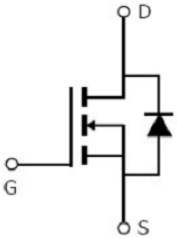
Main Product Characteristics:

V_{DSS}	200V
R_{DS}(on)	0.135ohm(typ.)
I_D	18A

D2PAK

Marking and Pin Assignment



Schematic Diagram

Features and Benefits:

- Advanced trench MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 175℃ operating temperature

Description:

It utilizes the latest trench processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications

Absolute max Rating:

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V①	18	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V①	11.45	
I_{DM}	Pulsed Drain Current②	72	
P_D @TC = 25°C	Power Dissipation③	110	W
	Linear Derating Factor	0.9	W/°C
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy @ L=10mH②	320	mJ
I_{AR}	Avalanche Current @ L=10mH②	8	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case③	—	1.1	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

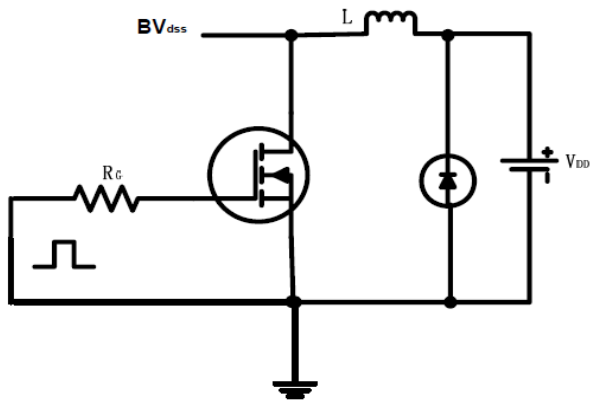
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	200	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	0.135	0.16	mΩ	V_{GS}=10V,I_D = 9A
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	V_{DS} = V_{GS}, I_D = 250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 200V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =30V
		—	—	-100		V_{GS} = -30V
Q_g	Total gate charge	—	24.5	—	nC	I_D = 18A, V_{DS}=160V, V_{GS} = 10V
Q_{gs}	Gate-to-Source charge	—	5.24	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	7.46	—		
$t_{d(on)}$	Turn-on delay time	—	9.0	—	ns	V_{GS}=10V, V_{DS}=100V, I_D = 18A, R_{GEN}=5Ω
t_r	Rise time	—	38.8	—		
$t_{d(off)}$	Turn-Off delay time	—	30.8	—		
t_f	Fall time	—	50.0	—		
C_{iss}	Input capacitance	—	1215	—	pF	V_{GS} = 0V V_{DS} = 25V f = 1MHz
C_{oss}	Output capacitance	—	162	—		
C_{rss}	Reverse transfer capacitance	—	28	—		

Source-Drain Ratings and Characteristics

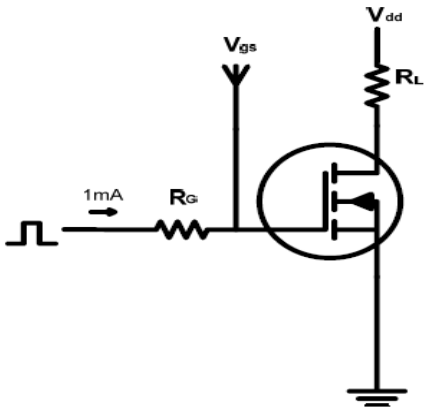
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	18	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	72	A	
V_{sd}	Diode Forward Voltage	—	0.92	1.4	V	I_S=30A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	134	—	ns	T_J = 25°C, I_F =18A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	680	—	nC	

