Current

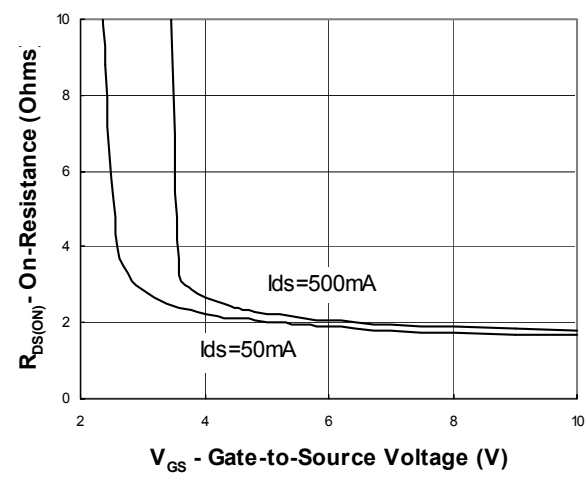


Fig. 4. On-Resistance vs. G-S Voltage

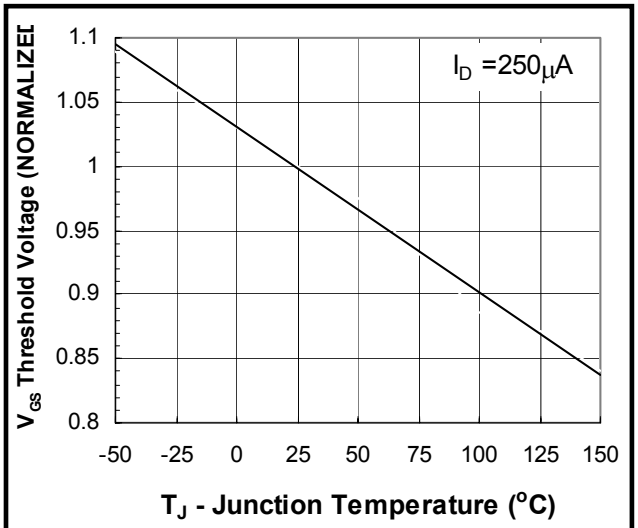


Fig. 5. Threshold Voltage vs. Temperature

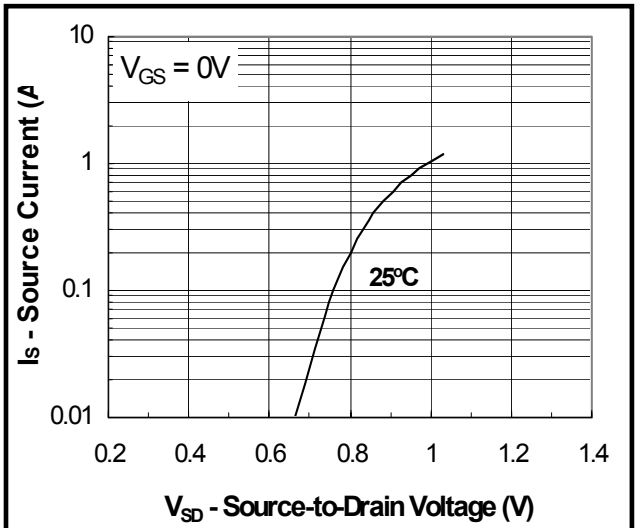


Fig. 6. Sourse-Drain Diode Forward Voltage

Electrical Characteristic Curves - P-Channel - Q_2 , BSS84 T_J = 25°C Unless otherwise noted

