GOSTONE

RoHS COMPLIANT

P-Channel -20V, 22mΩ max, MOSFET

GMT220P02H2

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
-20	22 @ V_{GS} = -4.5V	-7

General Information

Shipping

- One shipping options is offered as standard
- Un-sawn wafer

Handling

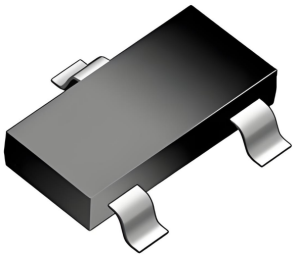
- Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- Product must be handled only in a class 10,000 or better-designated clean room environmen

Features

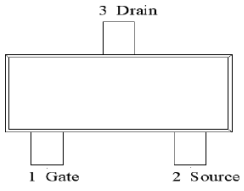
- Fast Switching
- Low On-Resistance
- Low Gate Charge

Application

- Load Switch
- Motor Control
- Power Management

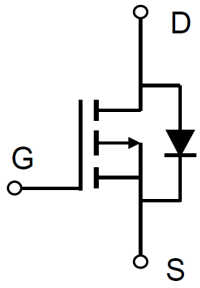


SOT23-3L



PIN Configuration
(Top View)

Equivalent circuit



Absolute Maximum Rating (Ta=25°C)

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	-20	V
Gate-source voltage		V_{GS}	±12	
Continuous drain current (V_{GS}=-4.5V)(1)	T_A=25℃	I_D	-7	A
	T_A=70℃		-5.4	
Pulsed drain current(2)		$I_{D,pulse}$	-30	
Power dissipation	T_A=25℃	P_D	1.31	W
	T_A=70℃		0.74	W
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	℃

Thermal Characteristic (Ta=25°C)

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient (3)	$R_{\theta JA}$	125	---	℃/W
Thermal Resistance, Junction-to-case (3)	$R_{\theta JC}$	7.4	---	℃/W

Electrical characteristics (Ta=25°C ± 3°C)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter (4)						
Drain to source breakdown voltage	$V_{(BR)DSS}$	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	-0.45	-0.65	-0.9	V
Gate-body leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12 V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = -20 V, V_{GS} = 0 V			-1	μA
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -4.1 A		18.9	22	mΩ
		V_{GS} = -2.5V, I_D = -2.5 A		23.1	25.1	mΩ
Forward transconductance	g_{fs}	VDS = -5.0V, ID = -3A		12.8		S
Gate resistance	R_g	VGS = 0V, VDS = 0V, f = 1MHz		21		Ω
Dynamic(5)						
Total gate charge	Q_g	VDS = -15V, ID = -3A VGS = -4.5V		10.2		nC
Gate-source charge	Q_{gs}			1.89		
Gate-drain charge	Q_{gd}			3.1		
Turn-on delay time	$t_{d(on)}$	VGS = -4.5V, VDS = -10V ID = -3A, R_{GEN} = 3.3		5.6		ns
Rise time	t_r			40.8		
Turn-off delay time	$t_{d(off)}$			33.6		
Fall time	t_f			18		
Input capacitance	C_{iss}	V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHz		857		pF
Output capacitance	C_{oss}			114		
Reverse transfer capacitance	C_{rss}			108		
Reverse Diode Characteristics (5)						
Diode forward voltage	V_{SD}	IS = -2.0A, VGS = 0V		-0.8	-1.2	V
Diode Forward Current	I_s	TA = 25°C			-7	A
Reverse Recovery Time	V_{SD}	IF= -3.0A, di/dt=100A/μs, TJ = 25°C		21.8		nS
Reverse Recovery Charge	I_s			6.9		nC

Notes

1. This current is chip limited, whiich is calculated based on Rthjc.
2. This current is calculated on single pulse with 10μs Pulse & Duty Cycle = 1%.
3. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.
4. Short duration pulse test used to minimize self-heating effect.
5. Defined by design, not subject to production.

