BCF95N190M2

N-Channel Silicon Carbide Power MOSFET

950 V, 18 A, 190 mΩ

bestirpower

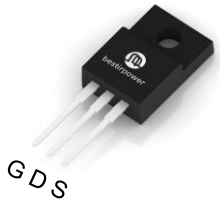
Features

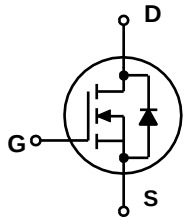
- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Fast Intrinsic Diode With Low Reverse Recovery
- Low Switching Losses

BV_{DSS}	$I_{D,\ Tc=25℃}$	$R_{DS(on),typ}$	$Q_{g,typ}$
950 V	18A	190 mΩ	15.3 nC

Applications

- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Uninterruptable Power Supplies
- EV Battery Chargers
- Solar/Wind Inverters





Absolute Maximum Ratings (T_J = 25℃ unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to Source Voltage		950	V
V_{GS}	Gate to Source Voltage (DC)		-10 / +22	V
V_{GSop}	Recommended Operation Value		0/15	V
I_D	Drain Current	V_{GS} = 15 V, (T_C = 25℃)	18	A
		V_{GS} = 15 V,(T_C = 100℃)	12.8	
I_{DM}	Drain Current	Pulsed	36	A
P_D	Power Dissipation	(T_C = 25℃)	54	W
E_{AS}	Single Pulse Avalanche Energy	V_{DD}=50V,V_{GS}=15V,L=0.5mH ,I_{AS}=11.5A	33.4	mJ
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to 175	℃

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	1.98	℃/W
Tsold	Soldering temperature, wave soldering only allowed at leads	260	℃

Electrical Characteristics (T_J = 25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS} = 0 V, I_D = 100 uA	950	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 950 V, V_{GS} = 0 V	-	0.1	20	μA
I_{GSS}	Gate-Source Leakage Current	V_{DS} = 0 V, V_{GS} = + 22 V	-	-	+250	nA
I_{GSS}	Source-Gate Leakage Current	V_{DS}= 0 V, V_{GS}= - 10 V	-250	-	-	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_{DS} = 10 mA, T_J = 25˚C	-	3.9	-	V
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 12 V, I_D = 7 A	-	350	-	mΩ
		V_{GS} = 12 V, I_D = 7A, T_J = 175℃	-	218	-	
		V_{GS} = 18 V, I_D = 7 A	-	190	215	
		V_{GS} = 18 V, I_D = 7A, T_J = 175℃	-	163	-	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 950 V, f = 1MHz	-	431	-	pF
C_{oss}	Output Capacitance		-	30	-	
C_{rss}	Reverse Capacitance		-	3	-	
$Q_{g(tot)}$	Total Gate Charge	V_{DS} = 400 V, I_D = 7 A, V_{GS} = 0V / 15 V	-	15.3	-	nC
Q_{gs}	Gate to Source Charge		-	5.5	-	
Q_{gd}	Gate to Drain “Miller” Charge		-	2.6	-	
R_G	Internal Gate Resistance	f = 1MHz,V_{AC} = 25 mV	-	36	-	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{GS} = 0/15 V, L=600 μH V_{DS} = 400 V, I_D = 7 A, $R_{G(on)}$ = 2.2 Ω, $R_{G(off)}$ = 2.2 Ω	-	29.2	-	ns
t_r	Turn-On Rise Time		-	11.7	-	
$t_{d(off)}$	Turn-Off Delay Time		-	46.1	-	
t_f	Turn-Off Fall Time		-	16.5	-	
E_{on}	Turn-On Switching Energy		-	67.8	-	μJ
E_{off}	Turn-Off Switching Energy		-	15	-	
Source-Drain Diode Characteristics						
I_S	Continuous Diode Forward Current	T_C = 25˚C	-	13.5	-	A
		T_C = 100˚C	-	7.7	-	
V_{SD}	Diode Forward Voltage	V_{GS} = 0 V, I_{SD} = 3.5 A	-	3.3	-	V
t_{rr}	Reverse Recovery Time	V_{DS} = 400 V, V_{GS} = 0 V, I_{SD} =7 A, di/dt = 2000A/μs	-	26	-	ns
Q_{rr}	Reverse Recovery Charge		-	68	-	nC
I_{rrm}	Peak Reverse Recovery Current		-	6.9	-	A

