GOSTONE

RoHS COMPLIANT

P-Channel -20V, 30.5mΩ max, MOSFET

GMT410P02H1

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
-20	30.5 @ V_{GS} = -4.5V	-6

General Information

Shipping

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

Handling

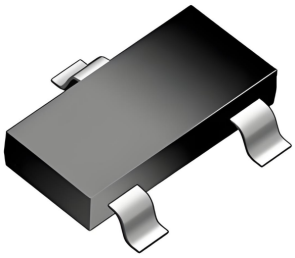
- Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- Product must be handled only in a class 10,000 or better-designated clean room environmen

Features

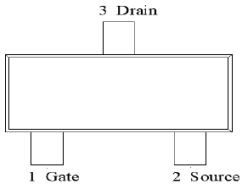
- Fast Switching
- Low On-Resistance
- Low Gate Charge

Application

- Load Switch
- Battery protection
- Motor Control
- Power Management

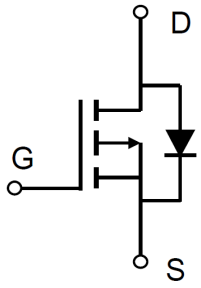


SOT-23



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	-6	A
	T_A=70℃		-4.5	
Pulsed drain current(2)		$I_{D,pulse}$	-18	
Power dissipation	T_A=25℃	P_D	3.81	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)	$R_{\theta JA}$	85	125	℃/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		33	40	mΩ
	$R_{DS(on)}$	V_{GS} = -2.5V, I_D = -3 A		43	50	mΩ
Forward transconductance	g_{fs}	VDS = -5.0V, ID = -4.1A		8.0		S
Gate resistance	R_g	VGS = 0V, VDS = 0V, f = 1MHz		21		Ω
Dynamic(5)						
Total gate charge	Q_g	VDS = -10V, ID = -2A VGS = -4.5V		5.6		nC
Gate-source charge	Q_{gs}			1.0		
Gate-drain charge	Q_{gd}			1.0		
Turn-on delay time	$t_{d(on)}$	VGS = -4.5V, VDS = -10V ID = -2A, RGEN = 3.0Ω		5		ns
Rise time	t_r			21		
Turn-off delay time	$t_{d(off)}$			110		
Fall time	t_f			239		
Input capacitance	C_{iss}	V_{DS} = -10 V, V_{GS} = 0 V, f = 1 MHz		534		pF
Output capacitance	C_{oss}			62		
Reverse transfer capacitance	C_{rss}			50		
Reverse Diode Characteristics (5)						
Diode forward voltage	V_{SD}	IS = -2.0A, VGS = 0V		-0.71	-1.2	V
Diode Forward Current	I_s	TA = 25°C			-6	A
Body Diode Reverse Recovery Time	trr	I_F = -2A, di/dt = 100A/us	-	64	-	ns
Body Diode Reverse Recovery Charge	Qrr		-	10	-	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

