EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	IRFP4332
Overseas Part Number	IRFP4332
Equivalent Part Number	IRFP4332

600V N-SJ Enhancement Mode MOSFET

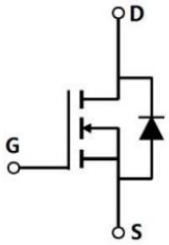
General Description

This Power MOSFET is produced using Msemitek's advanced Superjunction MOSFET technology.
This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies.

Features

- 650V@T_j=150℃
- 80A,600V, $R_{DS(on)}$ =25mΩ@V_{GS} = 10 V
- Low gate charge(typ. Qg =173nC)
- High ruggedness
- Ultra fast switching
- 100% avalanche tested
- Improved dv/dt capability

TO-247 Pin Configuration



Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	JCW60R025P	Units
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current * - Continuous (T_C = 25℃)	80	A
	- Continuous (T_C = 100℃)	50	A
I_{DM}	Drain Current * - Pulsed (Note 1)	240	A
V_{GSS}	Gate-Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	908	mJ
P_D	Power Dissipation (T_C = 25℃)	521	W
	- Derate above 25℃	4.17	W/℃
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	℃
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	260	℃

* Drain current limited by maximum junction temperature.

Thermal Characteristics

Symbol	Parameter	JCW60R025P	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.24	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	℃/W

Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 uA	600	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 600 V, V_{GS} = 0 V	--	--	10	uA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V	-100	--	--	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 uA	3	--	5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10V, I_D = 40A	--	25	29	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =100 V, V_{GS} = 0 V, f = 100KHz	--	8730	--	pF
C_{oss}	Output Capacitance		--	167	--	pF
C_{rss}	Reverse Transfer Capacitance		--	1.5	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 400V, I_D = 40A, R_G = 4.7Ω, V_{GS} = 10V (Note3)	--	136	--	ns
t_r	Turn-On Rise Time		--	50	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	194	--	ns
t_f	Turn-Off Fall Time		--	7	--	ns
Q_g	Total Gate Charge	V_{DS} =400V, I_D =40A, V_{GS} =10V (Note3)	--	173	--	nC
Q_{gs}	Gate-Source Charge		--	47	--	nC
Q_{gd}	Gate-Drain Charge		--	63	--	nC
R_G	Gate Resistance	f =1MHz	--	7.5	--	Ω

Drain-Source Diode Characteristics and Maximum Ratings

I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	80	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	240	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 40A	--	--	1.2	V
t_{rr}	Reverse Recovery Time	V_{DS} =400 V, I_S = 40A, dI_F / dt = 126A/us	--	179	--	ns
Q_{rr}	Reverse Recovery Charge		--	1.7	--	uC

Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J =25℃, V_{DD} =80V, V_G =10V, L=30mH,
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Electrical Characteristics Diagrams