Typical Performance Characteristics

Figure 1: Safe Operating Area (Single Pulse,Tvj=25℃)

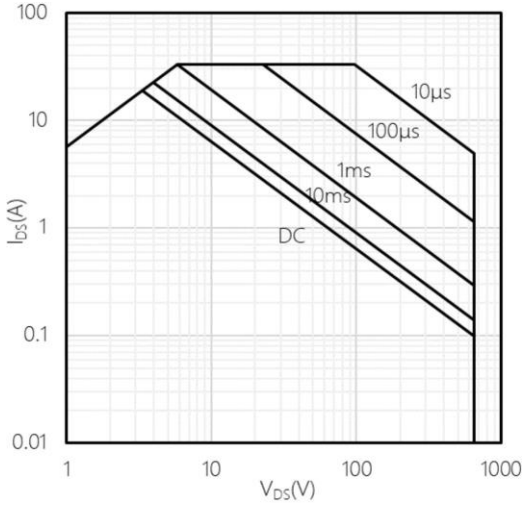


Figure 2: Power Dissipation as a Function of Case Temperature Limited by Bond Wire

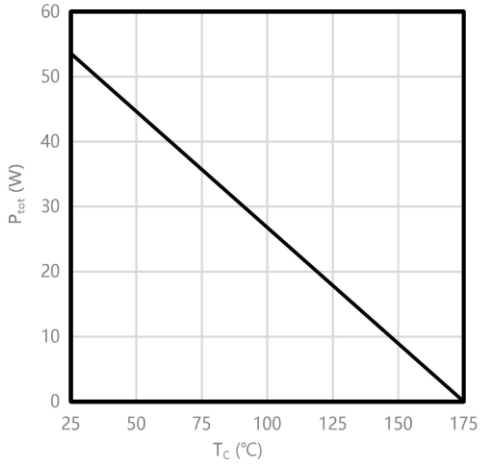


Figure 3 Typical Output Characteristic, VGS as Parameter Tv=-55 ℃

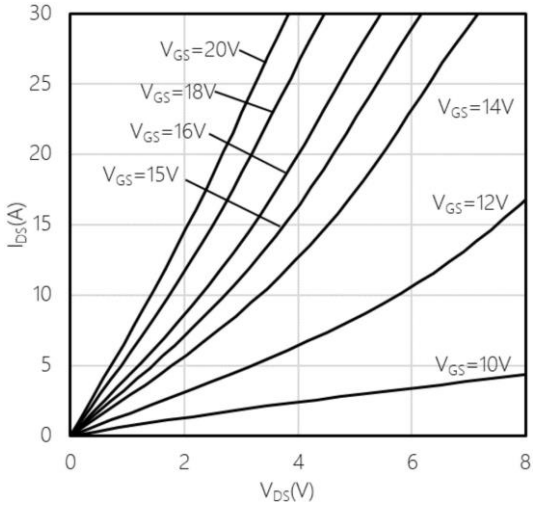


Figure 4 Typical Output Characteristic, VGS as Parameter Tv=25 ℃

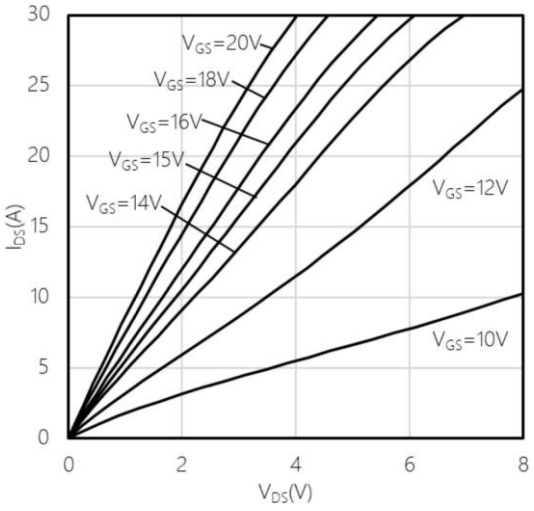


Figure 5 Typical Output Characteristic, VGS as Parameter Tv=175 ℃

