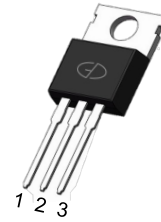


## 95mΩ,600V (D-S) Super Junction Power MOSFET

### Features

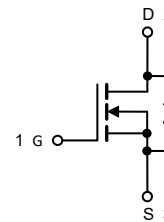
- 100% Avalanche Tested
- Extremely Low Losses with Low FOM  $R_{ds(on)} \cdot Q_g$
- Halogen Free, Pb-Free
- RoHS Compliant



TO-220AB

### Applications

- Solar inverter
- Telecom/Sever
- AC/DC power supply



### Absolute Maximum Ratings ( $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain Source Voltage	$V_{DS}$	600	V
Gate Source Voltage	$V_{GS}$	$\pm 30$	V
Drain Current, Continuous $V_{GS}=10\text{V}$	$I_D$	$T_C=25^\circ\text{C}$	35
		$T_C=100^\circ\text{C}$	22
Drain Current, Pulsed (Note 1)	$I_{DM}$	105	A
Single Avalanche Energy (Note 2)	$E_{AS}$	750	mJ
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	278
		$T_C=100^\circ\text{C}$	110
Operating Junction/ Storage Temperature Range	$T_J/ T_{STG}$	-55 to +150	$^\circ\text{C}$

Note 1: Single pulse;  $t_p \leq 1\mu\text{s}$ .

Note 2:  $V_{DD} = 50\text{V}$ ,  $I_D = 12.5\text{A}$ ,  $R_G = 25\Omega$ , starting  $T_J = 25^\circ\text{C}$ .

### Thermal Characteristics

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{thJC}$	0.45	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	$R_{thJA}$	62	$^\circ\text{C/W}$

Note 3: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a  $25^\circ\text{C}$  still air environment.

<b>Electrical Characteristics</b> ( $T_J = 25^\circ\text{C}$ unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=1mA$	600	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V$	--	--	10	$\mu A$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_{DS}=1mA$	3.5	--	4.5	V
Gate Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	--	--	$\pm 100$	nA
Drain-Source On-state Resistance (Note 4)	$R_{DS(on)}$	$V_{GS}=10V, I_D=18A$	--	82	95	m $\Omega$
Total Gate Charge	$Q_g$	$V_{GS}=0$ to 10V, $V_{DD}=400V, I_D=18A$	--	66	--	nC
Gate-Source Charge	$Q_{gs}$		--	20	--	
Gate-Drain Charge	$Q_{gd}$		--	25	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=400V, I_D=18A$	--	82	--	ns
Turn-on Rise Time	$t_r$		--	22	--	
Turn-off Delay Time	$t_{d(off)}$		--	76	--	
Turn-off Fall Time	$t_f$		--	8	--	
Gate Resistance	$R_g$	$V_{GS}=0V, f=1MHz$	--	2.7	--	$\Omega$
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=50V, f=1MHz$	--	2990	--	pF
Output Capacitance	$C_{oss}$		--	141	--	
Reverse Transfer Capacitance	$C_{rss}$		--	5.8	--	

<b>Reverse Diode Characteristics</b> ( $T_J = 25^\circ\text{C}$ unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Current, Continuous	$I_{SD}$	$T_C=25^\circ\text{C}$	--	--	35	A
Diode Forward Voltage (Note 4)	$V_{SD}$	$I_F=18A, V_{GS}=0V$	--	0.88	--	V
Reverse Recovery Time	$T_{rr}$	$V_R=400V, I_F=18A, di/dt=100 A/\mu s$	--	140	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	1150	--	nC

Note 4: Pulse test; pulse width  $\leq 380\mu s$ , duty cycle  $\leq 1\%$ .

