GOSTONE

RoHS COMPLIANT

N-Channel 20V,12mΩ , Power MOSFET

GMT120D02B1

Product Summary

V_{DS} (V)	$R_{DS(on),Typ}$ (mΩ)	I_D (A)
20	12 @ V_{GS} = 4.5V	12

View and Internal Schematic Diagram

TSSOP-8

NOTE:
LOGO - GS
GMT120D02B1 Part number code
F - Fab location code
A - Assembly location code
Y - Year code
WW - Week code
L&T - Assembly lot code

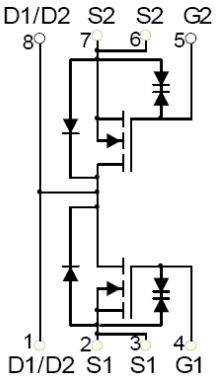
Features

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

- Uni-directional load switch
- Bi-directional load switch

Equivalent circuit



Absolute maximum rating@25℃

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	20	V
Gate-source voltage	V_{GS}	±12	
Continuous drain current (V_{GS}=-4.5V) T_A=25℃	I_D	12	A
Pulsed drain current[d]	$I_{D,pulse}$	45	A
Power dissipation T_A=25℃	P_D	2	W
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	℃

Thermal Characteristic

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient [C]	$R_{\theta JA}$	62.5		℃/W

Electrical Characteristics (TJ=25℃ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static[a]						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 μA	20			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	0.5	0.74	1.0	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 10 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V			1	μA
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 5 A		12	13.2	mΩ
		V_{GS} = 3.9V, I_D = 3 A		13.2	15	
Forward Transconductance[a]	g_{fs}	V_{DS} = 5 V, I_D = 8 A		15		S
Body Diode Voltage	V_{SD}	I_S = 1 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = 10 V, V_{GS} = 0V, f=1 MHz		1800		pF
Output Capacitance	C_{oss}			230		
Reverse Transfer Capacitance	C_{rss}			200		
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 8 A		17.9		nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			4.7		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 1.2 Ω Vgs= 10 V, R_{gen} = 3 Ω		2.5		ns
Rise Time	t_r			7.2		
Turn-Off Delay Time	$t_{d(off)}$			49		
Fall Time	t_f			10.8		

Notes

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Surface Mounted on FR4 Board, t ≤10 sec.
d. Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Performance Characteristics