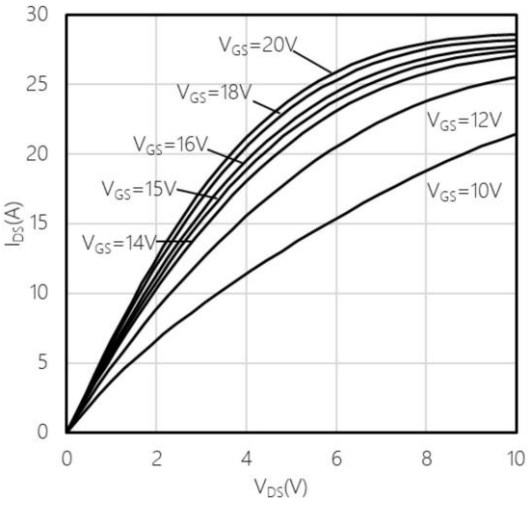
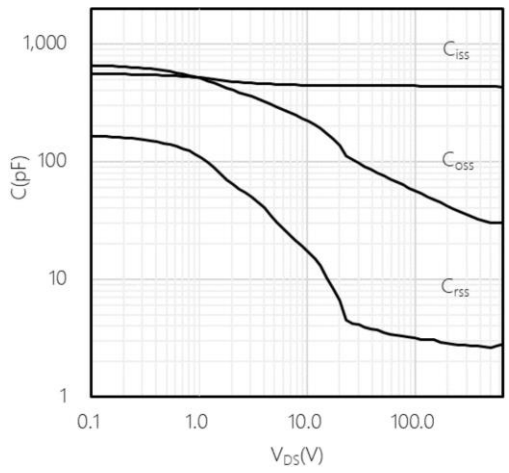


Figure 6: Typical Capacitance as a Function of Drain-Source Voltage (VGS=0V,f=1MHz)



Typical Performance Characteristics

Figure 7: Typical Switching Energy Losses as a Function of VDS
(VGS=0/15V,Tvj=175℃, RG(ext)=2.2Ω,IDS=7A)

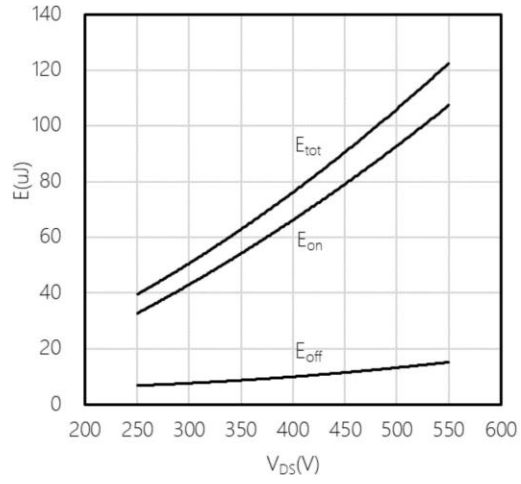


Figure 8: Typical Gate Charge (VDS=400V,IDS=7A)

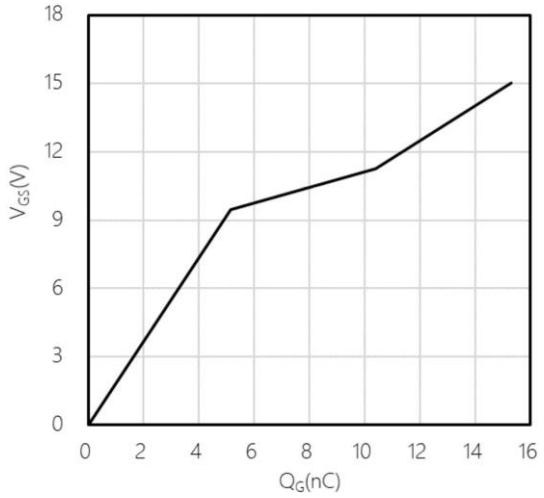


Figure 9:Typical Transfer Characteristic (VDS=20V)