## Typical Characteristics Curves ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 - Output Characteristics

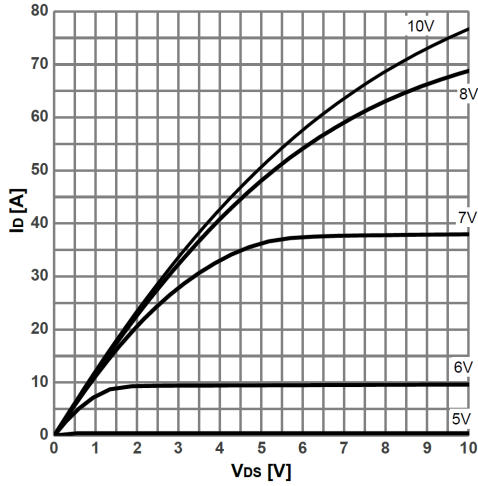


Fig.2 - Transfer Characteristics

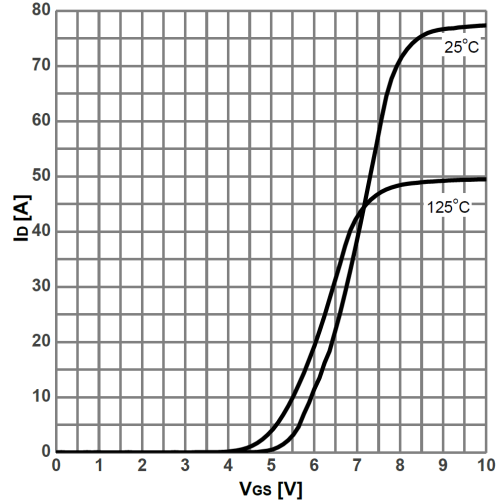


Fig.3 - Drain-Source On-Resistance

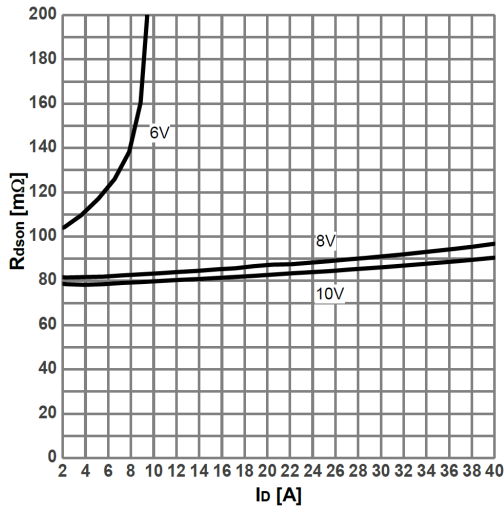


Fig.4 - Normalized On-Resistance

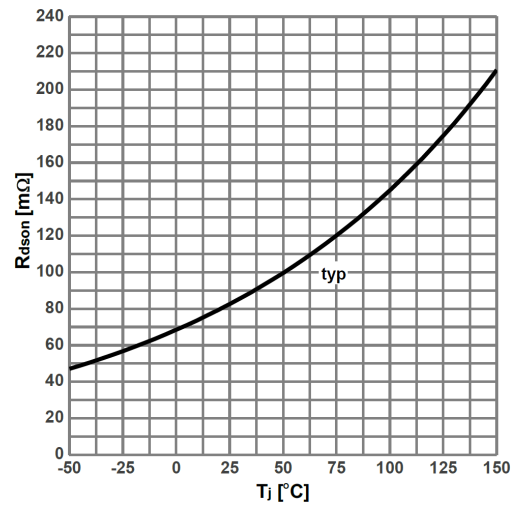


Fig.5 - Capacitance

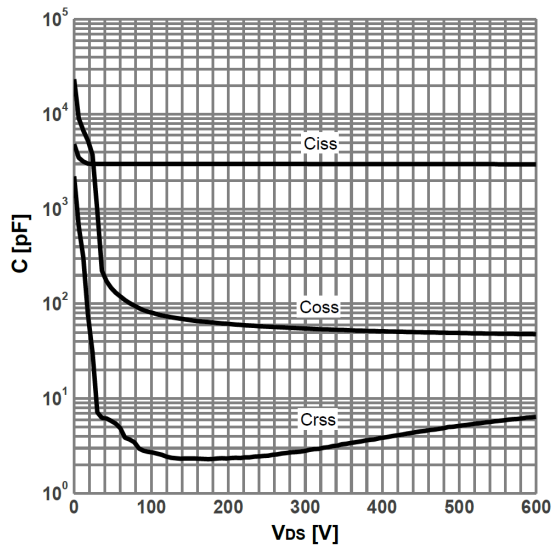
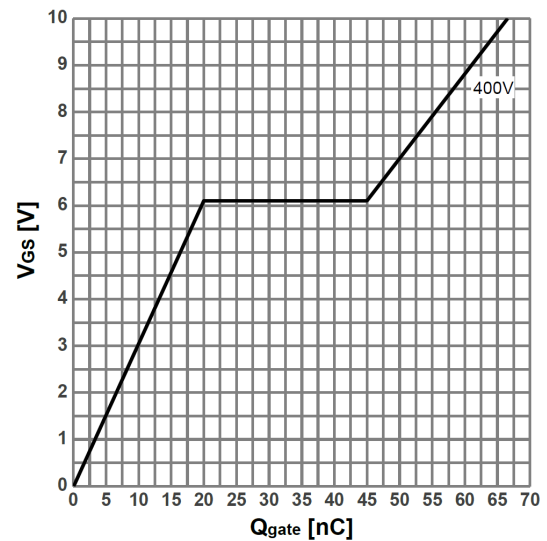


