

60V N-Channel Trench Power MOSFET

General Description

The EJP60N100 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a wide variety of applications.

Features

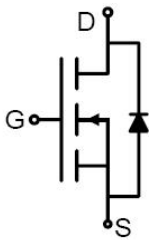
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

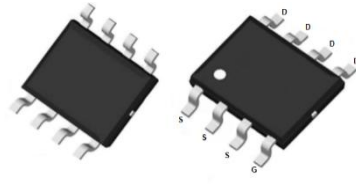
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(ON_TYP)}$	9.5	m Ω
I_D	9.5	A
Q_G	13.9	nC



Schematic Diagram



SOP-8 top&bottom view



Package Marking and Ordering Information

Device/Ordering Code	Package	Packing	Reel Size	Tape width	Quantity
EJP60N100	SOP-8	Tape	\	\	4000 Pcs

Table 1. Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	60	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous ($T_A=25^{\circ}\text{C}$)	9.5	A
	Drain Current-Continuous ($T_A=100^{\circ}\text{C}$)	6	A
$I_{DM} \text{ (pulse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	38	A
P_D	Maximum Power Dissipation ($T_A=25^{\circ}\text{C}$)	2.3	W
	Maximum Power Dissipation ($T_A=100^{\circ}\text{C}$)	0.9	W
E_{AS}	Avalanche energy (Note 2)	169	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^{\circ}\text{C}$

EJP60N100

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		54.6	°C/W

Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V T _J =25℃			1	uA
		V _{DS} =60V, V _{GS} =0V T _J =125℃			500	nA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1		2.5	V
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A		35		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A T _J =25℃		9.5	11.9	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =15A T _J =25℃		11.5	15.3	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =30V,V _{GS} =0V, f=1.0MHz		2411		pF
C _{oss}	Output Capacitance			124		pF
C _{rss}	Reverse Transfer Capacitance			116		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		1.4		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =30V, R _L =1.5Ω, R _{GEN} =6Ω		4.3		ns
t _r	Turn-on Rise Time			16		ns
t _{d(off)}	Turn-Off Delay Time			6.5		ns
t _f	Turn-Off Fall Time			24		ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =20A		47.5		nC
Q _{gs}	Gate-Source Charge			14.5		nC
Q _{gd}	Gate-Drain Charge			12.7		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				9.5	A
V _{SD}	Forward on Voltage ^(Note 3)	V _{GS} =0V, I _S =20A			0.99	V
t _{rr}	Reverse Recovery Time	I _F =20A, dI/dt=100A/μs		24		ns
Q _{rr}	Reverse Recovery Charge	I _F =20A, dI/dt=100A/μs		9.3		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAs condition: $T_J=25^{\circ}\text{C}, V_{DD}=40V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