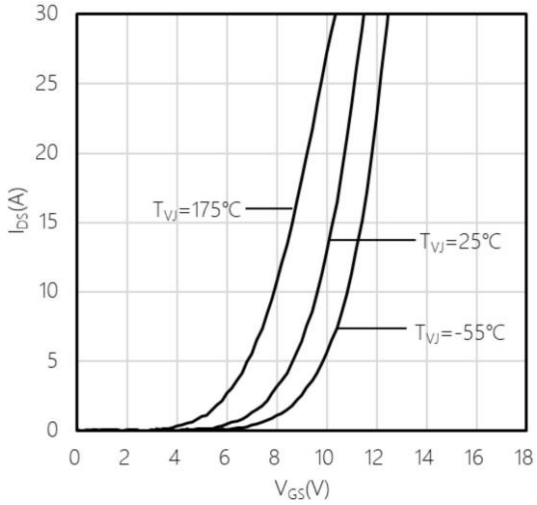


Figure 10: Threshold Voltage vs Temperature (IDS=10mA)

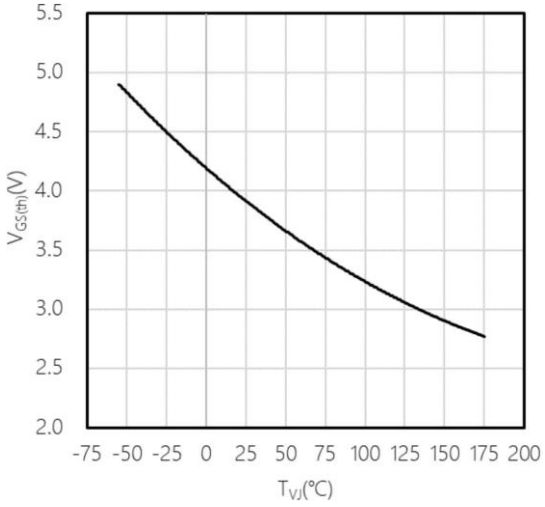


Figure 11 Typical Reverse Drain Current as Function of Reverse Drain Voltage, VGS as Parameter Tv=-55 ℃

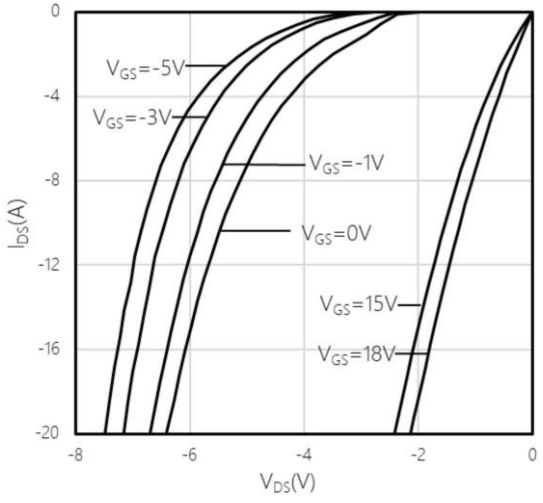
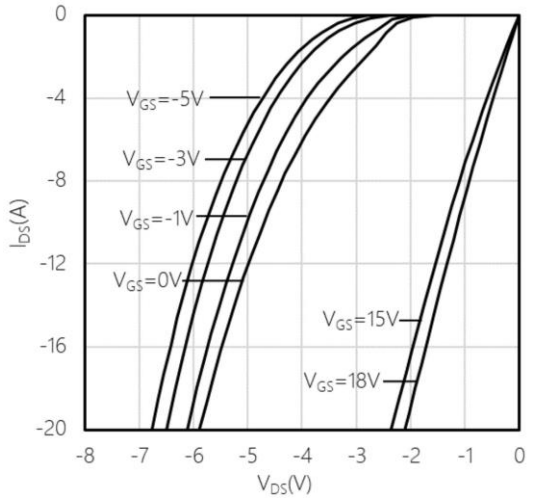


Figure 12 Typical Reverse Drain Current as Function of Reverse Drain Voltage, VGS as Parameter Tv=25 ℃



Typical Performance Characteristics

Figure 13: Typical Reverse Drain Current as Function of Reverse Drain Voltage, VGS as Parameter
(Tvj=175℃)