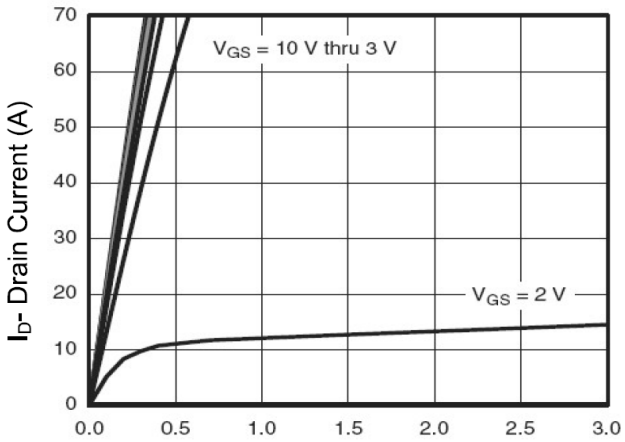


Figure 1 Output Characteristics

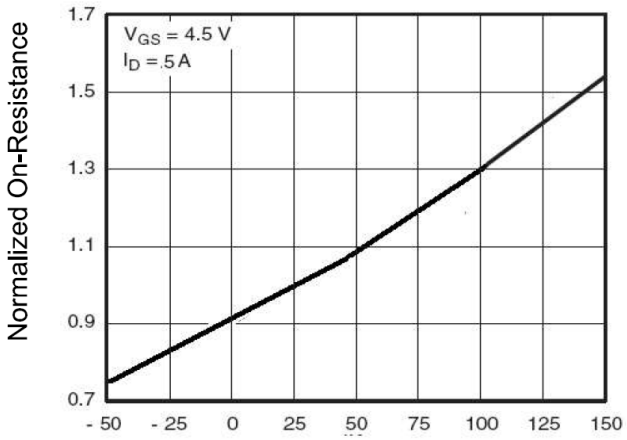


Figure 2 Rdson-Junction Temperature

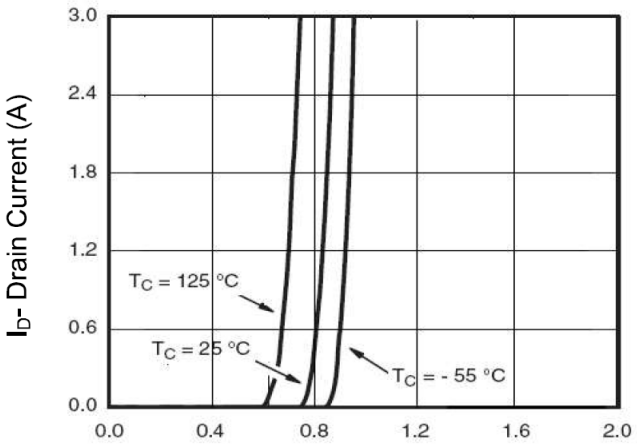


Figure 3 Transfer Characteristics

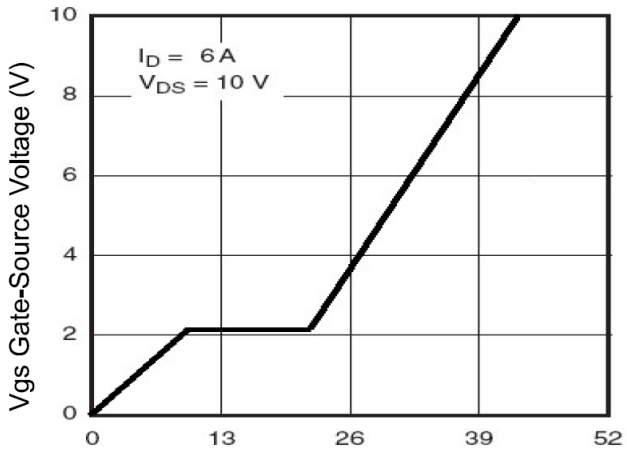


Figure 4 Gate Charge

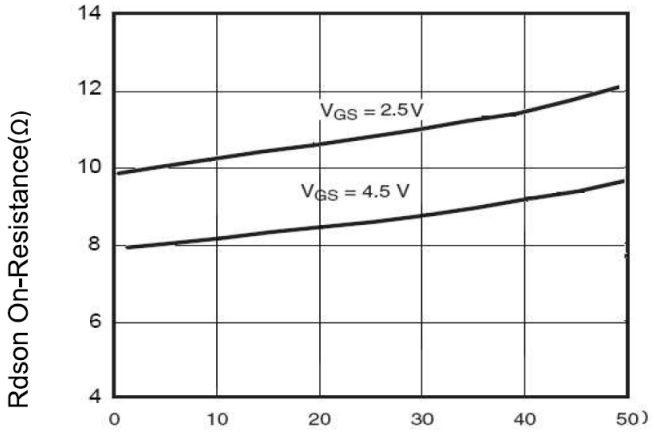


Figure 5 Rdson- Drain Current

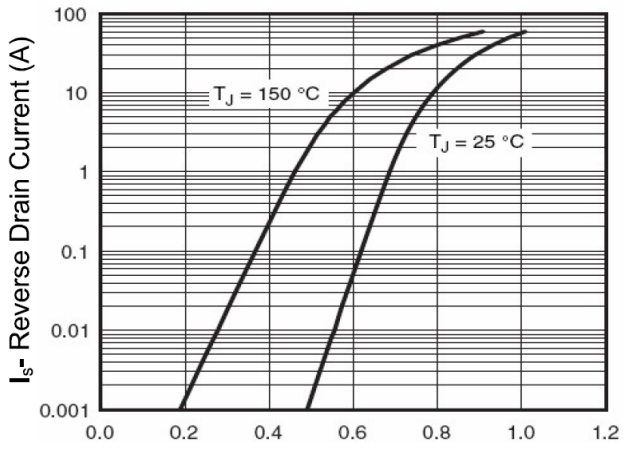


Figure 6 Source- Drain Diode Forward

Typical Performance Characteristics