EJP60N100

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

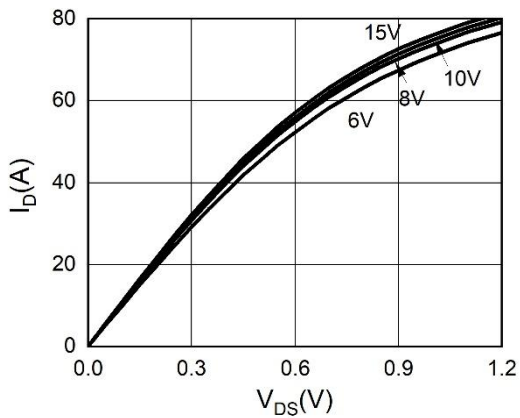


Figure 2. Transfer Characteristics

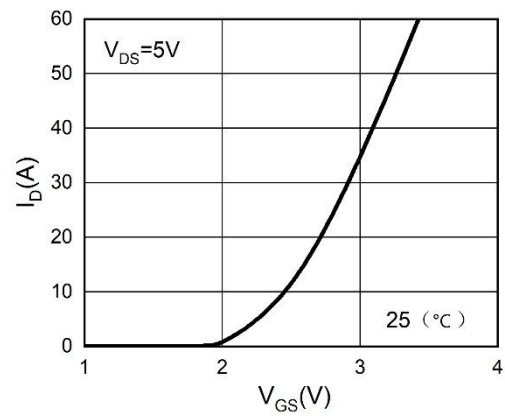


Figure 3. Power Dissipation

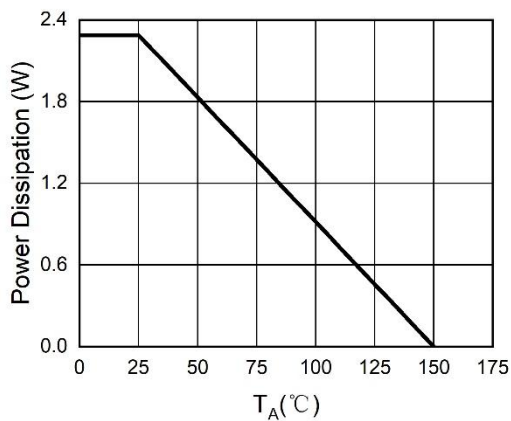


Figure 4. Drain Current

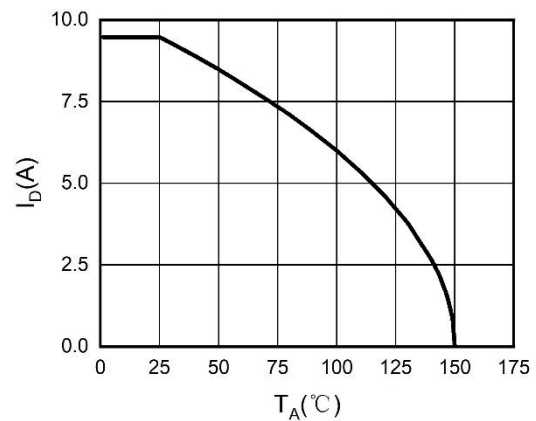


Figure 5. BV_{DSS} vs Junction Temperature

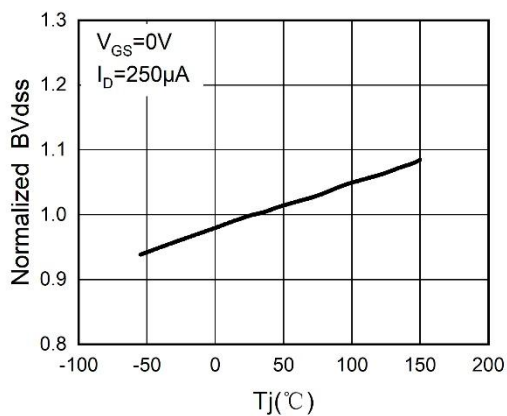
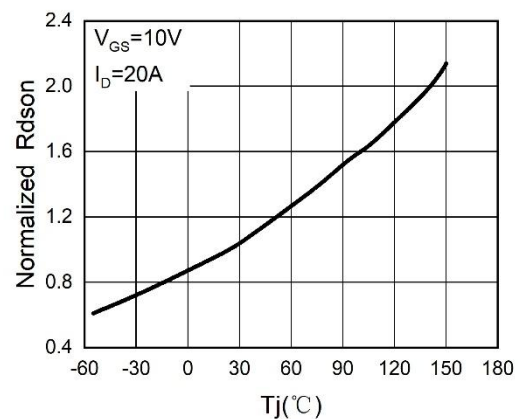


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



EJP60N100

Typical Electrical And Thermal Characteristics (Curves)