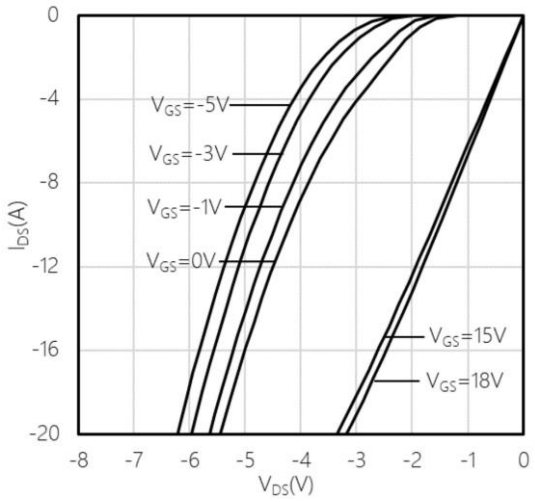


Figure 14: Typical Reverse Drain Voltage as Function of Junction Temperature
(ISD=3.5A)

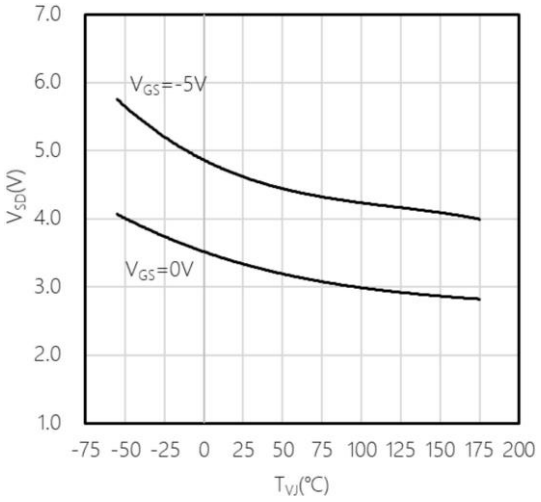


Figure 15: Typical Switching Energy as a Function of Junction Temperature
(VGS=0/18V,VDS=400V,RG(ext)=2.2Ω,IDS=7A)

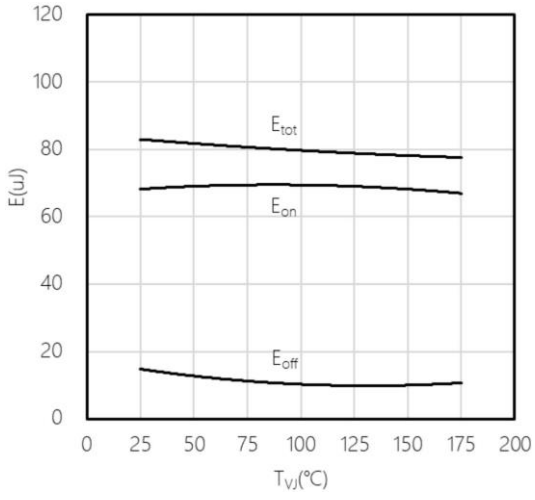


Figure 16: Typical Switching Energy as a Function of Junction Temperature
(VGS=0/18V,VDS=400V,Tvj=25℃, IDS=7A)

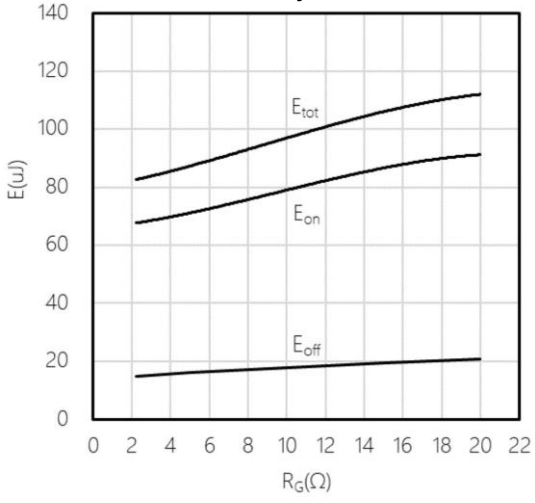


Figure 17: Typical Switching Energy Losses as a Function of Gate Resistance
(VGS=0/18V,VDS=400V,Tvj=175℃, IDS=7A)