Electrical characteristics diagrams

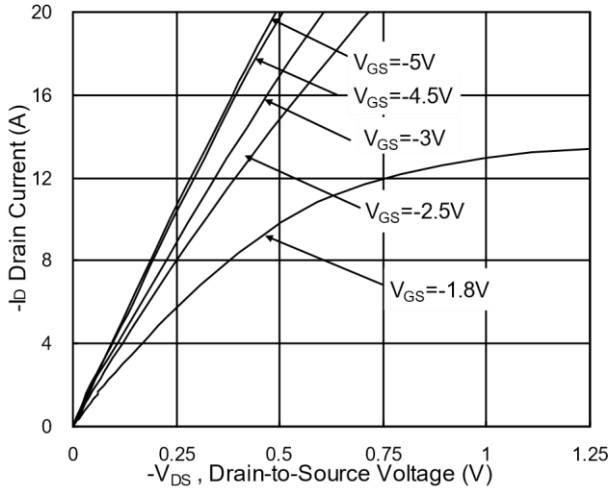


Fig.1 Typical Output Characteristics

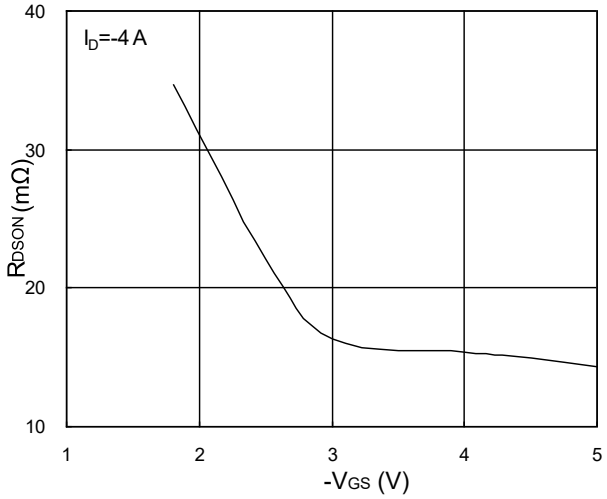


Fig.2 On-Resistance vs. Gate-Source

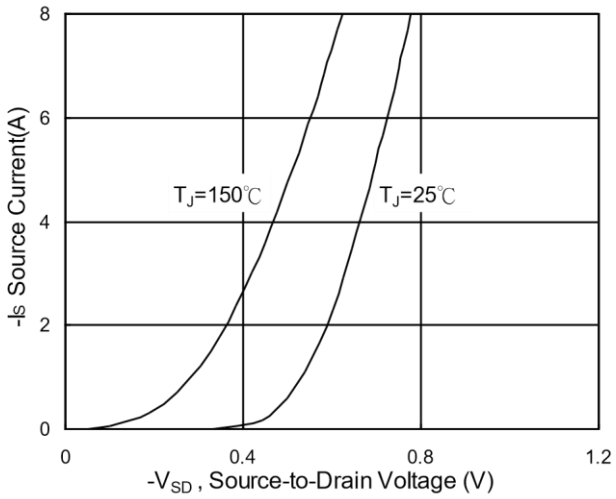


Fig.3 Forward Characteristics Of Reverse

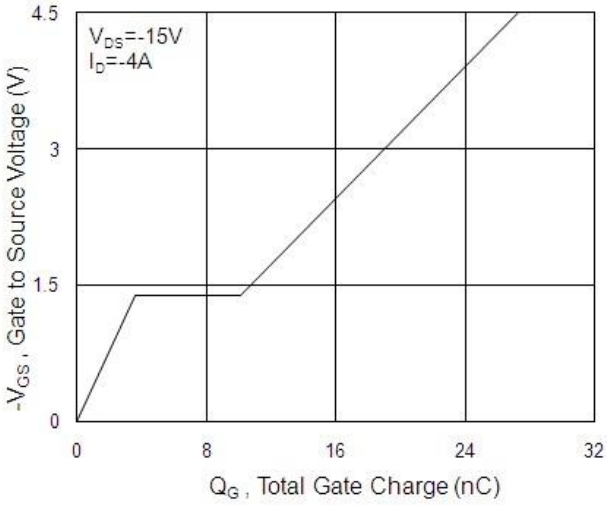


Fig.4 Gate-Charge Characteristics

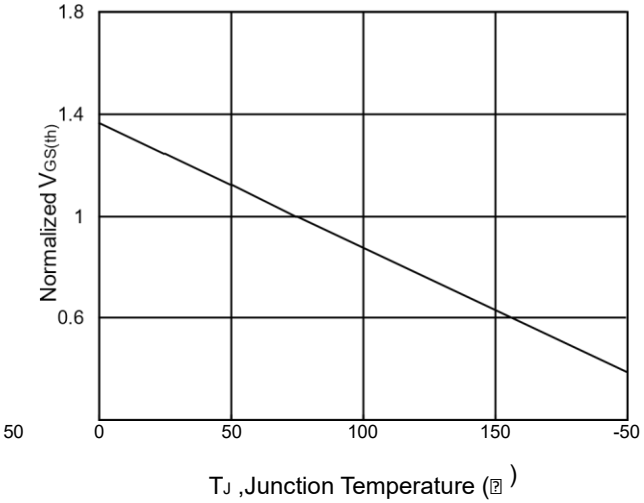


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

