

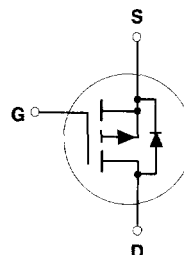
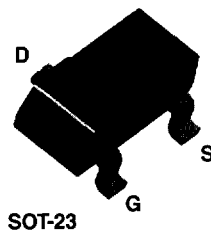
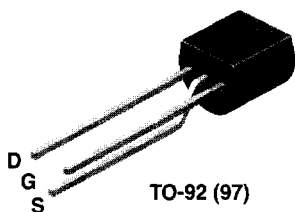
BSS84 / BSS110 P-Channel Enhancement Mode Field Effect Transistor

General Description

These P-Channel enhancement mode power field effect transistors are produced using Fairchild's proprietary, high cell density, DMOS technology. This very high density process is designed to minimize on-state resistance, provide rugged and reliable performance and fast switching. They can be used, with a minimum of effort, in most applications requiring up to 0.17A DC and can deliver pulsed currents up to 0.68A. This product is particularly suited to low voltage applications requiring a low current high side switch.

Features

- BSS84: -0.13A, -50V. $R_{DS(ON)} = 10\Omega @ V_{GS} = -10V$.
BSS110: -0.17A, -50V. $R_{DS(ON)} = 10\Omega @ V_{GS} = -10V$
- Voltage controlled p-channel small signal switch.
- High density cell design for low $R_{DS(ON)}$.
- High saturation current.



Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	BSS84	BSS110	Units
V_{DSS}	Drain-Source Voltage		-50	V
V_{DGR}	Drain-Gate Voltage ($R_{GS} \leq 20\text{ K}\Omega$)		-50	V
V_{GSS}	Gate-Source Voltage - Continuous		± 20	V
I_D	Drain Current - Continuous @ $T_A = 30/35^\circ\text{C}$	-0.13	-0.17	A
	- Pulsed @ $T_A = 25^\circ\text{C}$	-0.52	-0.68	
P_D	Maximum Power Dissipation $T_A = 25^\circ\text{C}$	0.36	0.63	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 150		$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/16" from case for 10 seconds	300		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Symbol	Parameter	BSS84	BSS110	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	350	200	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted)							
Symbol	Parameter	Conditions	Type	Min	Typ	Max	Units
OFF CHARACTERISTICS							
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = -250 μA	All	-50			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -50 V, V _{GS} = 0 V	All			-15	μA
						-60	μA
		V _{DS} = -25 V, V _{GS} = 0 V				-0.1	μA
I _{GSSR}	Gate - Body Leakage, Reverse	V _{GS} = -20 V, V _{DS} = 0 V	All			-10	nA
ON CHARACTERISTICS (Note 1)							
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -1 mA	All	-0.8	-1.75	-2	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = -10 V, I _D = -0.13 A	BSS84		2.3	10	Ω
		V _{GS} = -10 V, I _D = -0.17 A	BSS110		2.2	10	
g _{FS}	Forward Transconductance	V _{DS} = -10 V, I _D = -0.13 A	BSS84	0.05	0.27		S
		V _{DS} = -10 V, I _D = -0.17 A	BSS110	0.05	0.29		
DYNAMIC CHARACTERISTICS							
C _{iss}	Input Capacitance	V _{DS} = -25 V, V _{GS} = 0 V, f = 1.0 MHz	BSS84		37	45	pF
			BSS110		37	40	
C _{oss}	Output Capacitance		All		16	25	pF
C _{rss}	Reverse Transfer Capacitance		All		5	12	pF
SWITCHING CHARACTERISTICS (Note 1)							
t _{D(on)}	Turn - On Delay Time	V _{DD} = -30 V, I _D = -0.27 A, V _{GS} = -10 V, R _{GEN} = 50 Ω	All			12	nS
t _r	Turn - On Rise Time		All			50	nS
t _{D(off)}	Turn - Off Delay Time		All			10	nS
t _f	Turn - Off Fall Time		All			25	nS
DRAIN-SOURCE DIODE CHARACTERISTICS							
I _S	Continuous Source Diode Current		BSS84			-0.13	A
			BSS110			-0.17	
I _{SM}	Maximum Pulsed Source Diode Current (Note 1)		BSS84			-0.52	A
			BSS110			-0.68	
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = -0.26 A (Note 1)	BSS84		-0.95	-1.2	V
		V _{GS} = 0 V, I _S = -0.34 A (Note 1)	BSS110		-1	-1.2	

Note:
1 Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

Typical Electrical Characteristics

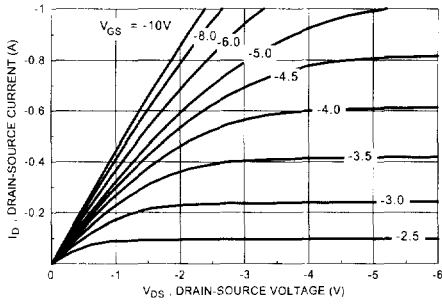


Figure 1. On-Region Characteristics.