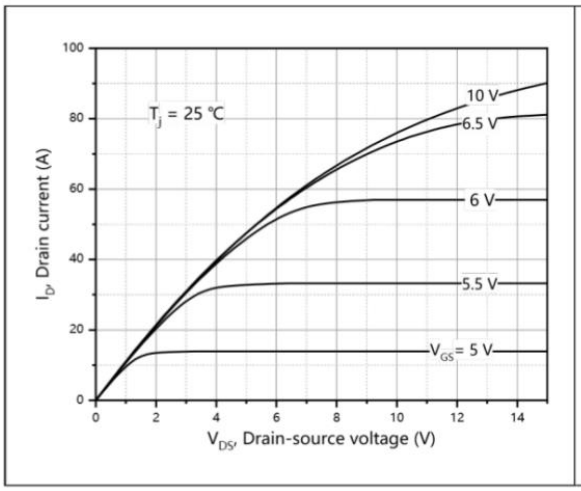


Figure 1, Typ. output characteristics

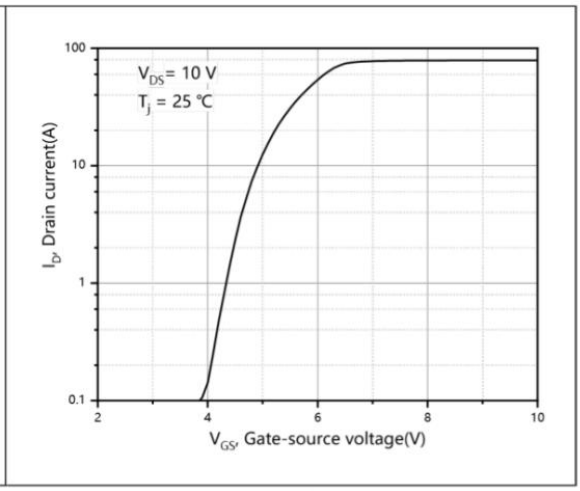


Figure 2, Typ. transfer characteristics

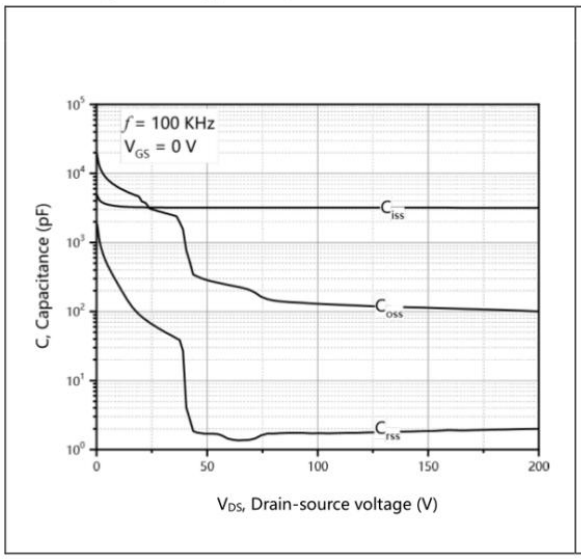


Figure 3, Typ. capacitances

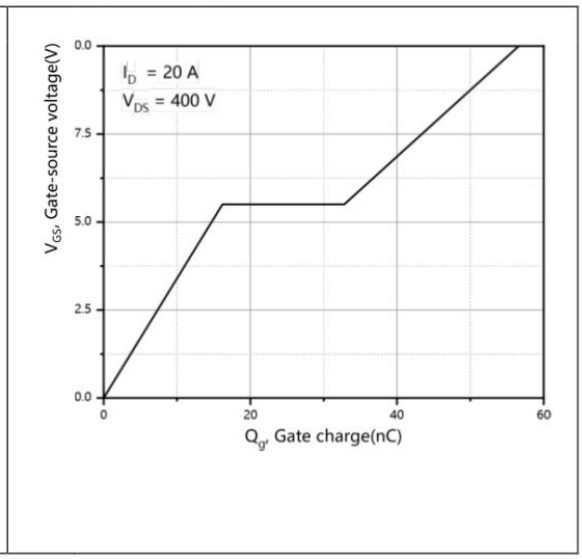


Figure 4, Typ. gate charge

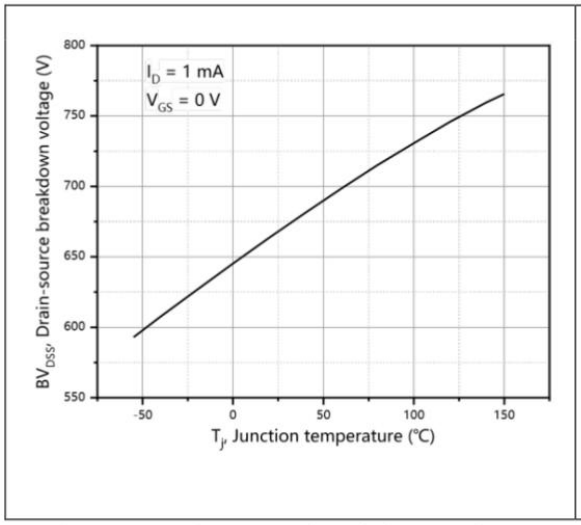


Figure 5, Drain-source breakdown voltage

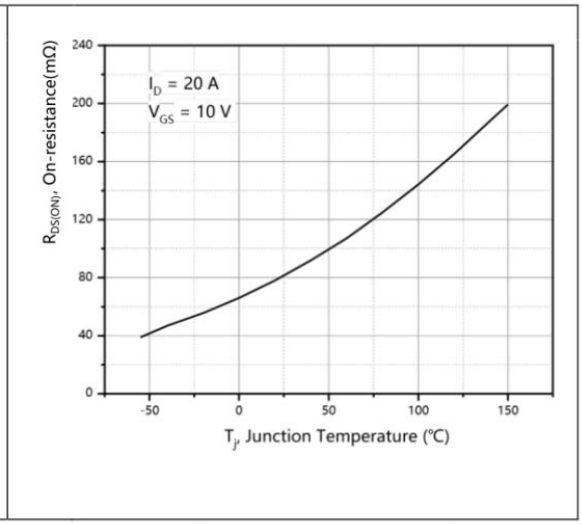


Figure 6, Drain-source on-state resistance

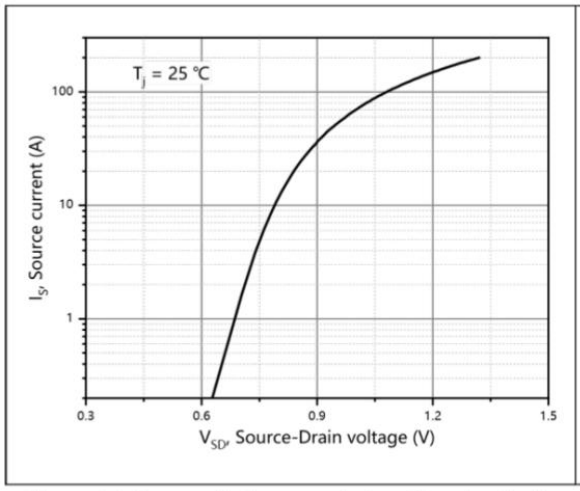


Figure 7, Forward characteristic of body diode

