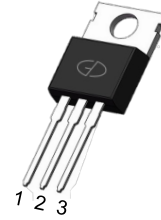


N-Channel 100V (D-S) Power MOSFET

Features

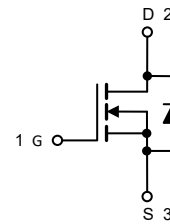
- 100% Avalanche Tested
- Extremely Low Losses with Low FOM $R_{ds(on)} \cdot Q_g$
- Halogen Free, Pb-Free
- RoHS Compliant



TO-220AB

Applications

- DC/DC
- Motors, lamps
- Power switching



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

Parameter	Symbol	Value	Unit
Drain Source Voltage	V_{DS}	100	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current, Continuous $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$	131
		$T_C=100^\circ\text{C}$	83
Drain Current, Pulsed (Note 1)	I_{DM}	524	A
Single Avalanche Energy (Note 2)	E_{AS}	625	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	167
		$T_C=100^\circ\text{C}$	67
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: $V_{DD} = 50\text{V}$, $V_{GS} = 10\text{V}$, $L = 0.5\text{mH}$, $R_G = 25\Omega$, starting $T_J = 25^\circ\text{C}$.

Thermal Characteristics

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	R_{thJC}	0.75	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	R_{thJA}	62.5	$^\circ\text{C/W}$

Note 3: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a 25°C still air environment.

Electrical Characteristics (T_J =25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	100	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	--	--	1	uA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	2	--	4	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
Drain-Source On-state Resistance (Note 4)	R _{DS(on)}	V _{GS} =10V, I _D =20A	--	3.8	4.2	mΩ
Total Gate Charge	Q _g	V _{GS(off)} =0V, V _{GS(on)} =10V, V _{DD} =50V, I _D =20A	--	56.6	--	nC
Gate-Source Charge	Q _{gs}		--	14.7	--	
Gate-Drain Charge	Q _{gd}		--	8	--	
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =50V, I _D =20A, R _G =10Ω	--	24	--	ns
Turn-on Rise Time	t _r		--	12	--	
Turn-off Delay Time	t _{d(off)}		--	15	--	
Turn-off Fall Time	t _f		--	50	--	
Gate Resistance	R _g	V _{GS} =0V, f=1MHz, open drain	--	2	--	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=250kHz	--	4240	--	pF
Output Capacitance	C _{oss}		--	1720	--	
Reverse Transfer Capacitance	C _{rss}		--	29.5	--	

Reverse Diode Characteristics (T_J =25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Current, Continuous	I _{SD}	T _C =25°C	--	--	150	A
Diode Forward Voltage (Note 4)	V _{SD}	I _F =20A, V _{GS} =0V	--	--	1.2	V
Reverse Recovery Time	T _{rr}	V _R =50V, I _F =20A, di/dt=100A/μs	--	60	--	ns
Reverse Recovery Charge	Q _{rr}		--	82	--	nC