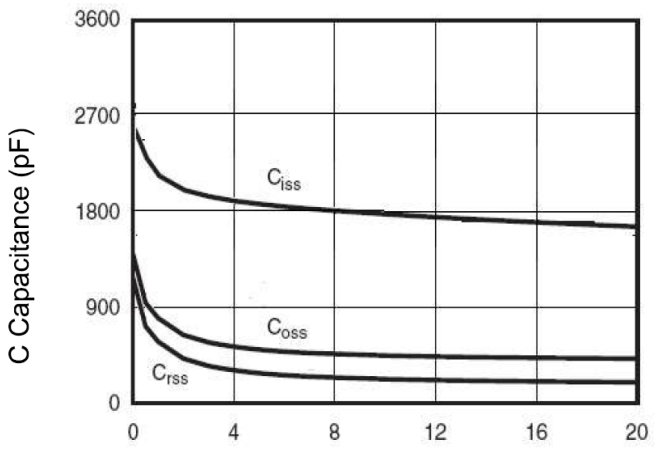


Figure 7 Capacitance vs Vds

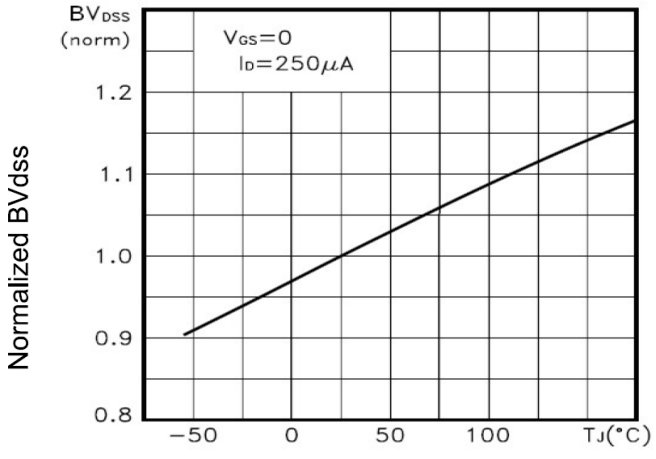


Figure 8 BV_{DSS} vs Junction Temperature

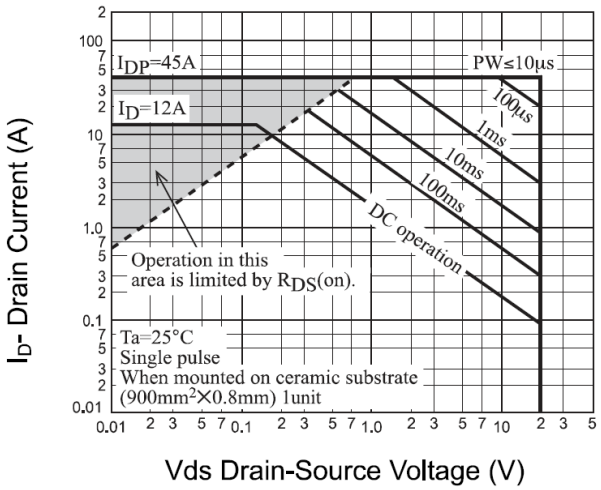


Figure 9 Safe Operation Area

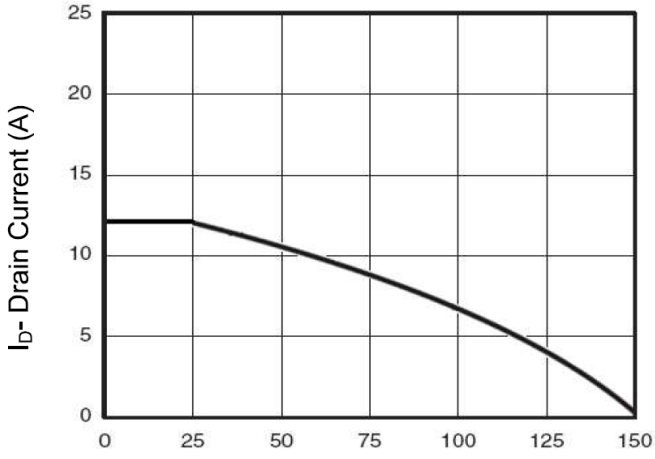


Figure 10 Current vs Junction Temperature

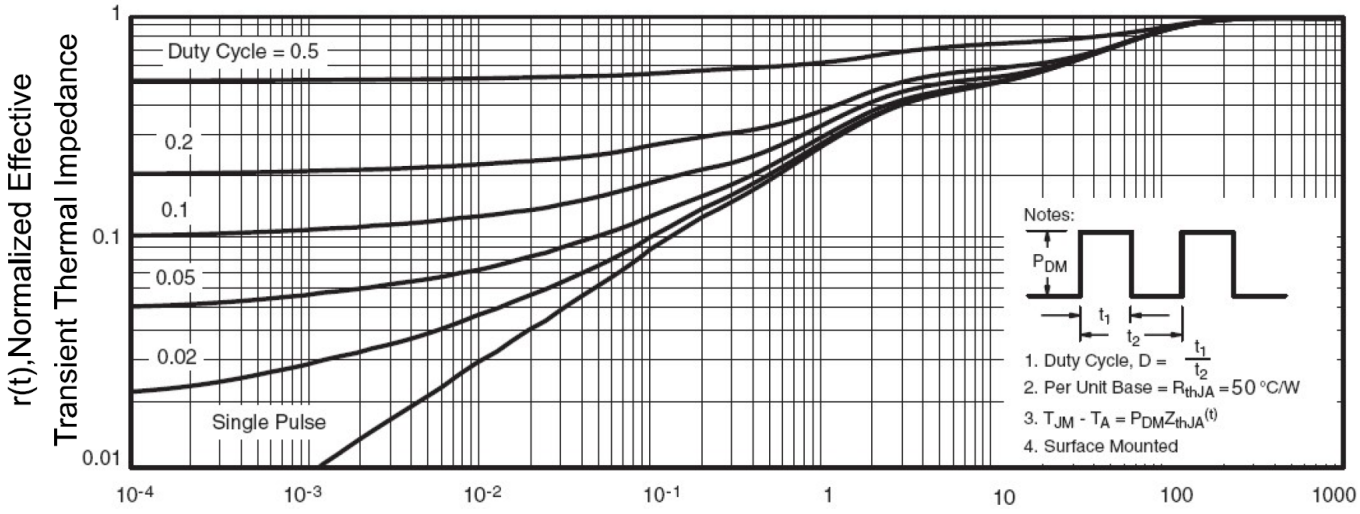
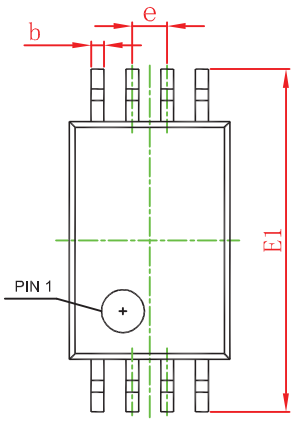
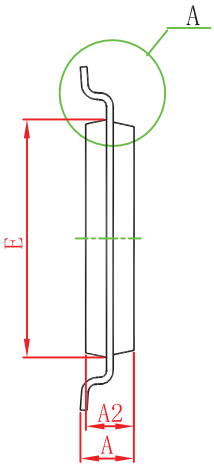
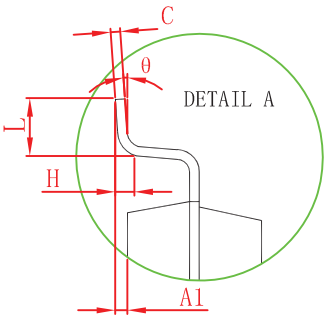


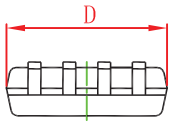
Figure 11 Normalized Maximum Transient Thermal Impedance

Outline Drawing TSSOP-8









Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	**Max**	**Min**	**Max**
D	2.900	3.100	0.114	0.122
E	4.300	4.500	0.169	0.177
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
E1	6.250	6.550	0.246	0.258
A		1.200		0.047
A2	0.800	1.000	0.031	0.039
A1	0.050	0.150	0.002	0.006
e	0.65 (BSC)		0.026(BSC)	
L	0.500	0.700	0.020	0.028
H	0.25(TYP		0.01(TYP	
θ	1°	7°	1°	7°

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