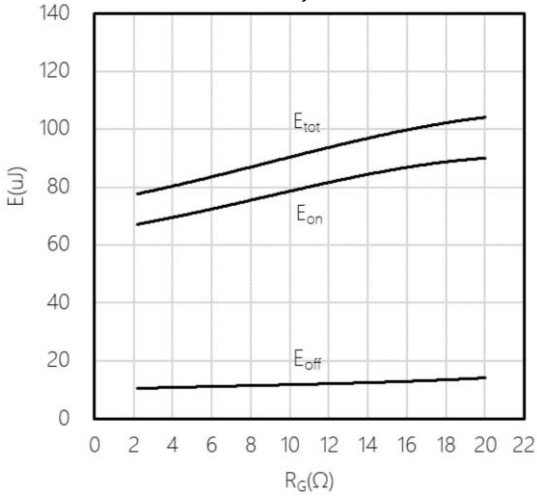
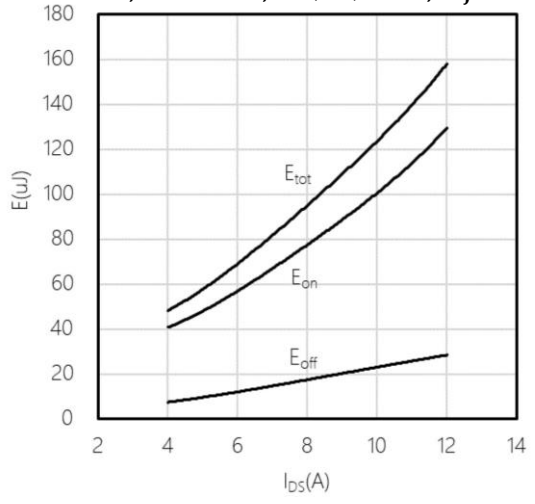


Figure 18: Typical Switching Energy Losses as a Function of IDS
(VGS=0/18V,VDS=400V,RG(ext)=2.2Ω,Tvj=25℃)



Typical Performance Characteristics

Figure19: Typical Switching Energy Losses as a Function of IDS

(VGS=0/18V,VDS=400V,Tvj=175℃, RG(ext)=2.2Ω)

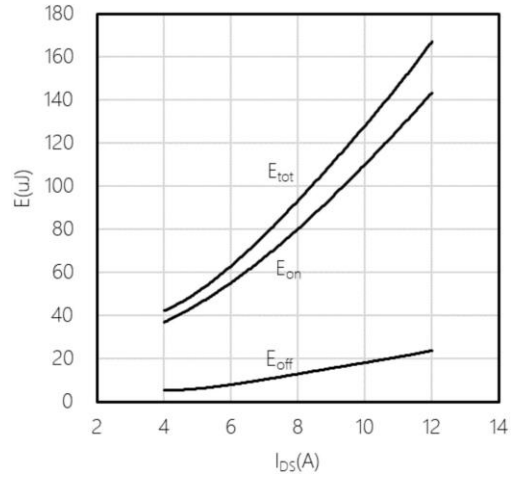
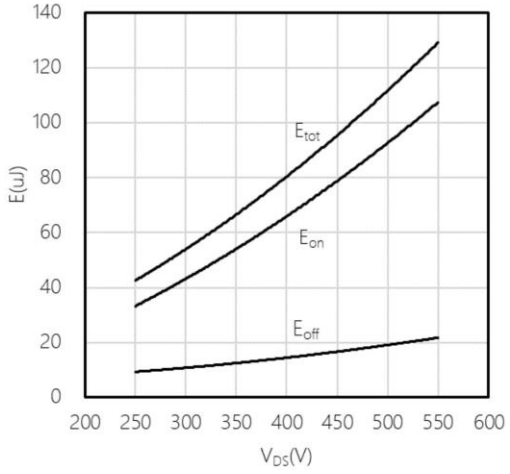