Note 4: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

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

Fig.1 - Output Characteristics

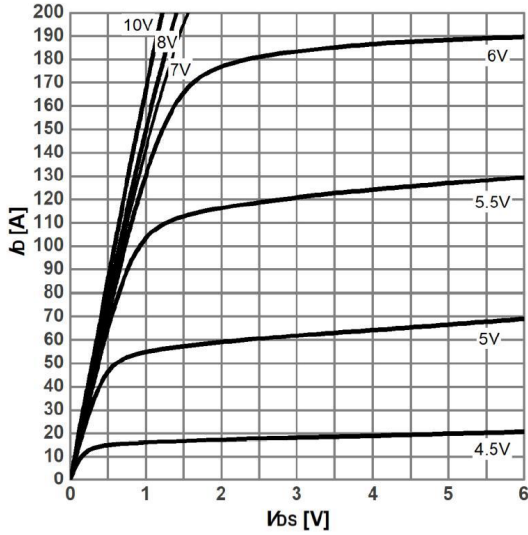


Fig.2 - Transfer Characteristics

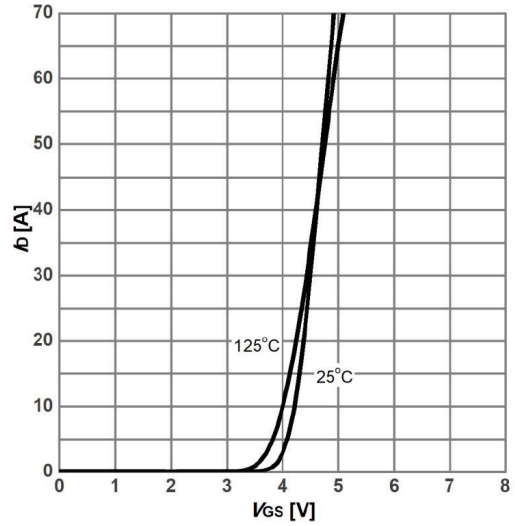


Fig.3 - Drain-Source On-Resistance

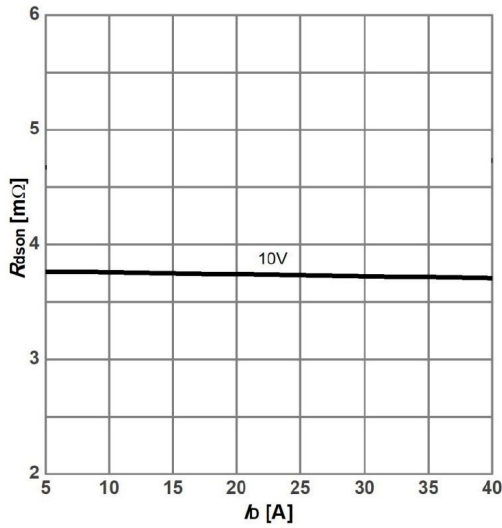


Fig.4 - Drain-Source On-Resistance

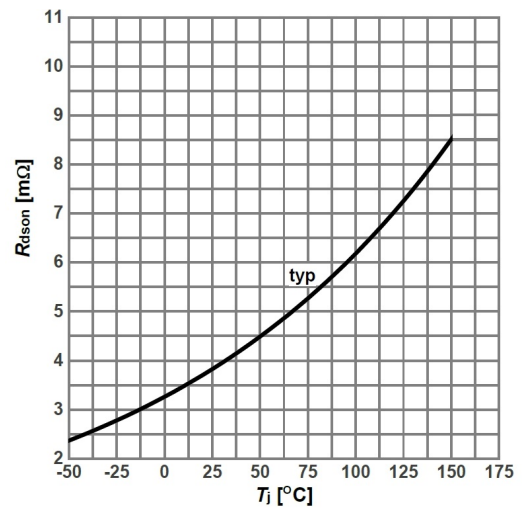


Fig.5 - Drain-Source On-Resistance

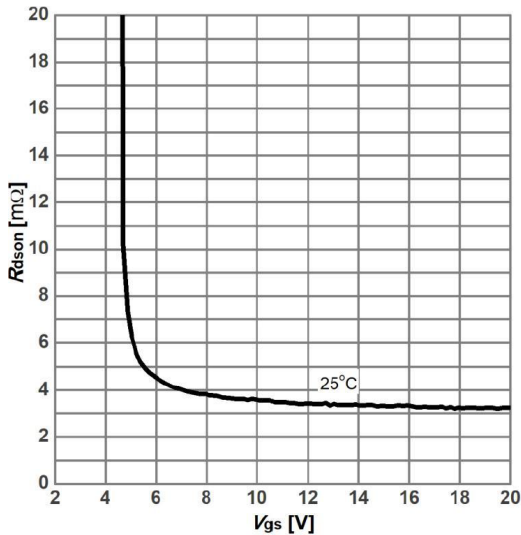
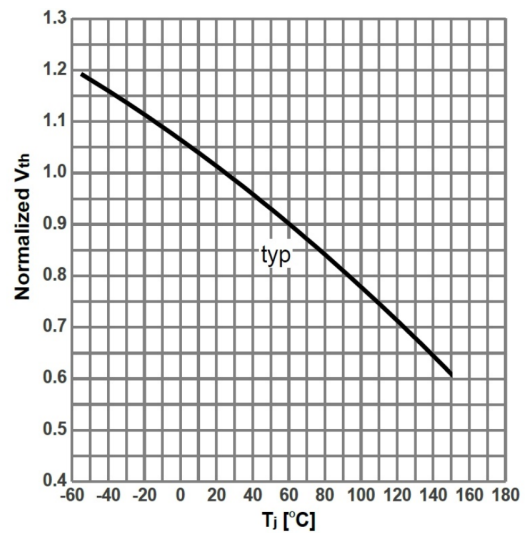