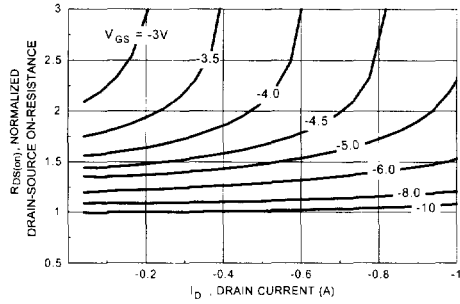


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

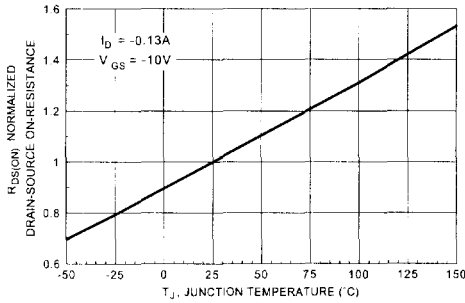


Figure 3. On-Resistance Variation with Temperature.

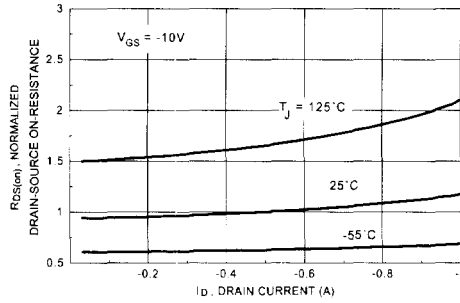


Figure 4. On-Resistance Variation with Drain Current and Temperature.

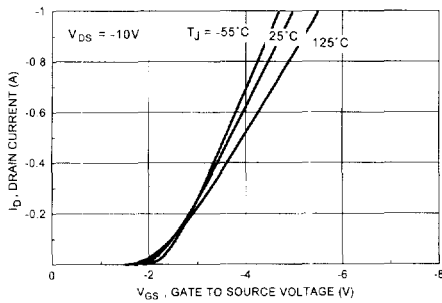


Figure 5. Transfer Characteristics.

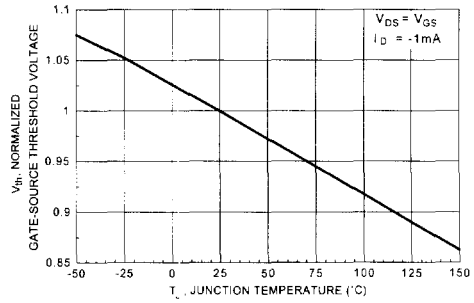


Figure 6. Gate Threshold Variation with Temperature.

Typical Electrical Characteristics (continued)

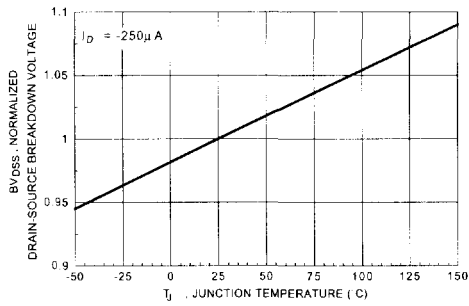


Figure 7. Breakdown Voltage Variation with Temperature.

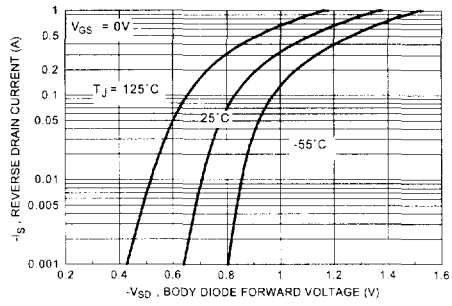


Figure 8. Body Diode Forward Voltage Variation with Source Current and Temperature.

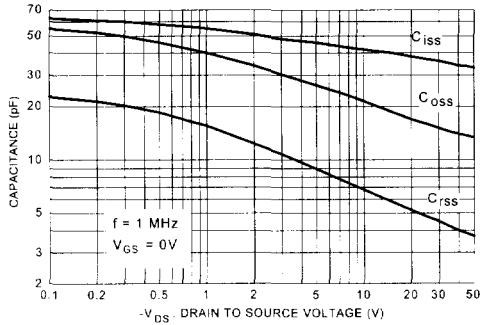


Figure 9. Capacitance Characteristics.