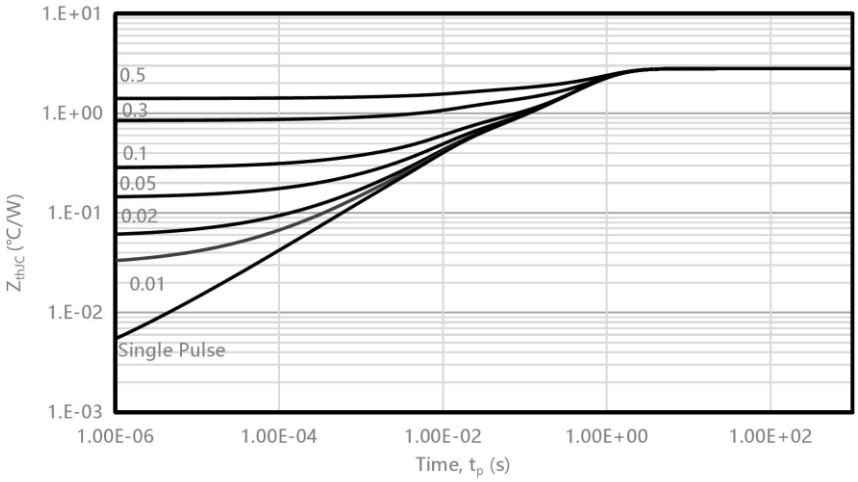
Figure 20: Typical switching energy losses as a function of VDS

(VGS=0/18V,Tvj=25℃, RG(ext)=2.2Ω,IDS=7A)



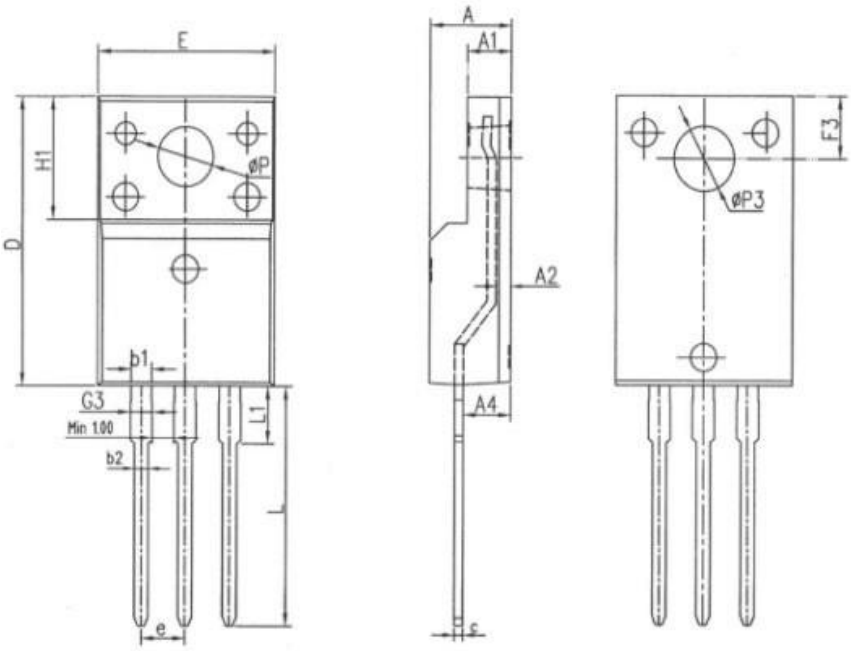
Typical Performance Characteristics

Figure 21：Transient thermal resistance (MOSFET)



Package Outlines

TO-220F



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
E	10.00	10.20	10.40
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.65	0.85	1.30
A4	2.55	2.75	2.95
c	0.40	0.50	0.65
D	15.57	15.87	16.17
H1	6.70REF		
e	2.54BSC		
ΦP	3.183REF		
L	12.68	12.98	13.28
L1	3.25	3.45	3.65
ΦP3	3.45REF		
F3	3.10	3.30	3.50
G3	1.10	1.30	1.50
b1	1.05	1.20	1.35
b2	0.70	0.80	0.92

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BCF95N190M2	BCF95N190M2	TO-220F	Tube	50 units

Disclaimer

Bestirpower reserve the right to make changes, corrections, enhancements, modifications, and improvements to Bestirpower products and/or to this document at any time without notice.

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Bestirpower does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Products or technical information described in this document.

This document is the property of Bestirpower Co,. LTD., and not allowed to copy or transformed to other format if not under the authority approval.

© 2026 Bestirpower – All rights reserved