Fig.6 - Normalized Threshold Voltage



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

Fig.7 - Capacitance

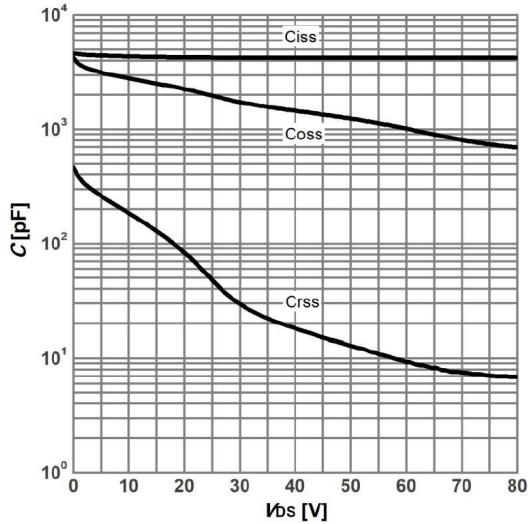


Fig.8 - Gate charge

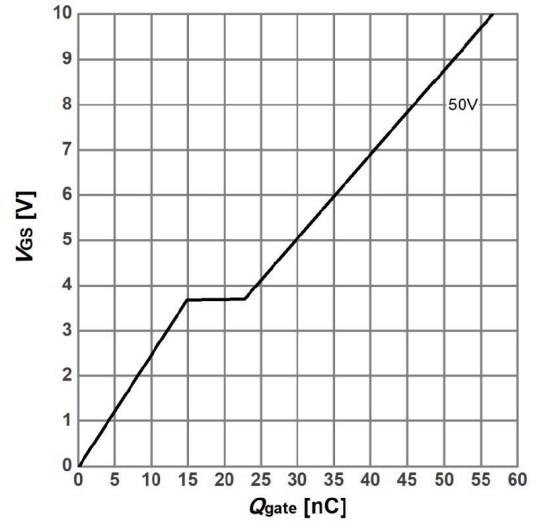


Fig.9 - Forward Characteristic

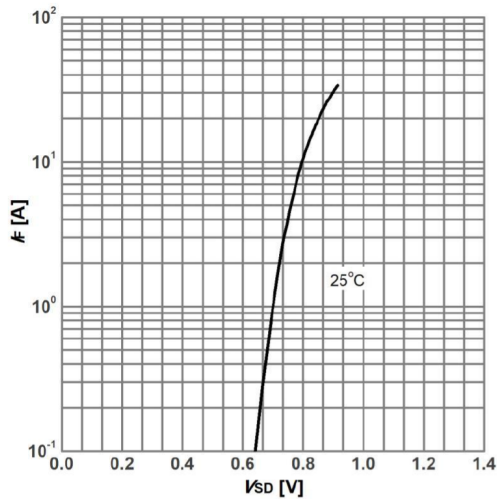


Fig.10 - Safe Operating Area

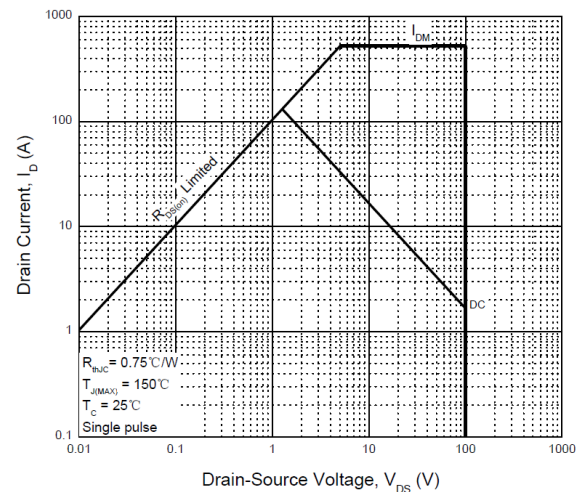


Fig.11 - Thermal Impedance, Junction-Case

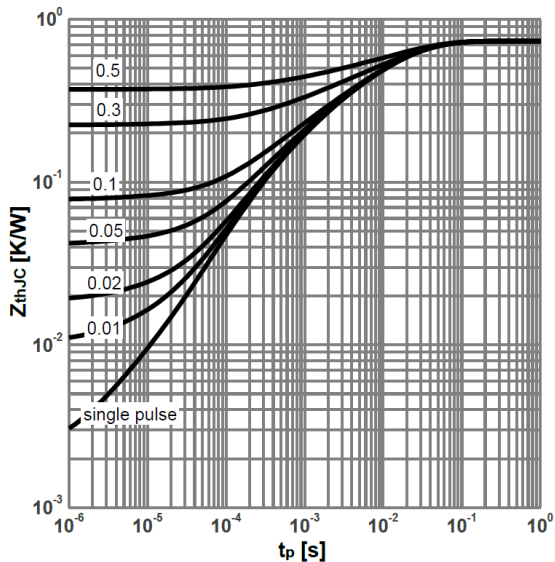
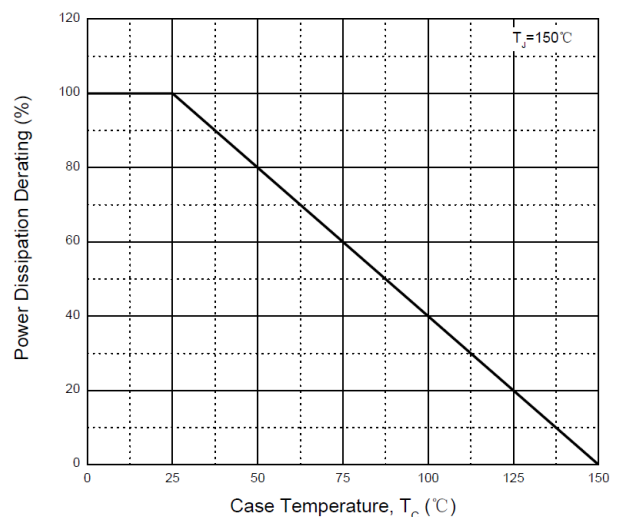
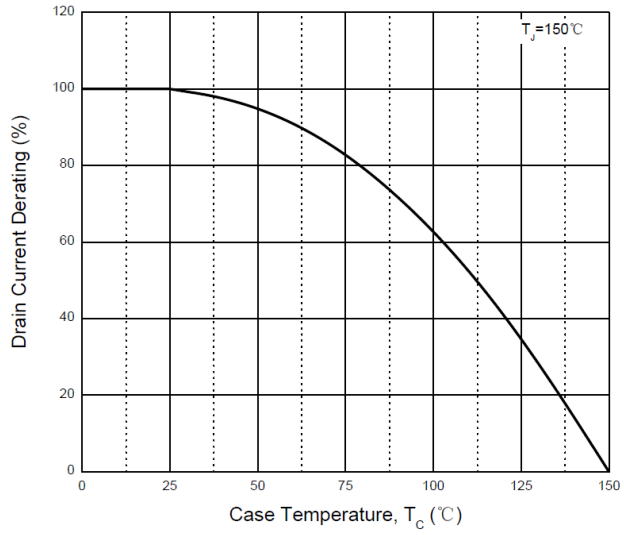