Test circuits and Waveforms

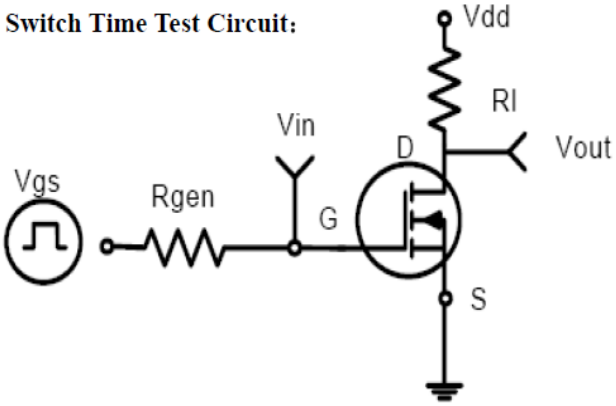
EAS test circuits:



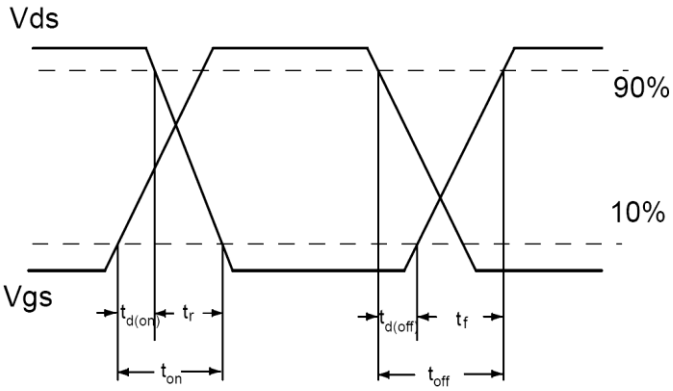
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

①The maximum current rating is limited by bond-wires.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