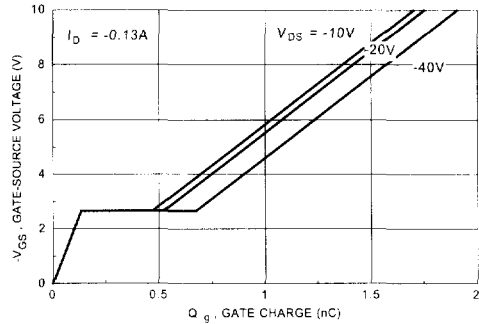


Figure 10. Gate Charge Characteristics.

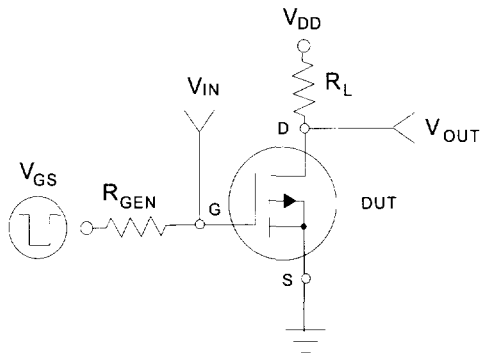


Figure 11. Switching Test Circuit.

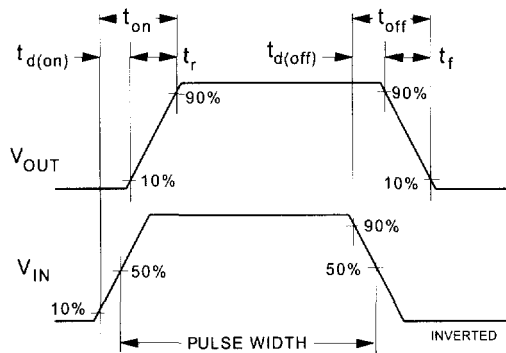


Figure 12. Switching Waveforms.

Typical Electrical Characteristics (continued)

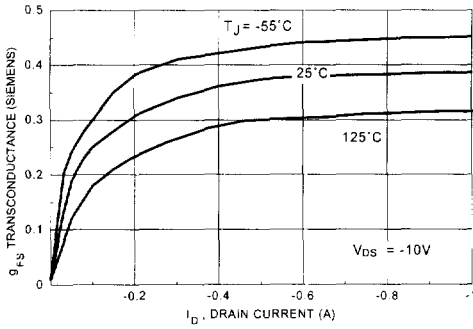


Figure 13. Transconductance Variation with Drain Current and Temperature.

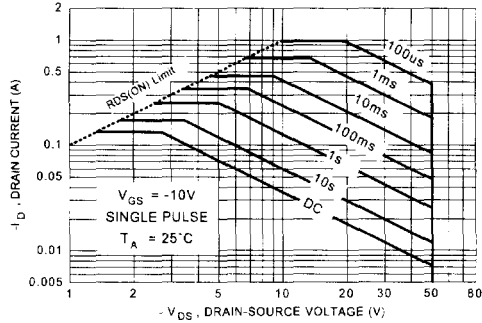


Figure 14. Maximum Safe Operating Area.

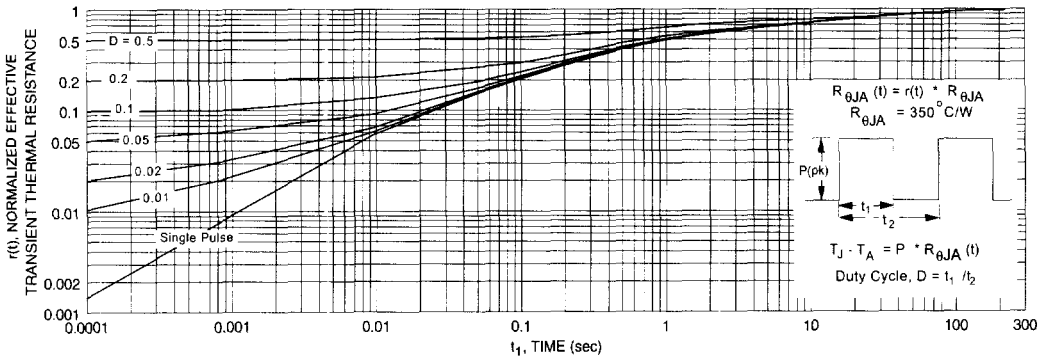


Figure 15. Transient Thermal Response Curve.

Note : Characterization performed using a circuit board with 175°C/W typical case-to-ambient thermal resistance.