Fig.12 - Power Derating



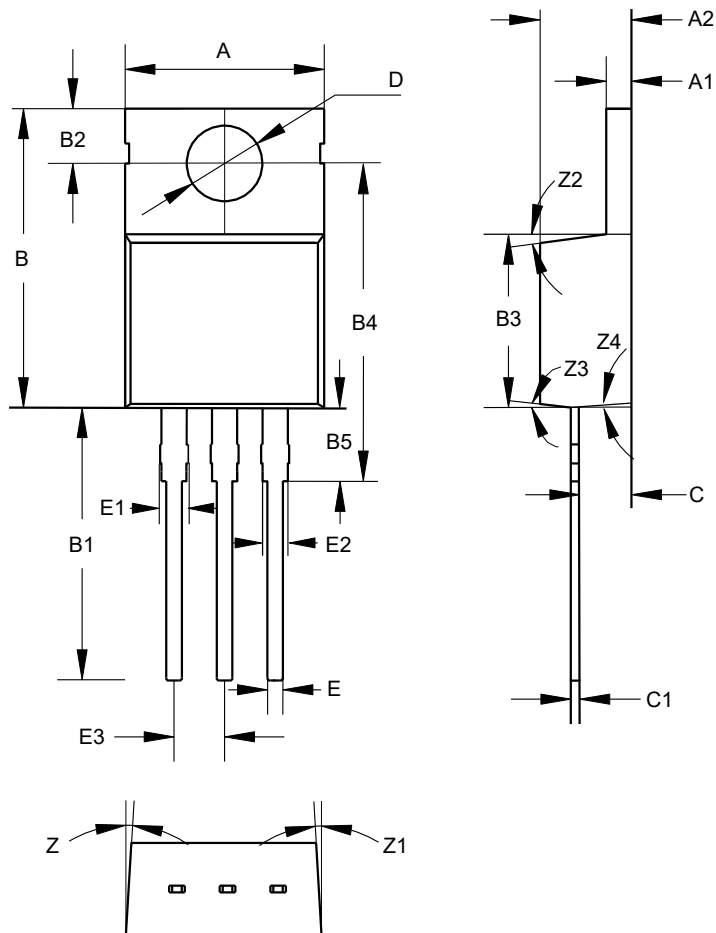
Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Fig.13 - Drain Current Derating



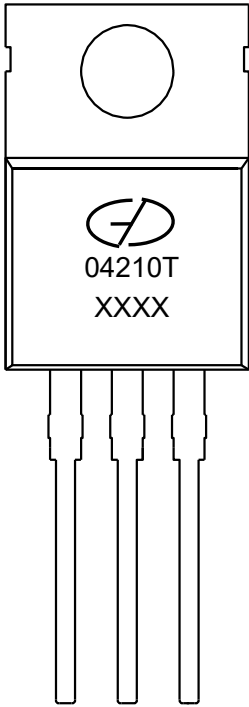
Package Outline Dimensions (Unit: millimeters)

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: GMN04210T

1. Logo Mark: 
2. P/N Mark: 04210T
3. Date Code: XXXX

Revision History

Version	Date	Major Changes
Rev.A	2024.06.15	Official Release

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