Typical electrical and thermal characteristics

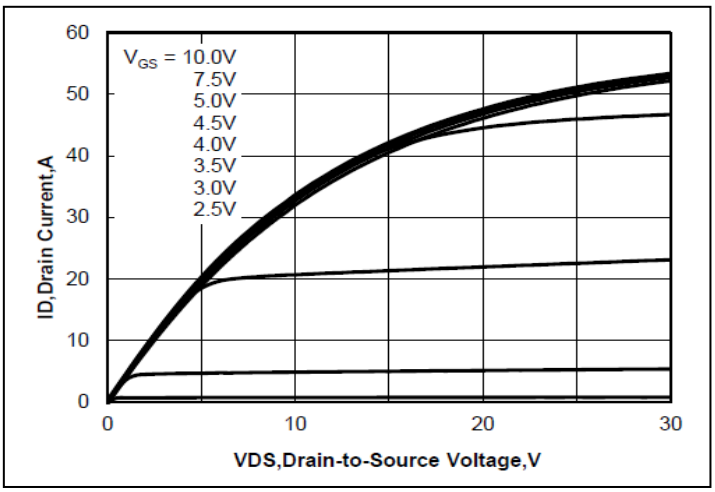


Figure 1.Typical Output Characteristics

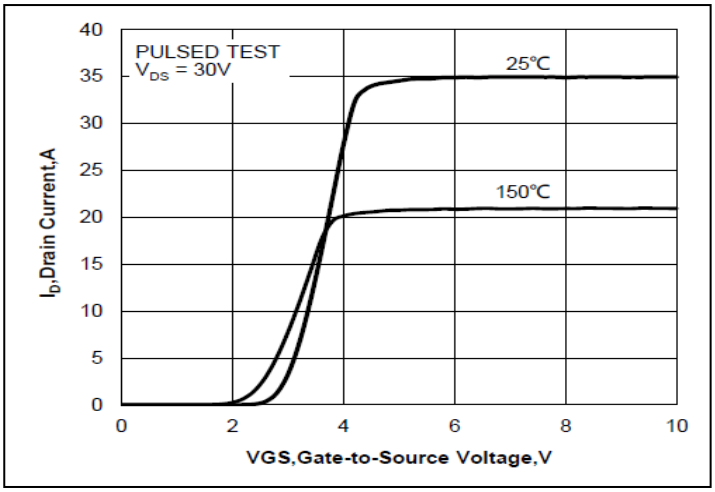


Figure 2.Transfer Characteristics

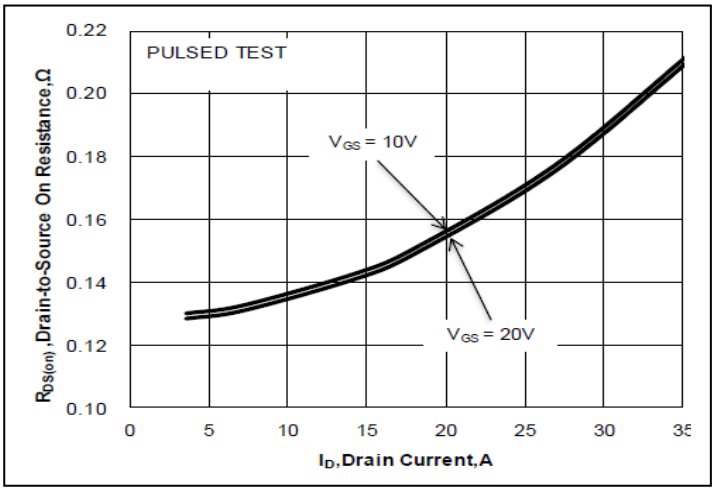


Figure 3.Drain-to-Source On Resistance Vs. Drain Current and Gate Voltage

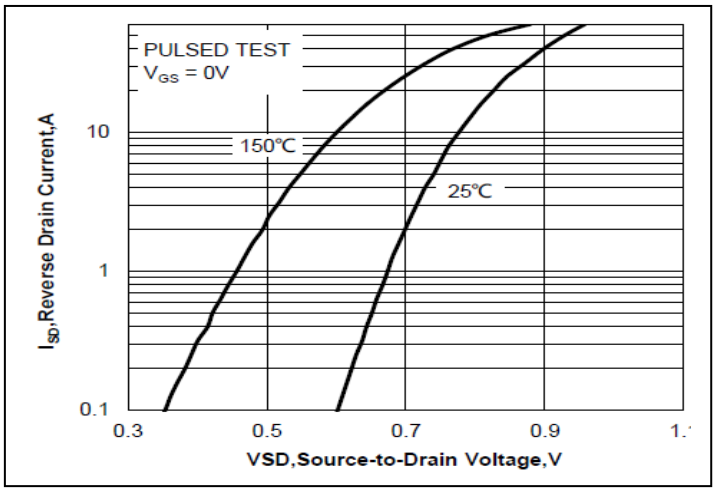


Figure 4. Body Diode Forward Voltage Vs. Source Current and Temperature

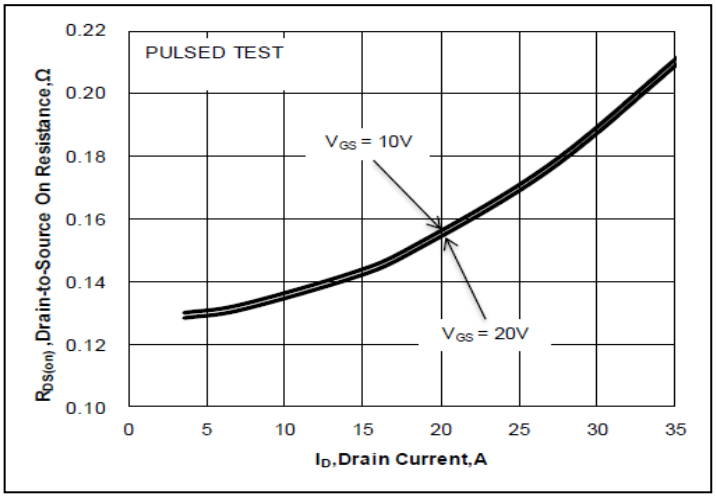


Figure 5.Capacitance Characteristics