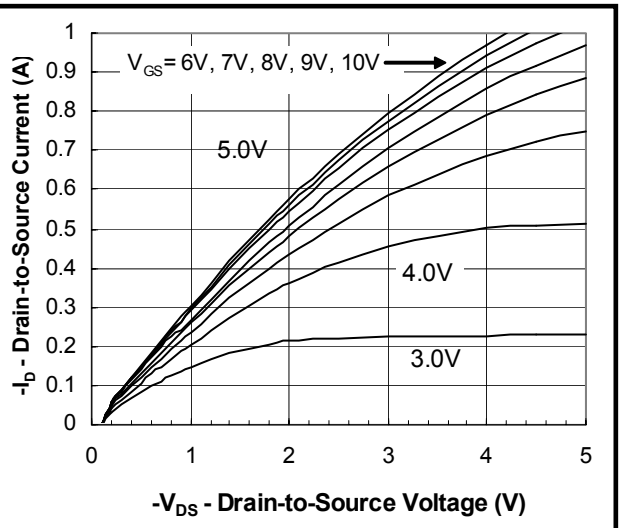


Fig. 1. Output Characteristics

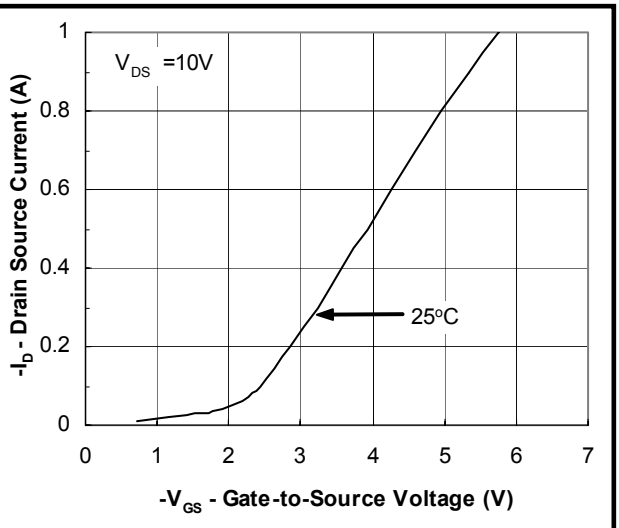


Fig. 2. Transfer Characteristics

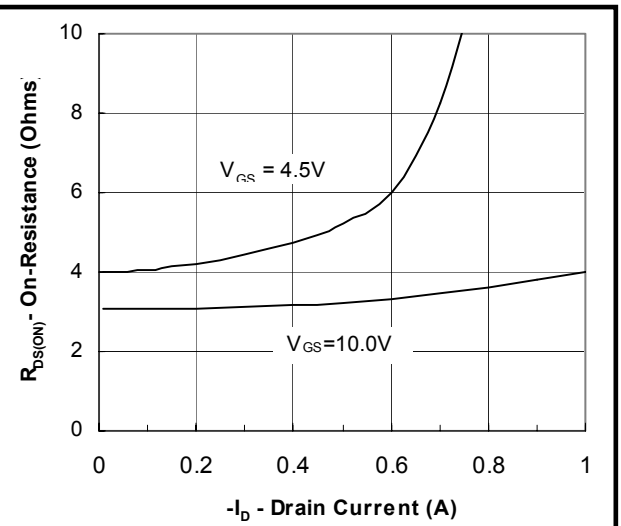


Fig. 3. On-Resistance vs. Drain Current

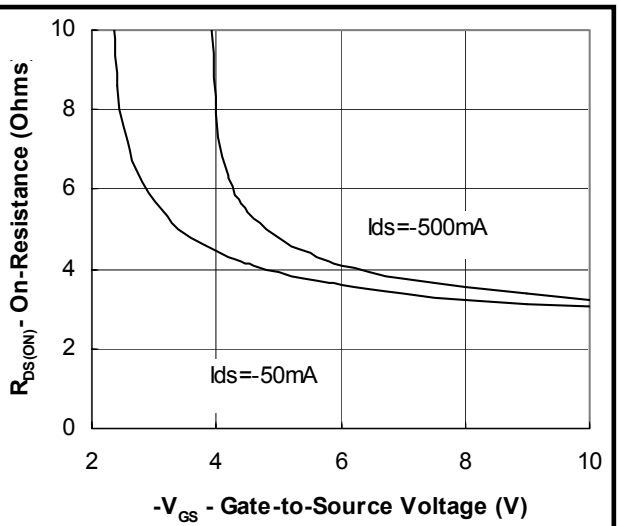


Fig. 4. On-Resistance vs. G-S Voltage

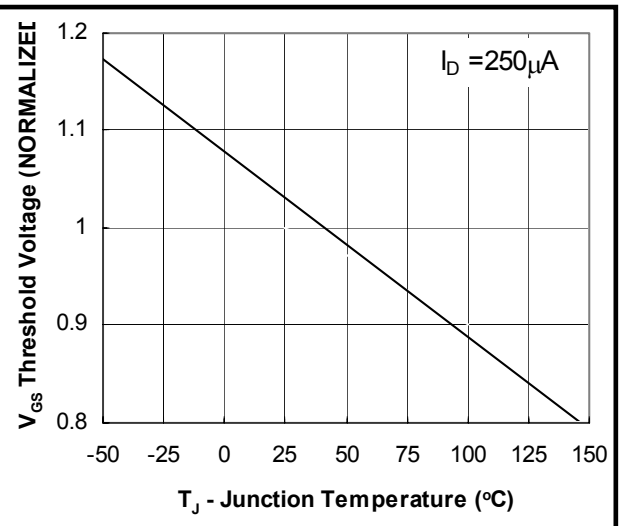


Fig. 5. Threshold Voltage vs. Temperature

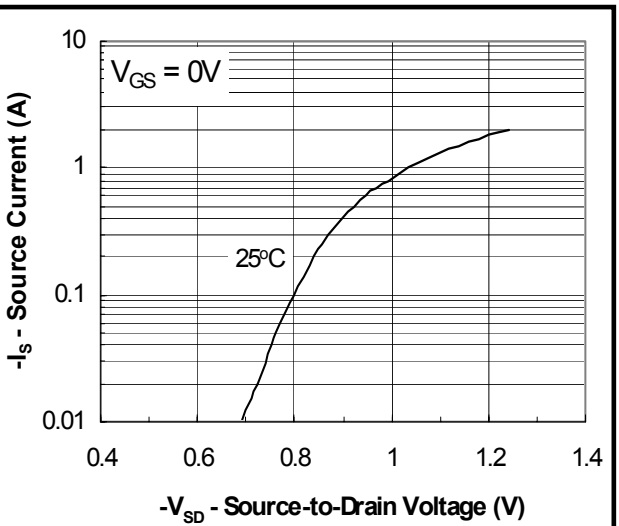
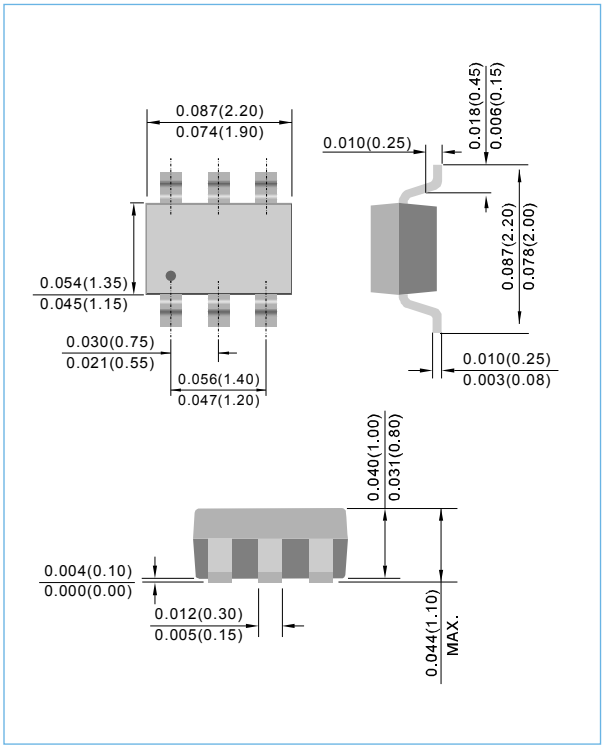


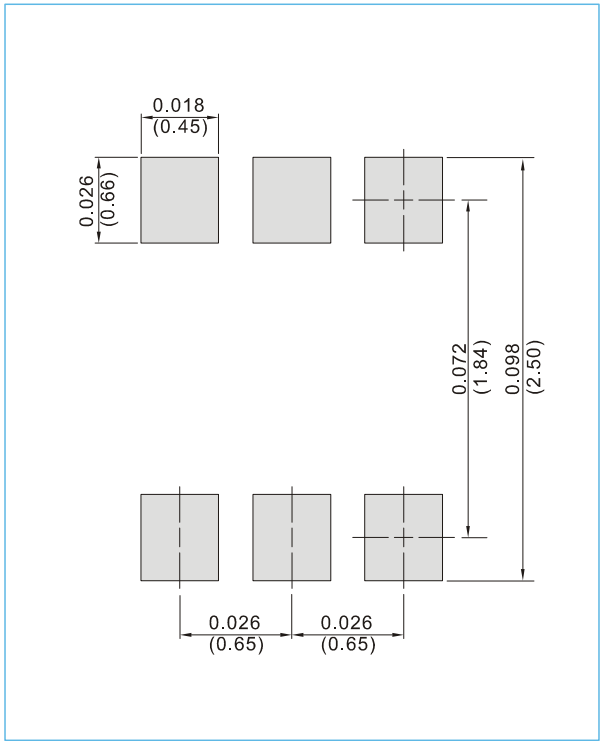
Fig. 6. Sourse-Drain Diode Forward Voltage

PACKAGE LAYOUT AND SUGGESTED PAD DIMENSIONS

SOT-363 Unit : inch(mm)



SOT-363 Unit : inch(mm)



ORDERING INFORMATION

BSS8402DW T/R7: 7 inch reel, 3K units per reel, Pin 1 towards tape sprocket holes

BSS8402DW T/R7-R: 7 inch reel, 3K units per reel, Pin 1 away from tape sprocket holes

BSS8402DW T/R13: 13 inch reel, 10K units per reel, Pin 1 towards tape sprocket holes

BSS8402DW T/R13-R: 13 inch reel, 10K units per reel, Pin 1 away from tape sprocket holes

BSS8402DW

Part No_packing code_Version

BSS8402DW_R1_00001
BSS8402DW_R2_00001

For example :

RB500V-40_R2_00001

- Part No.
- Packing type means T/R
- Packing size code means 13"
- Version code means HF
- Serial number

Packing Code XX				Version Code XXXXX		
Packing type	1st Code	Packing size code	2nd Code	HF or RoHS	1st Code	2nd~5th Code
Tape and Ammunition Box (T/B)	A	N/A	0	HF	0	serial number
Tape and Reel (T/R)	R	7"	1	RoHS	1	serial number
Bulk Packing (B/P)	B	13"	2			
Tube Packing (T/P)	T	26mm	X			
Tape and Reel (Right Oriented) (TRR)	S	52mm	Y			
Tape and Reel (Left Oriented) (TRL)	L	PANASERT T/B CATHODE UP (PBCU)	U			
FORMING	F	PANASERT T/B CATHODE DOWN (PBCD)	D			

BSS8402DW

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