

Main Product Characteristics:

V_{DSS}	150V
$R_{DS(on)}$	22mohm(typ.)
I_D	65A


TO220

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°C 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	65	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V①	45	
I_{DM}	Pulsed Drain Current②	260	
P_D @TC = 25°C	Power Dissipation③	272	W
	Linear Derating Factor	2	W/°C
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.72mH②	1.3	mJ
I_{AS}	Avalanche Current @ L=0.72mH②	1.9	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 175	°C

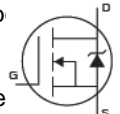
Thermal Resistance

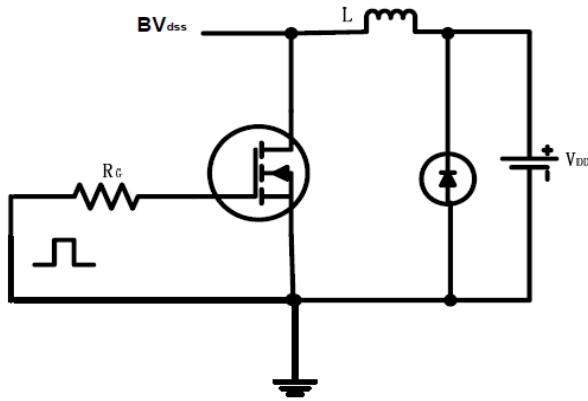
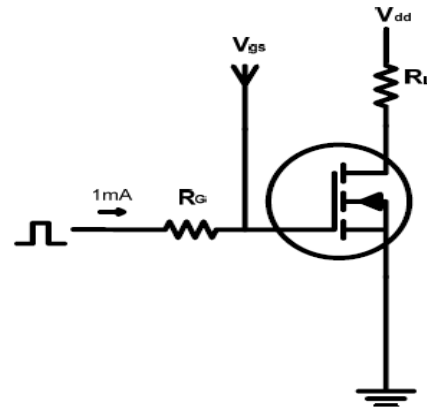
Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ^③	—	0.55	°C/W
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ^④	—	62	°C/W
	Junction-to-Ambient (PCB mounted, steady-state) ^④	—	40	°C/W

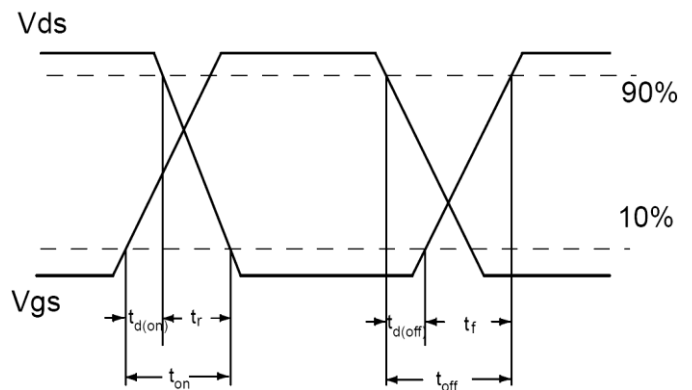
Electrical Characterizes @ $T_A=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	150	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	22	26	mΩ	$V_{GS}=10V, I_D = 36A$ $T_J = 125^\circ\text{C}$
		—	51.4	—		
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$ $T_J = 125^\circ\text{C}$
		—	2.2	—		
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 150V, V_{GS} = 0V$ $T_J = 125^\circ\text{C}$
		—	—	50		
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 30V$ $V_{GS} = -30V$
		-100	—	—		
Q_g	Total gate charge	—	227.3	—	nC	$I_D = 36A,$ $V_{DS}=120V,$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source charge	—	43.0	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	78.8	—		
$t_{d(on)}$	Turn-on delay time	—	27.0	—	ns	$V_{GS}=10V, V_{DS}=75V,$ $R_L=2.1\Omega,$ $R_{GEN}=2.5\Omega,$ $I_D = 36A$
t_r	Rise time	—	65.8	—		
$t_{d(off)}$	Turn-Off delay time	—	118.7	—		
t_f	Fall time	—	78.1	—		
C_{iss}	Input capacitance	—	11529	—	pF	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 800\text{KHz}$
C_{oss}	Output capacitance	—	334	—		
C_{rss}	Reverse transfer capacitance	—	321	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	65	A	MOSFET symb showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	260	A	
V_{SD}	Diode Forward Voltage	—	0.84	1.3	V	$I_S=36A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	87.6	—	ns	$T_J = 25^\circ\text{C}, I_F = 26A, di/dt =$
Q_{rr}	Reverse Recovery Charge	—	401.5	—	nC	100A/μs

Test circuits and Waveforms
EAS test circuits:

Gate charge test circuit:

Switch Time Test Circuit:

Switch Waveforms:

Notes:

- ① The maximum current rating is limited by bond-wires.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The 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 $T_A = 25^\circ\text{C}$
- ⑤ These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)} = 175^\circ\text{C}$.
- ⑥ The maximum current rating is limited by bond-wires.