Fig.6 - Gate charge



## Typical Characteristics Curves ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Fig.7 - Forward Characteristic

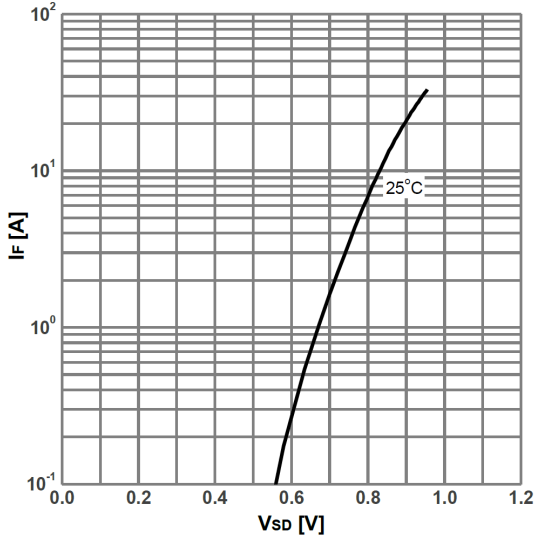


Fig.8 - Safe Operating Area

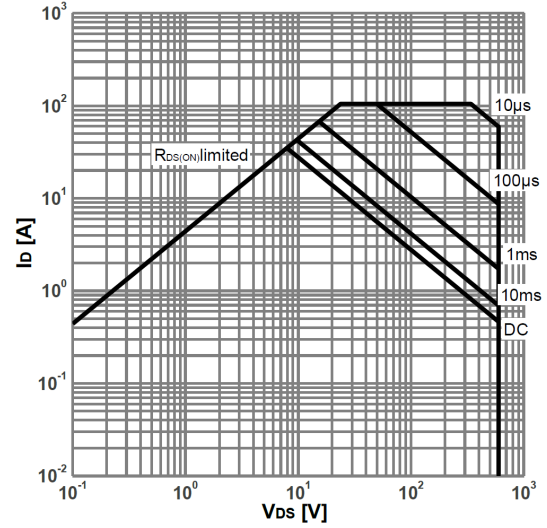


Fig.9 - Normalized Thermal Impedance, Junction-Case

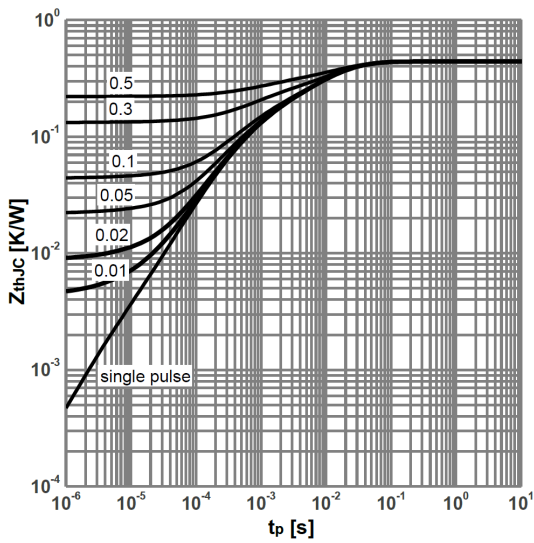


Fig.10 - Power Derating

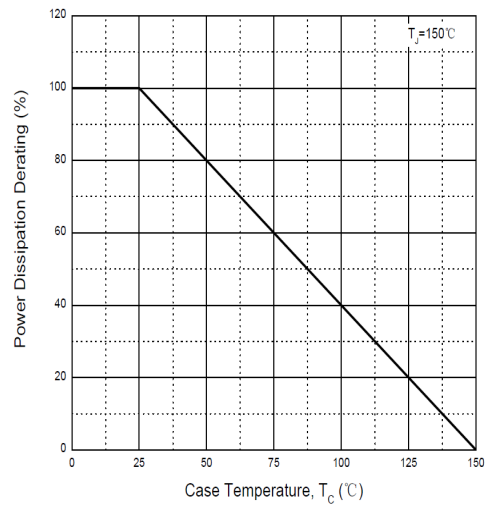
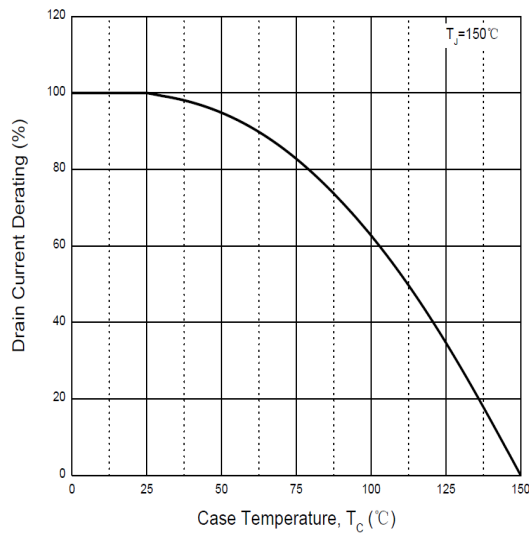
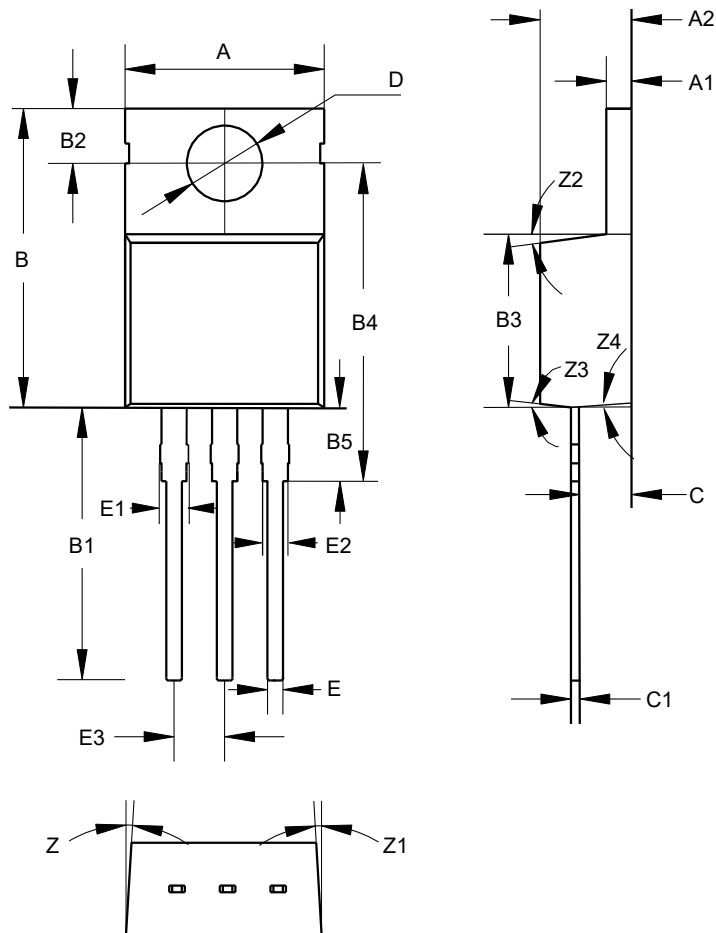


Fig.11 - Drain Current Derating



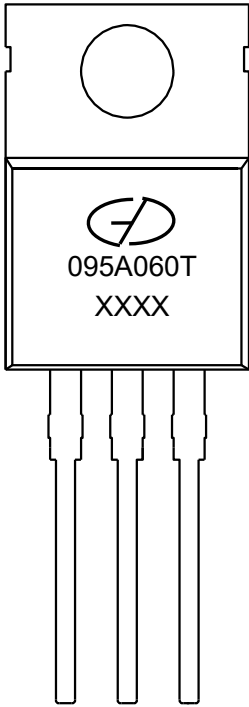
**Package Outline Dimensions** (Unit: millimeters)

**TO-220AB**




TO-220AB							
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	9.8	10	10.2	D	3.7	3.8	3.9
A1	1.17	1.27	1.37	E	0.68	0.78	0.88
A2	4.5	4.6	4.7	E1	1.2	1.4	1.6
B	14.5	15	15.5	E2	1.17	1.27	1.37
B1	13.2	13.7	14.2	E3	2.44	2.54	2.64
B2	2.65	2.75	2.85	Z	-	3°	-
B3	8.5	8.7	8.9	Z1	-	3°	-
B4	15.5	16	16.5	Z2	-	7°	-
B5	3.4	3.7	4.0	Z3	-	7°	-
C	2.3	2.6	2.9	Z4	-	1.5°	-
C1	0.28	0.38	0.48	-	-	-	-

**Marking Outline**



Part Name: GMN095A060T

1. Logo Mark: 
2. P/N Mark: 095A060T
3. Date Code: XXXX

**Revision History**

Version	Date	Major Changes
Rev.A	2024.05.29	Official Release

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