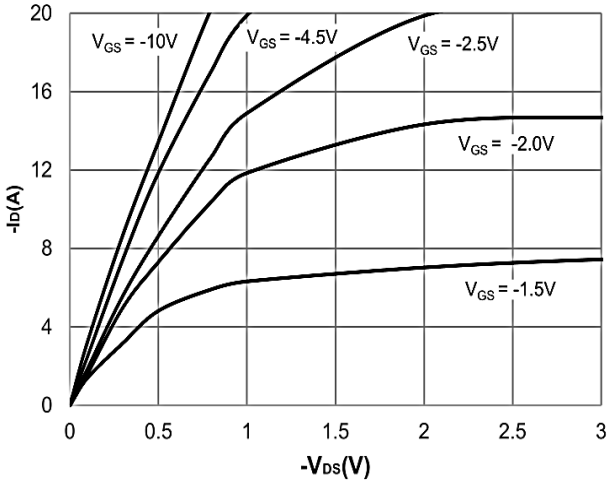


Figure 1: Output Characteristics

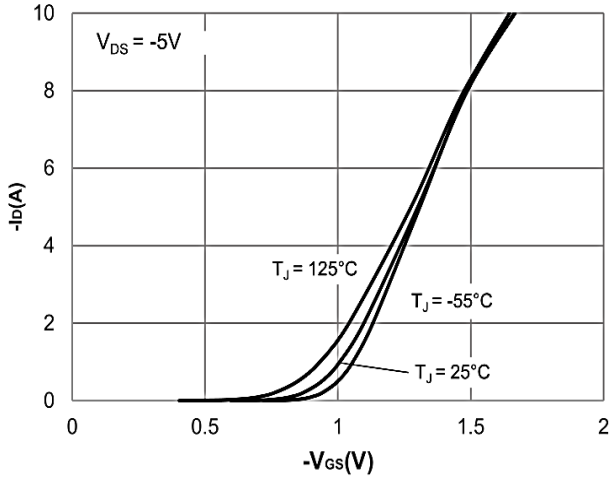


Figure 2: Typical Transfer Characteristics

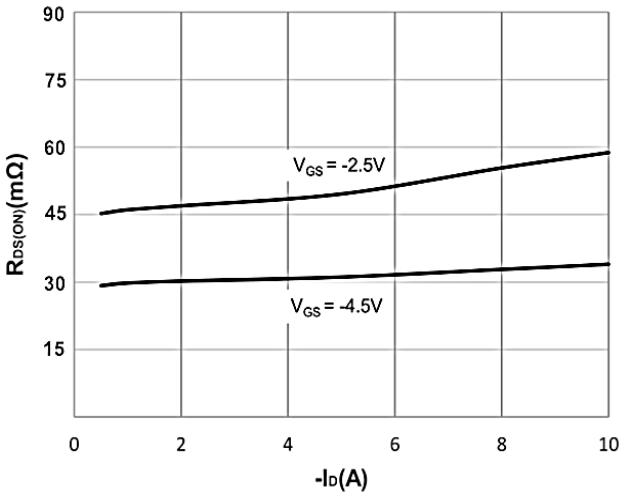


Figure 3: On-resistance vs. Drain Current

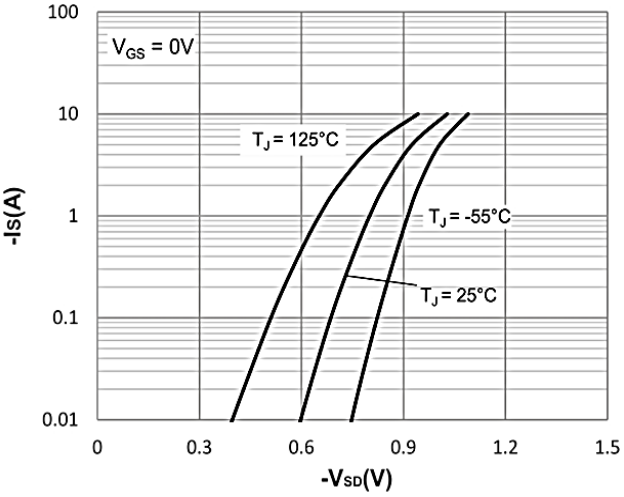


Figure 4: Body Diode Characteristics

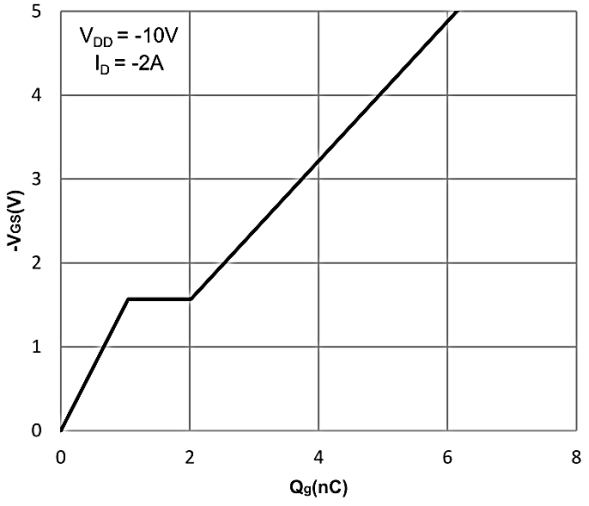


Figure 5: Gate Charge Characteristics

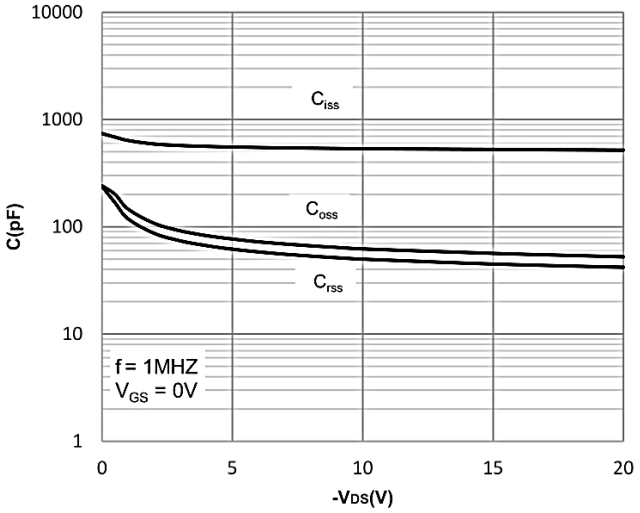