Typical electrical and thermal characteristics

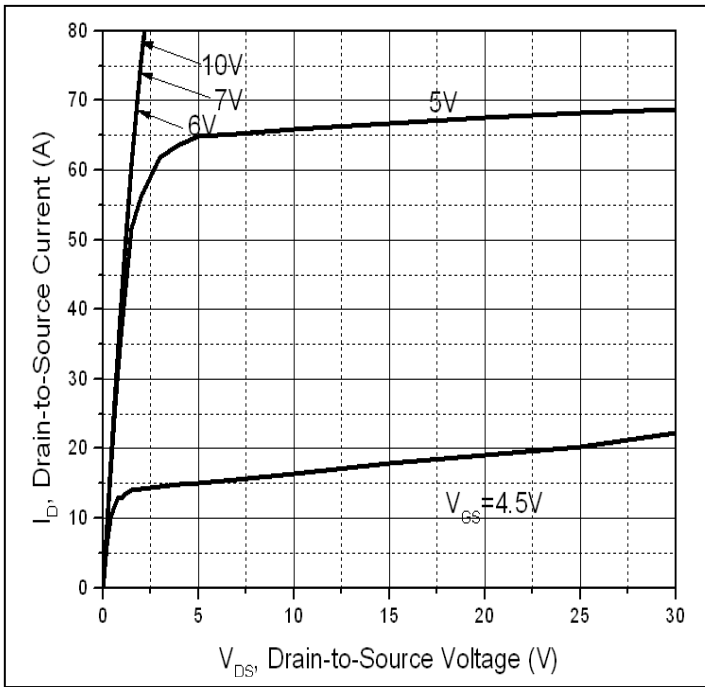


Figure 1: Typical Output Characteristics

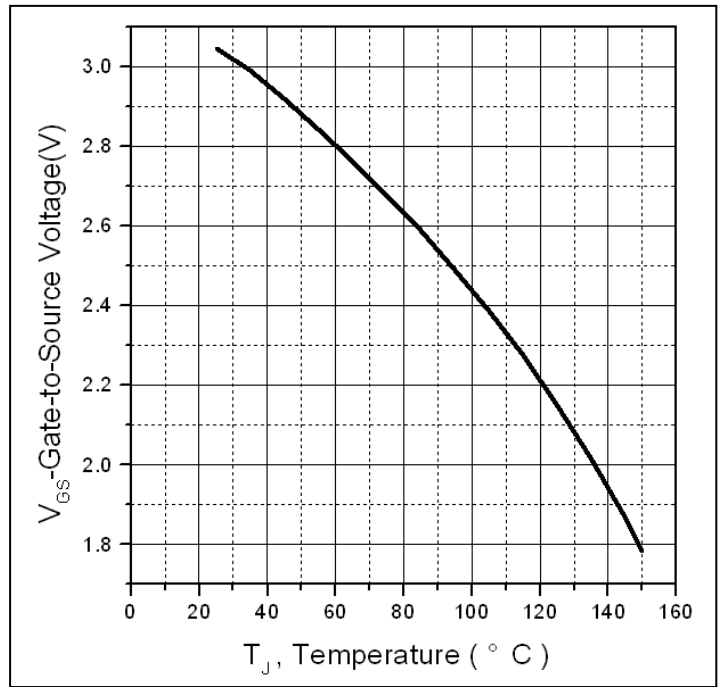


Figure 2. Gate to source cut-off voltage

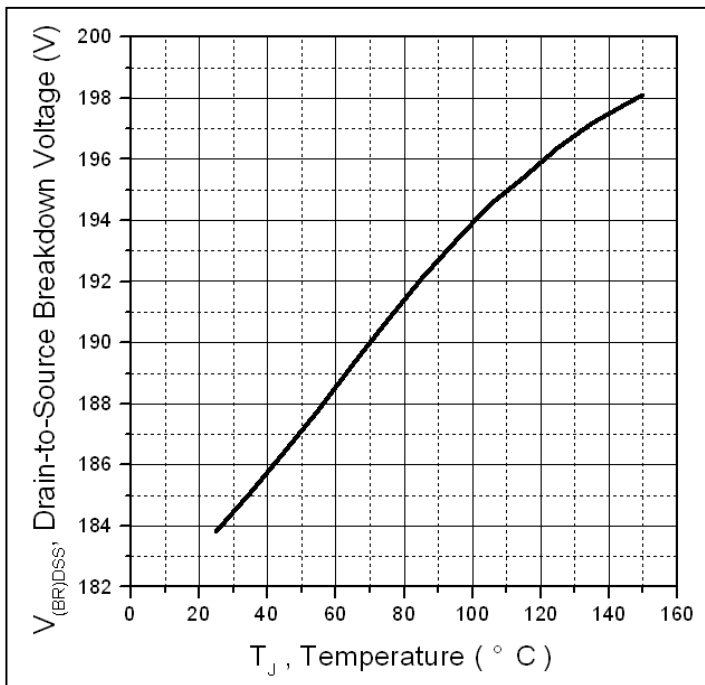


Figure 3. Drain-to-Source Breakdown Voltage vs. Temperature

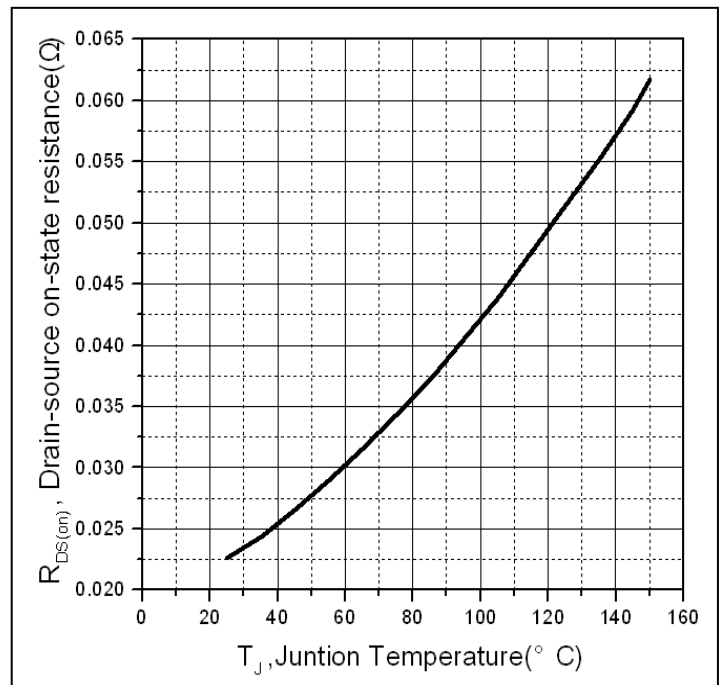


Figure 4: Normalized On-Resistance Vs. Case Temperature