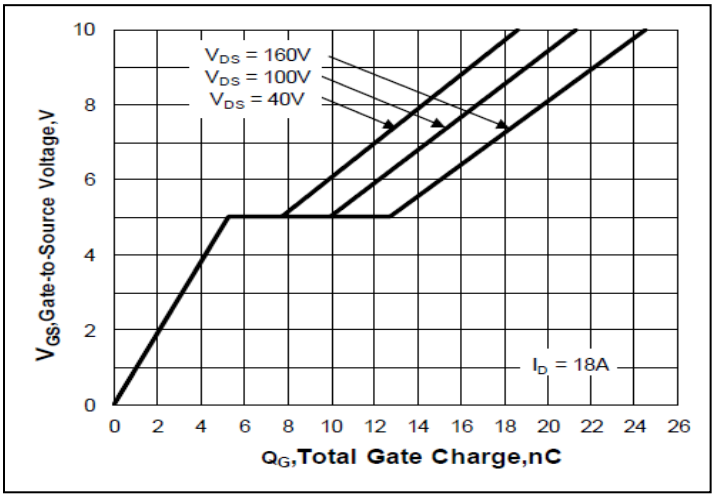


Figure 6.Gate Charge Characteristics

Typical electrical and thermal characteristics

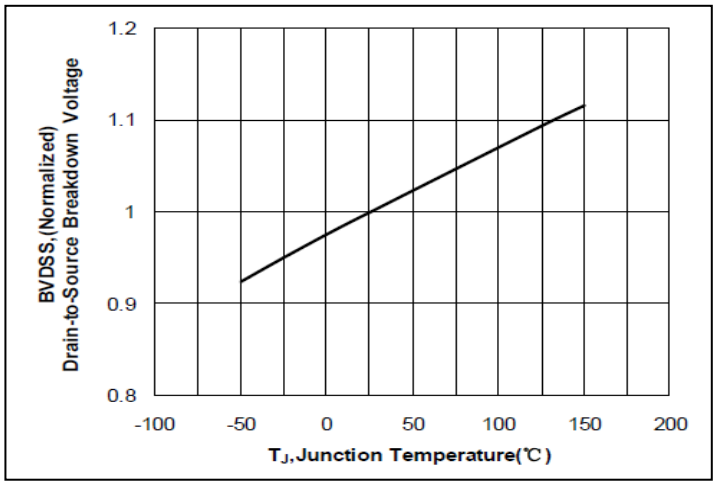


Figure 7.Normalized Breakdown Voltage Vs. Junction Temperature

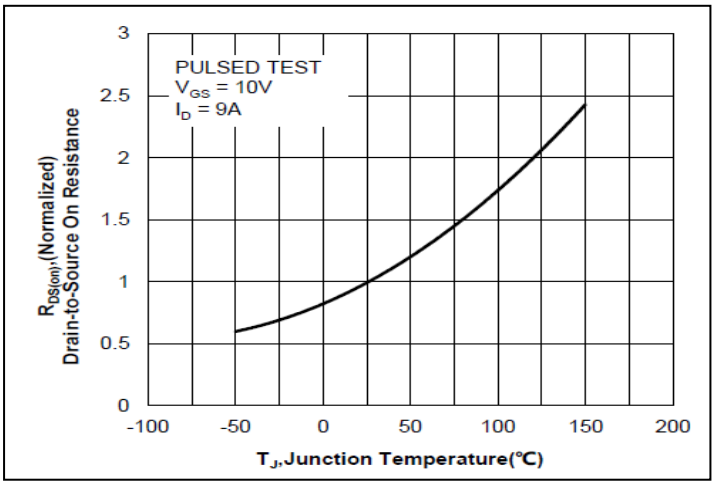


Figure 8. Normalized On Resistance Vs. Junction Temperature

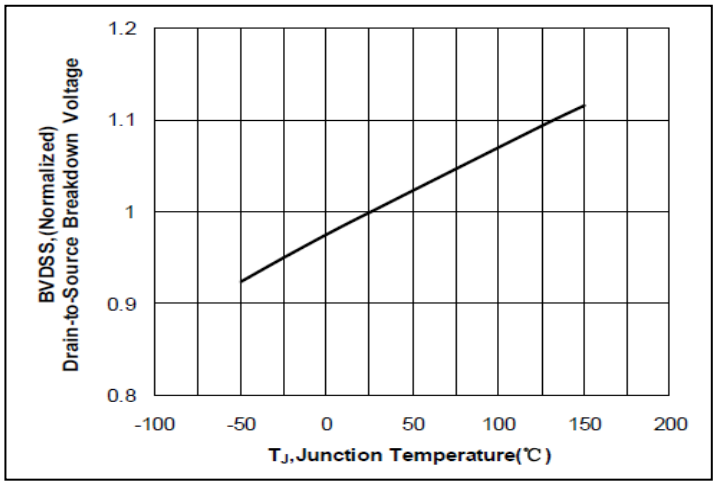


Figure 9. Maximum Safe Operating Area

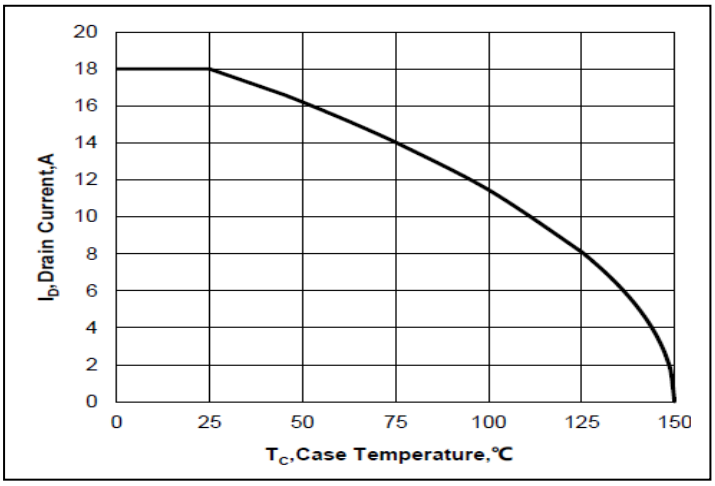


Figure 10. Maximum Continous Drain Current Vs. Case Temperature

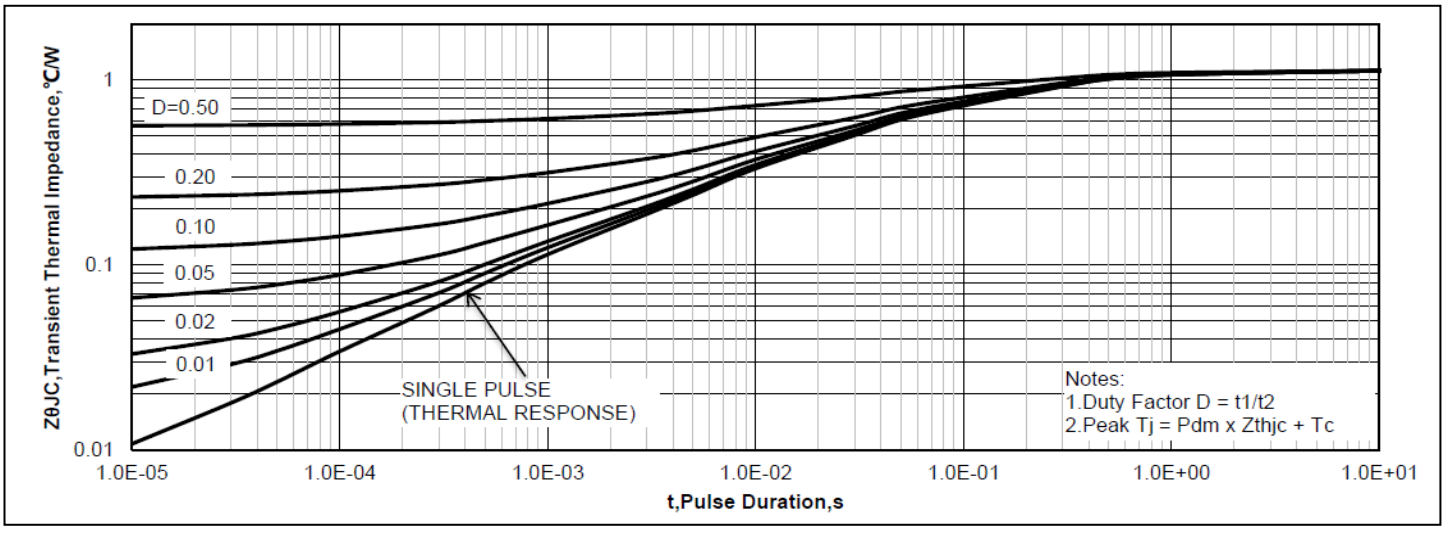