Figure 7. Gate Charge Waveforms

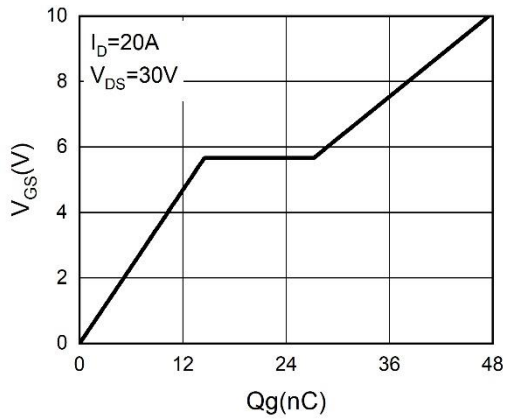


Figure 8. Capacitance

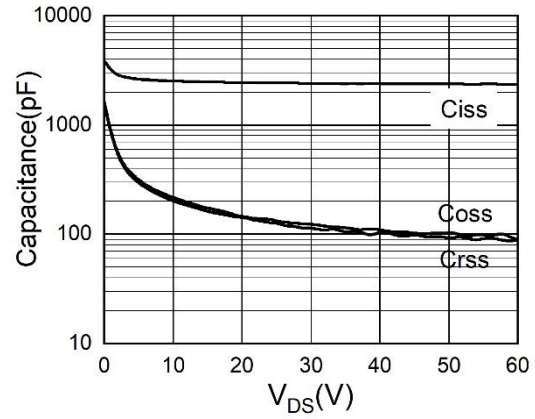


Figure 9. Body-Diode Characteristics

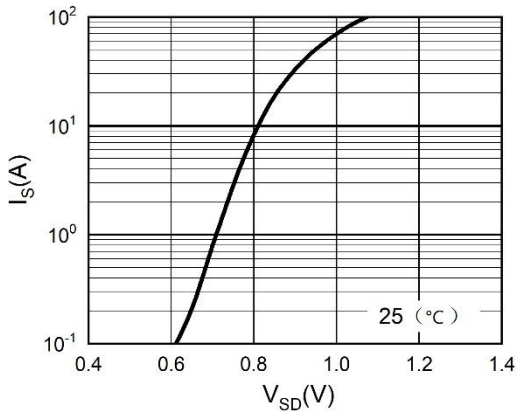
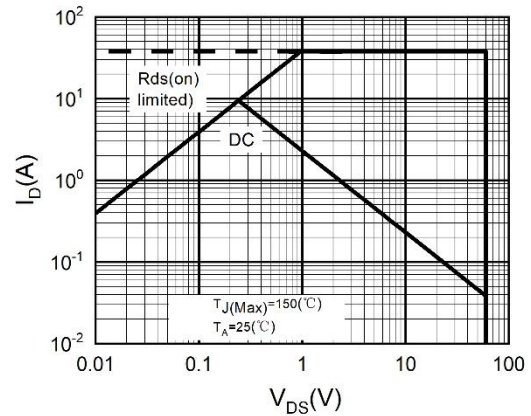
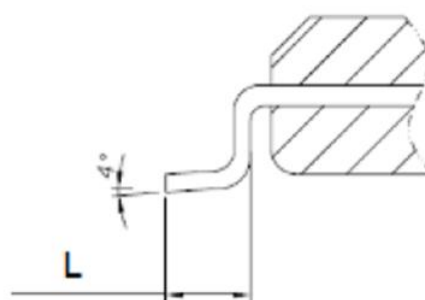
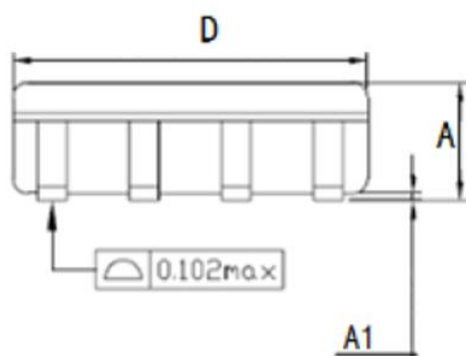
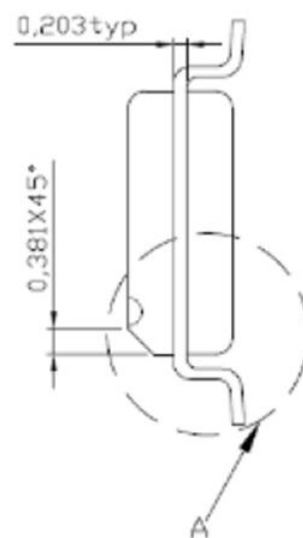
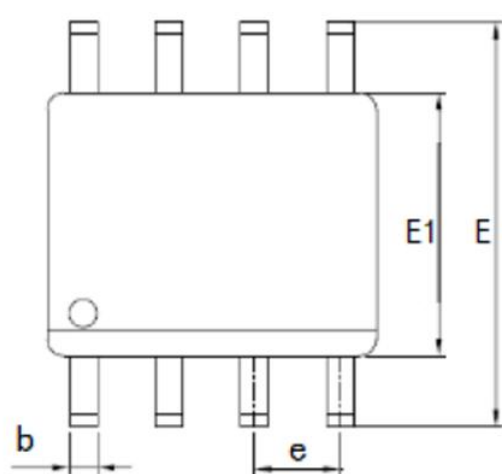


Figure 10. Maximum Safe Operating Area



EJP60N100

SOP-8 Package Information



A 局部放大

Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	1.35	1.55	1.75
A1	0.1	0.15	0.2
b	0.346	0.406	0.466
D	4.8	4.89	4.98
E	5.75	6.00	6.25
E1	3.81	3.90	3.99
e	1.27 TYP		
L	0.406	0.838	1.27