Typical electrical and thermal characteristics

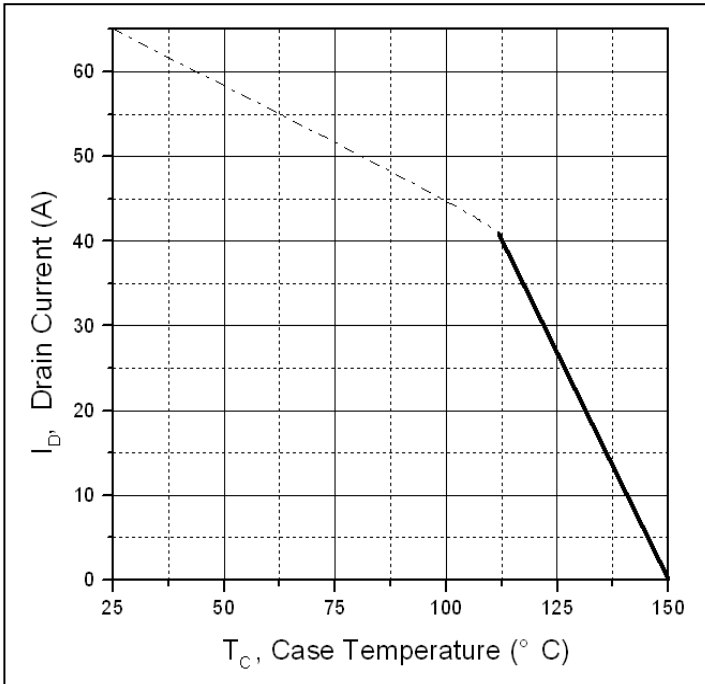


Figure 5. Maximum Drain Current Vs. Case Temperature

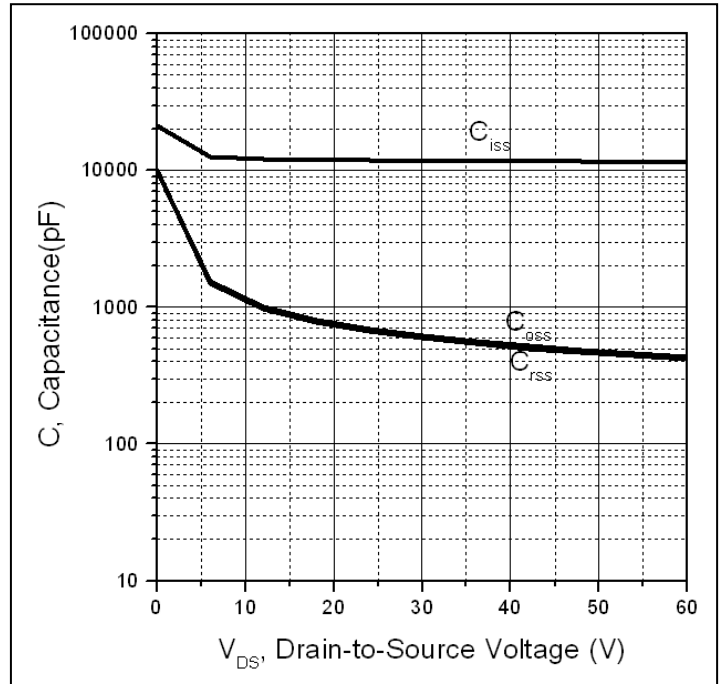


Figure 6. Typical Capacitance Vs. Drain-to-Source Voltage

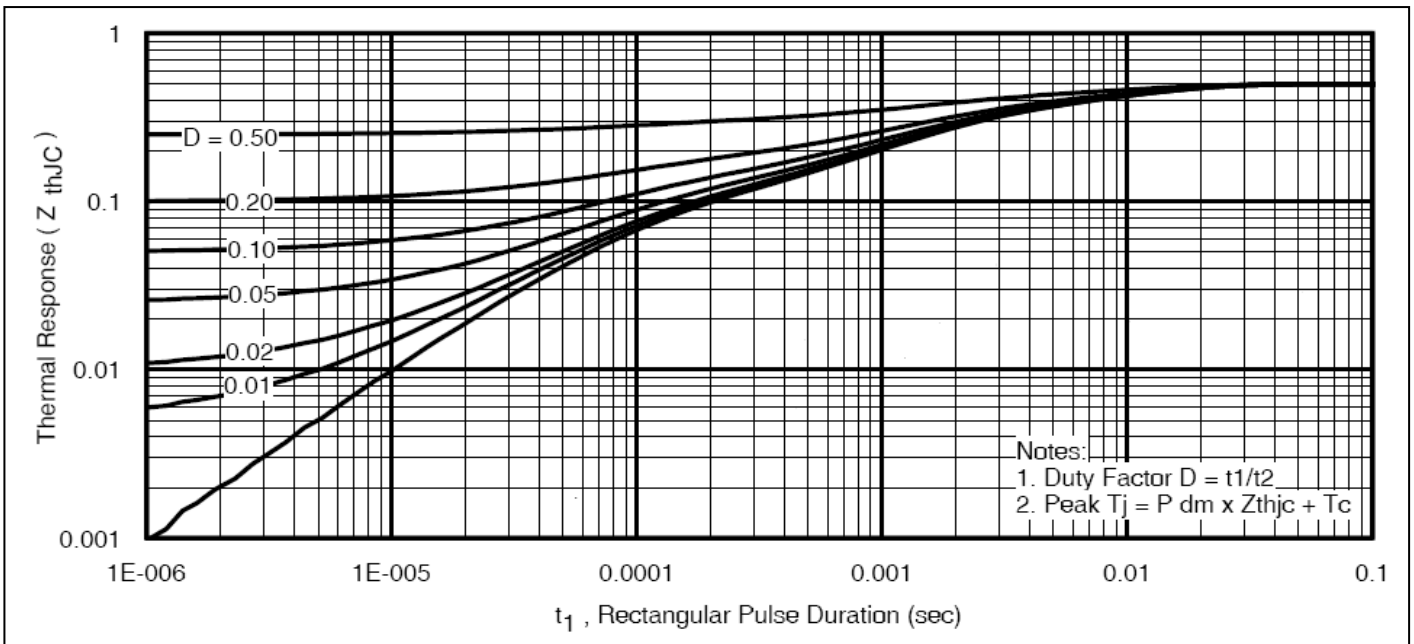
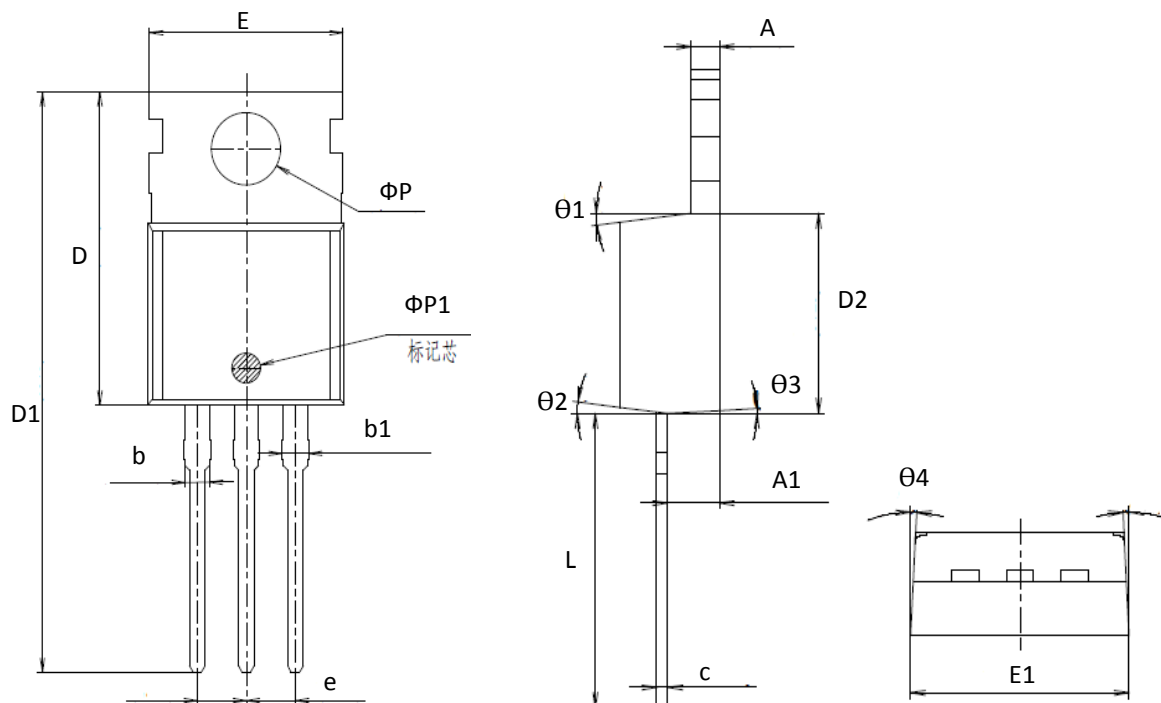


Figure 7. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Mechanical Data:
TO220 PACKAGE OUTLINE DIMENSION_GN


Symbol	Dimension In Millimeters			Dimension In Inches		
	Min	Nom	Max	Min	Nom	Max
A	-	1.300	-	-	0.051	-
A1	2.200	2.400	2.600	0.087	0.094	0.102
b	-	1.270	-	-	0.050	-
b1	1.270	1.370	1.470	0.050	0.054	0.058
c	-	0.500	-	-	0.020	-
D	-	15.600	-	-	0.614	-
D1	-	28.700	-	-	1.130	-
D2	-	9.150	-	-	0.360	-
E	9.900	10.000	10.100	0.390	0.394	0.398
E1	-	10.160	-	-	0.400	-
ΦP	-	3.600	-	-	0.142	-
ΦP1		1.500			0.059	
e	2.54BSC			0.1BSC		
L	12.900	13.100	13.300	0.508	0.516	0.524
θ1	-	7°	-	-	7°	-
θ2	-	7°	-	-	7°	-
θ3	-	3°	-	5°	7°	9°
θ4	-	3°	-	1°	3°	5°

Ordering and Marking Information
Device Marking: SSF1526

Package (Available)
TO220
Operating Temperature Range
C : -55 to 175 °C

Devices per Unit

Package Type	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO220	50	20	1000	6	6000

Reliability Test Program

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

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