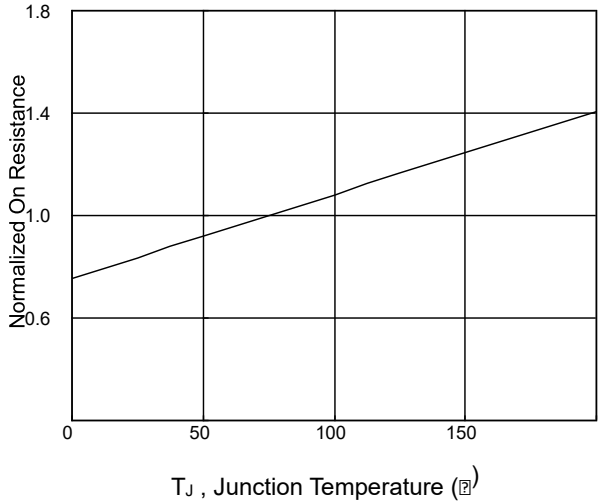


Fig.6 Normalized R_{DSON} vs. T_J

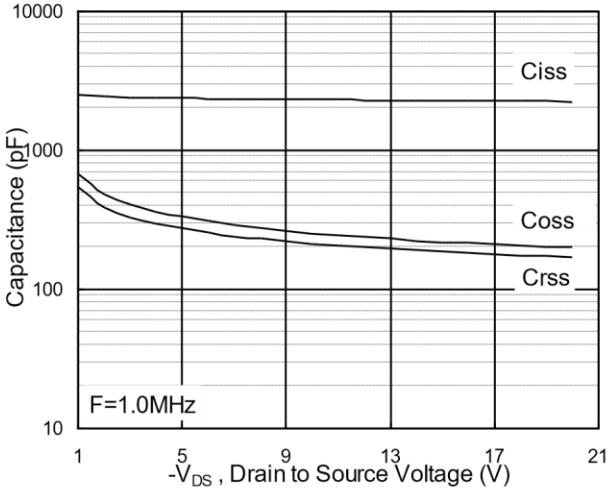


Fig.7 Capacitance

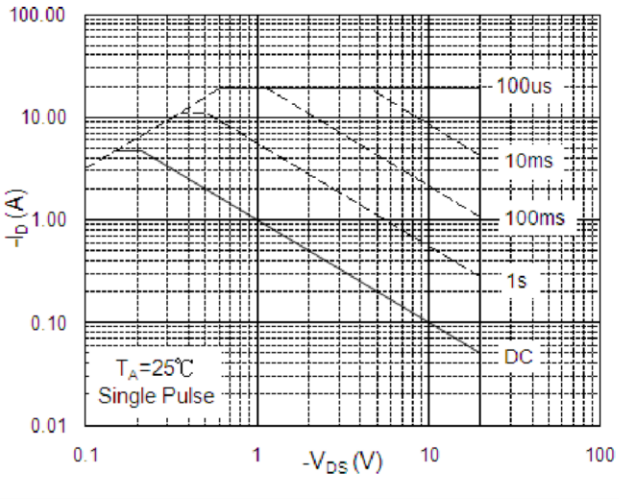


Fig.8 Safe Operating Area

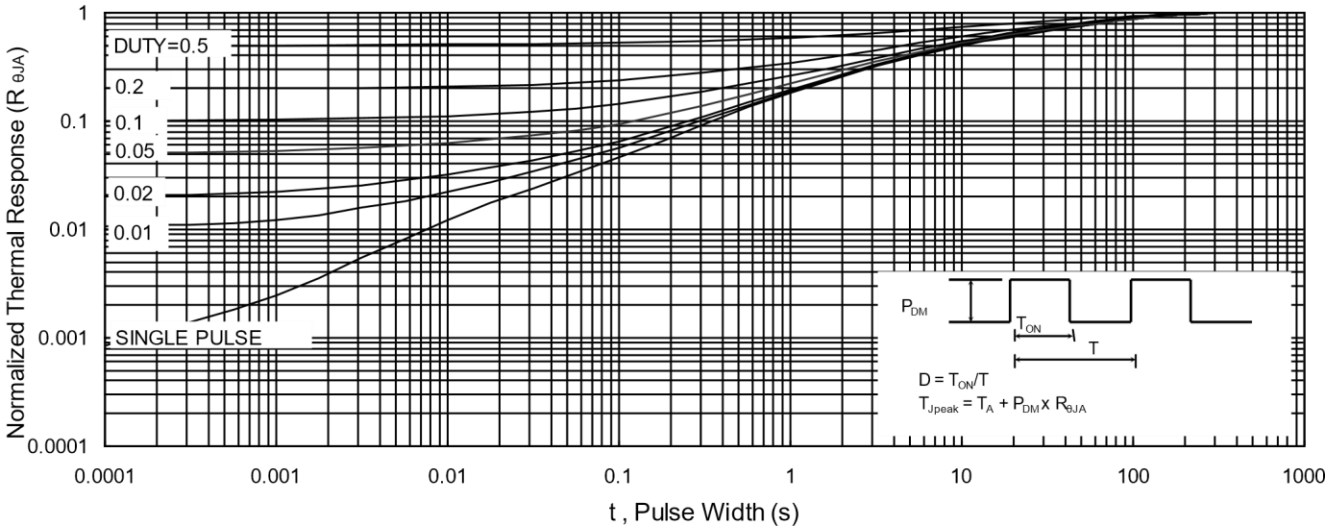
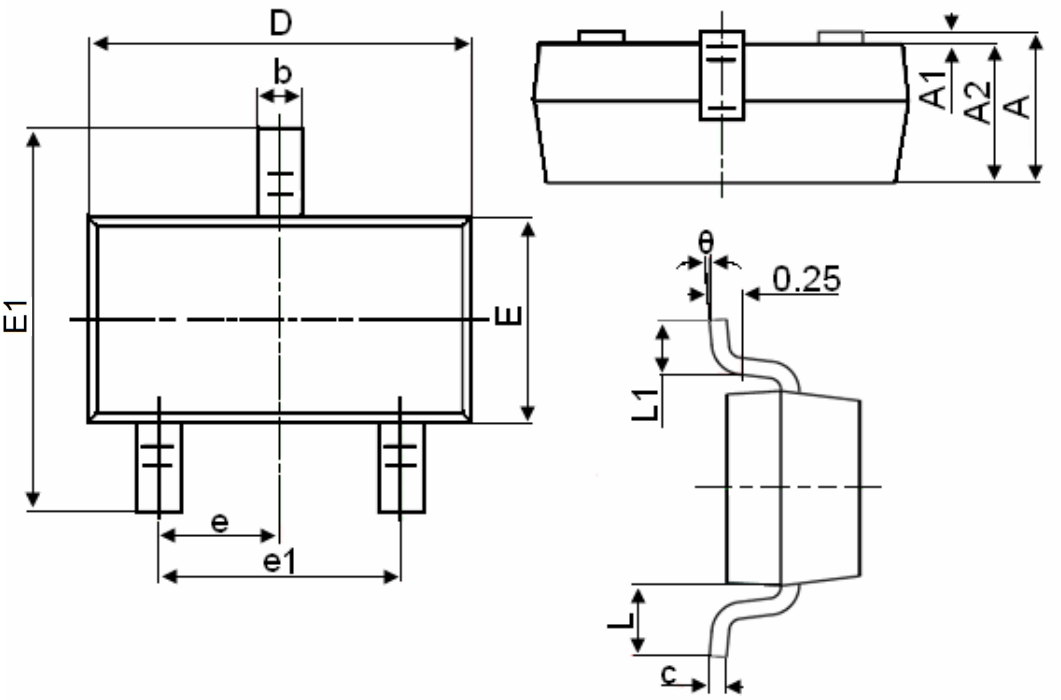


Fig.9 Normalized Maximum Transient Thermal Impedance

Package outline dimensions SOT23-3L



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.90	1.150
A1	0.0	0.100
A2	0.9	1.050
b	0.30	0.500
c	0.08	0.150
D	2.80	3.000
E	1.50	1.700
E1	2.65	2.950
e	0.950 TYP	
e1	1.8	2.000
L	0.55 REF	
L1	0.3	0.500
θ	0°	8°

Notes

1. Al dimensions are in millimeters.
2. olerance ±0.10mm (4 mil) unless otherwise specified
3. ackage body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. imension L is measured in gauge plane.
5. ontrolling dimension is millimeter, converted inch dimensions are not necessarily exact.

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