Figure 6: Capacitance Characteristics

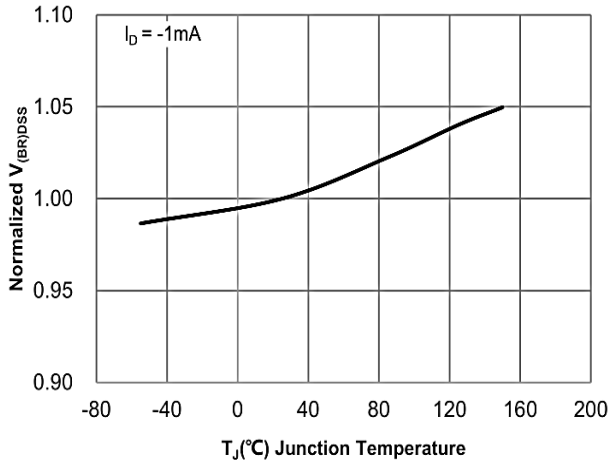


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

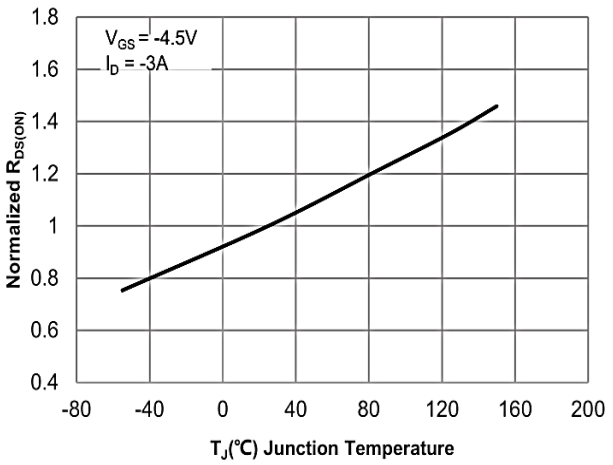


Figure 8: Normalized on Resistance vs. Junction Temperature

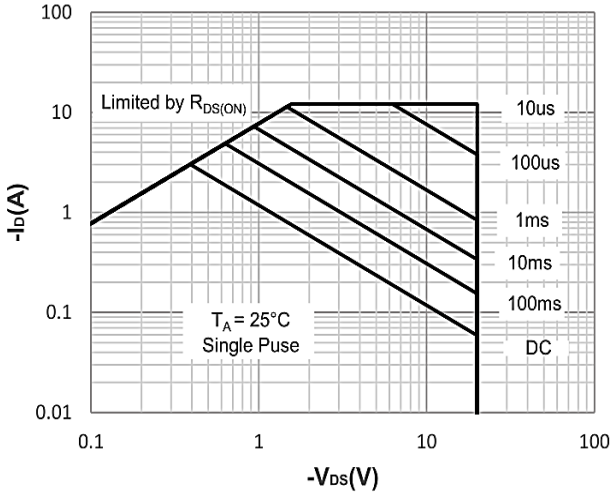


Figure 9: Maximum Safe Operating Area

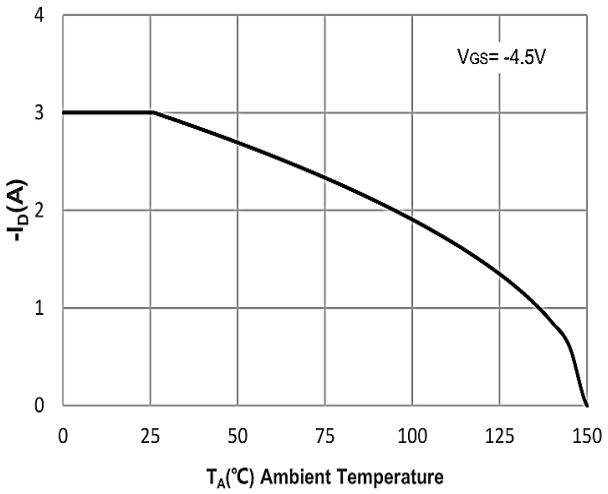


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