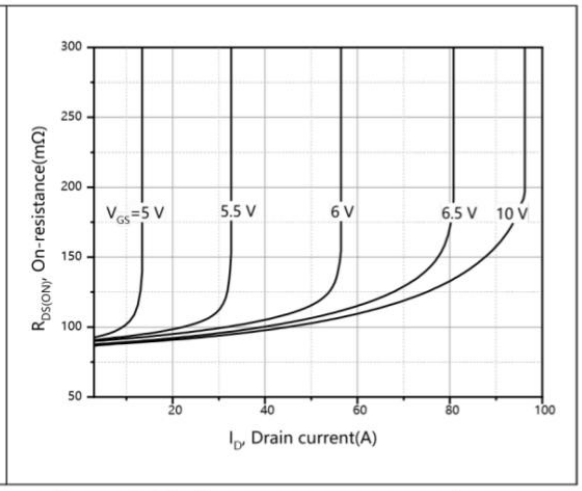


Figure 8, Drain-source on-state resistance

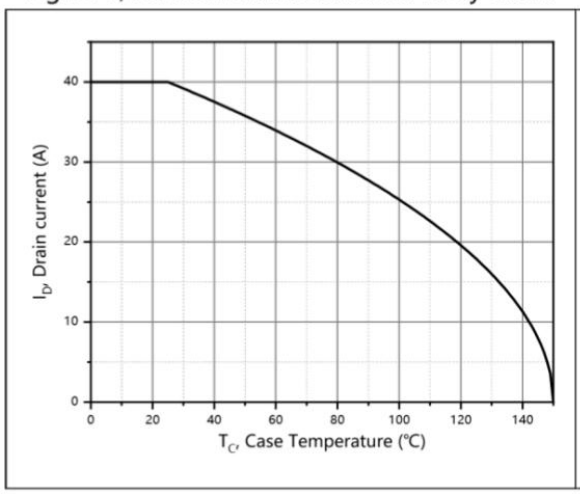


Figure 9, Drain current

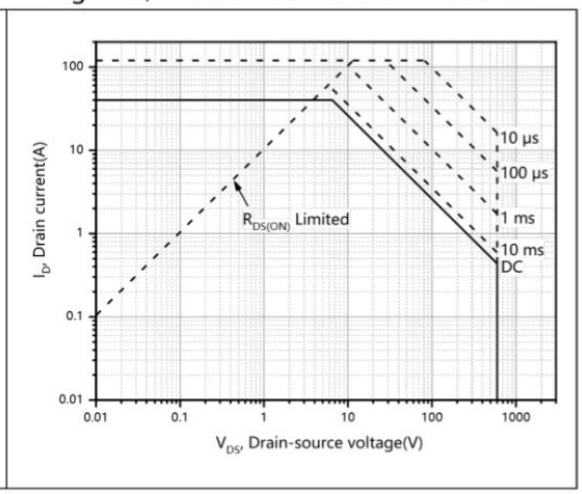


Figure 10, Safe operation area for TO247/TO263/TO220 T_C=25 ℃

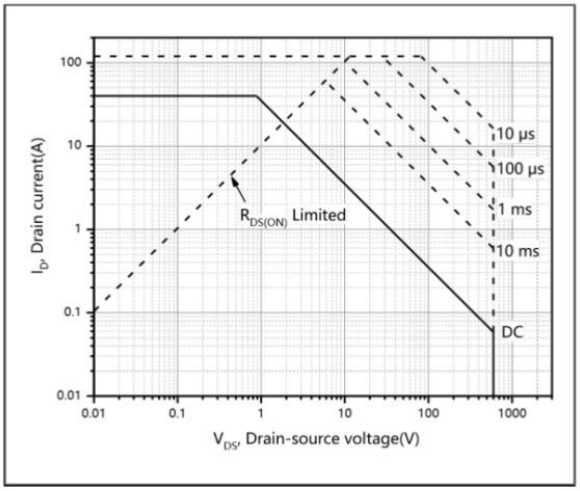


Figure 11, Safe operation area for TO220F

T_C=25 ℃

Test circuits and waveforms

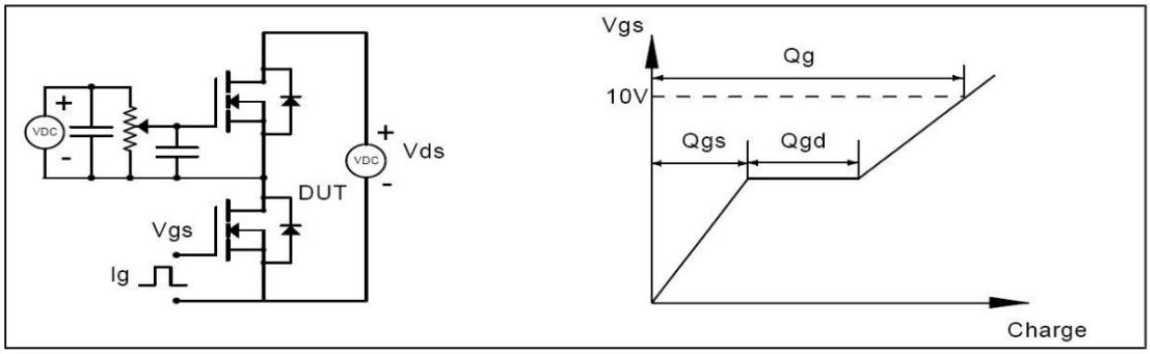


Figure 1, Gate charge test circuit & waveform

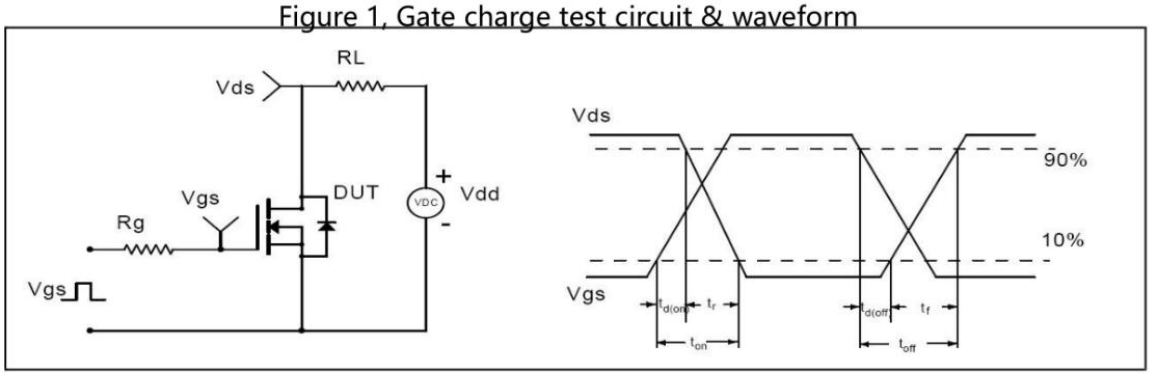


Figure 2, Switching time test circuit & waveforms