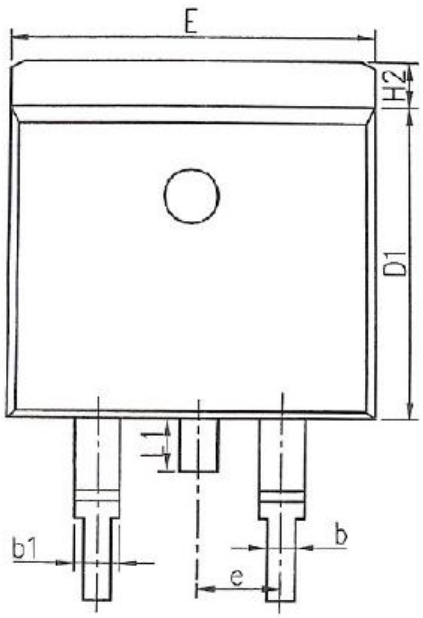
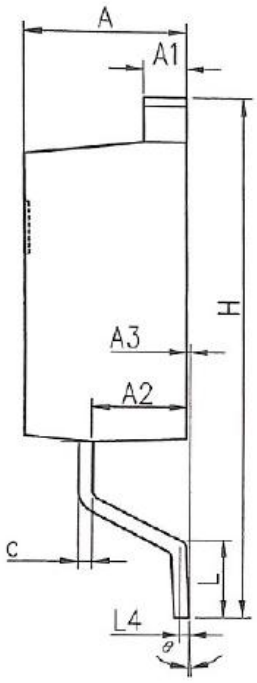
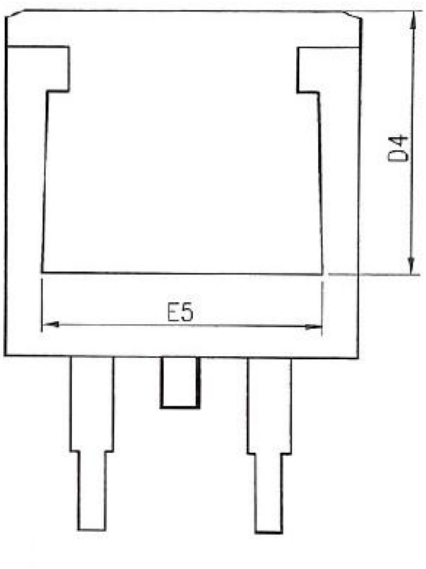


Figure7. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Mechanical Data：







COMMON DIMENSIONS			
SYMBOL	MM		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0.00	0.13	0.25
b	0.70	0.81	0.96
b1	1.17	1.27	1.47
c	0.30	0.38	0.53
D1	8.50	8.70	8.90
D4	6.60	-	-
E	9.86	10.16	10.36
E5	7.06	-	-
e		2.54BSC	
H	14.70	15.10	15.50
H2	1.07	1.27	1.47
L	2.00	2.30	2.60
L1	1.40	1.55	1.70
L4		0.25BSC	
θ	0°	5°	9°

Ordering and Marking Information

Device Marking: SSF18N20A

Package (Available)

D2PAK

Operating Temperature Range

C : -55 to 150 °C

Devices per Unit

Package Type	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
D2PAK	50	20	1000	6	6000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T_j=125℃ to 175℃ @ 80% of Max V_{DSS}/V_{CES}/VR	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T_j=150℃ or 175℃ @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices

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