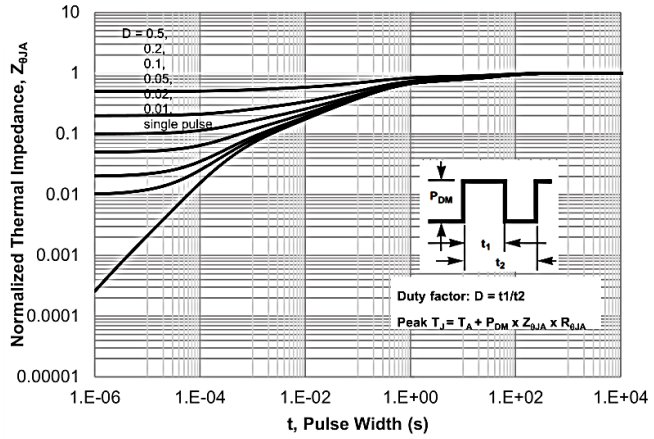


Figure 11: Normalized Maximum Transient Thermal Impedance

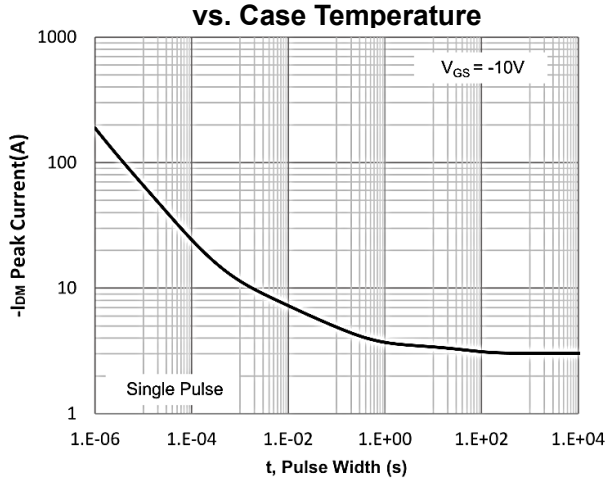
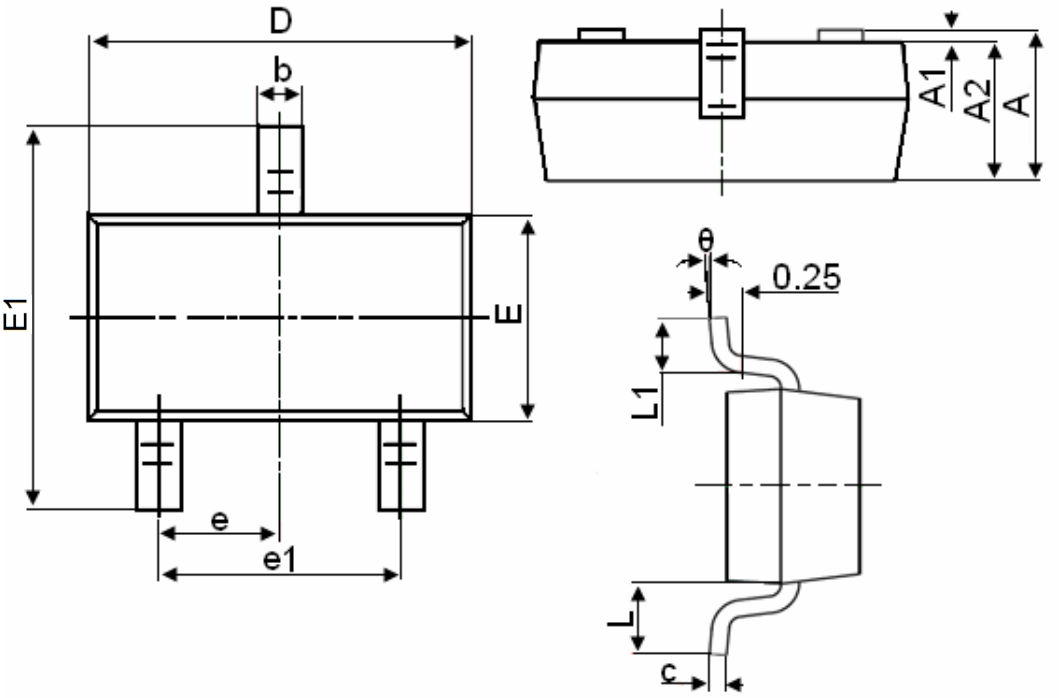


Figure 12: Peak Current Capacity

Package outline dimensions SOT-23



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	1.20	1.400
E1	2.2	2.550
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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