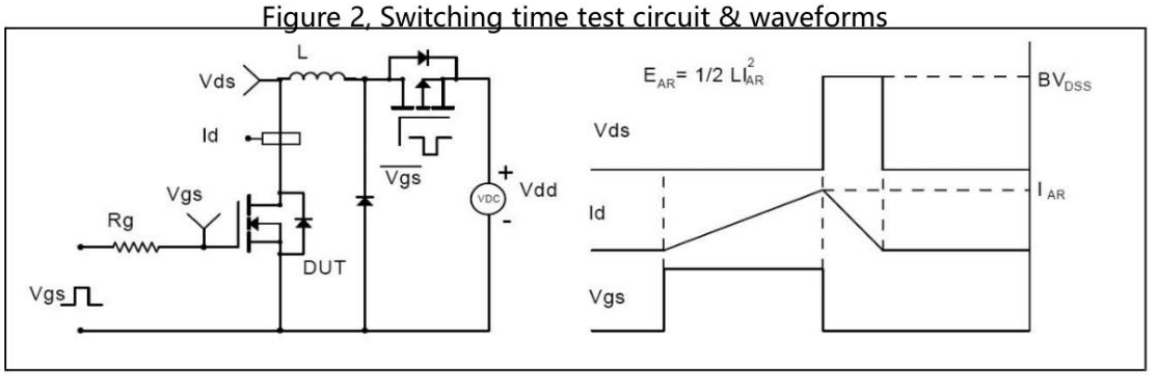


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

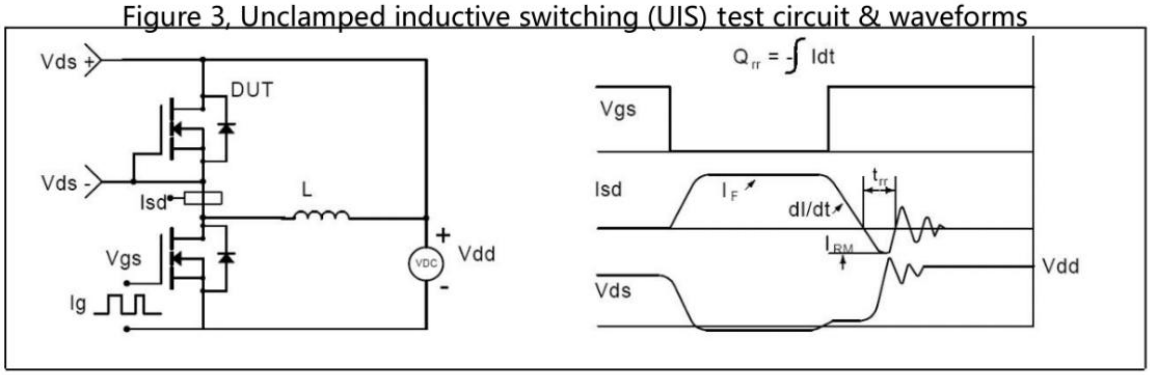
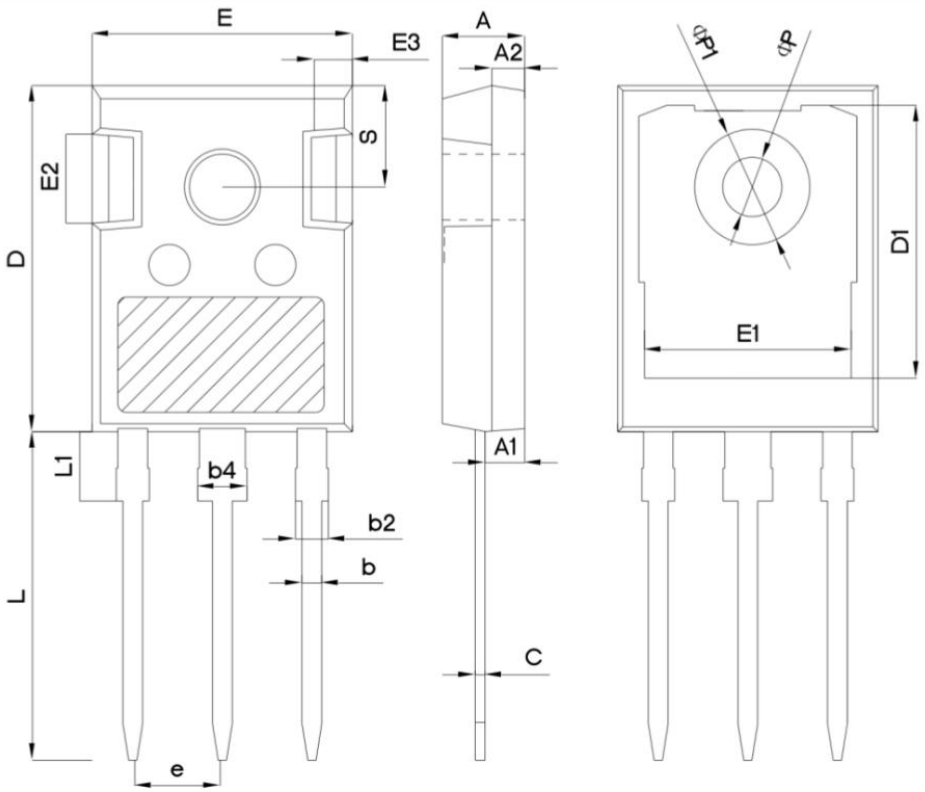


Figure 4, Diode reverse recovery test circuit & waveforms



SYMBOL	mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.80	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.82	19.92	20.22
L1	-	-	4.30
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S	6.15BSC		

Disclaimer

EVVOSEMI ("EVVO") reserves the right to make corrections, enhancements, improvements, and other changes to its products and services at any time, and to discontinue any product or service without notice.

EVVO warrants the performance of its hardware products to the specifications applicable at the time of sale in accordance with its standard warranty. Testing and other quality control techniques are used as deemed necessary by EVVO to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

Customers should obtain and confirm the latest product information and specifications before final design, purchase, or use. EVVO makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does EVVO assume any liability for application assistance or customer product design. EVVO does not warrant or accept any liability for products that are purchased or used for any unintended or unauthorized application.

EVVO products are not authorized for use as critical components in life support devices or systems without the express written approval of EVVOSEMI.

The EVVO logo and EVVOSEMI are trademarks of EVVOSEMI or its subsidiaries in relevant jurisdictions. EVVO reserves the right to make changes without further notice to any products herein.