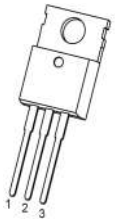
100V N-Channel SGT Power MOSFET

Product Summary

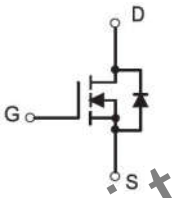
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	2.5mΩ@10V	180A

TO-220C



PIN1:GATE
PIN2:DRAIN
PIN3:SOURCE

Schematic diagram



Features

- Fast switching
- 100% EAS Guaranteed
- Green device available

Applications

- Motor Drives
- UPS
- DC-DC Converter
- SR
- BMS

Marking

G023N10 : Device Code
YY : Year Code
WW : Week Code

Absolute Maximum rating（T_A = 25℃ unless otherwise noted）

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	100	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25°C ,Silicon limit	I_D	235	A
	T_C = 25°C, Package limit		180	
	T_C = 100°C,Silicon limit		150	
Pulsed drain current		I_{DM}	720	A
Avalanche energy[1]		E_{AS}	900	mJ
Power Dissipation		P_D	300	W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.42	℃/W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~ +150	℃
Soldering temperature, wave soldering only allowed		T_{sold}	260	℃

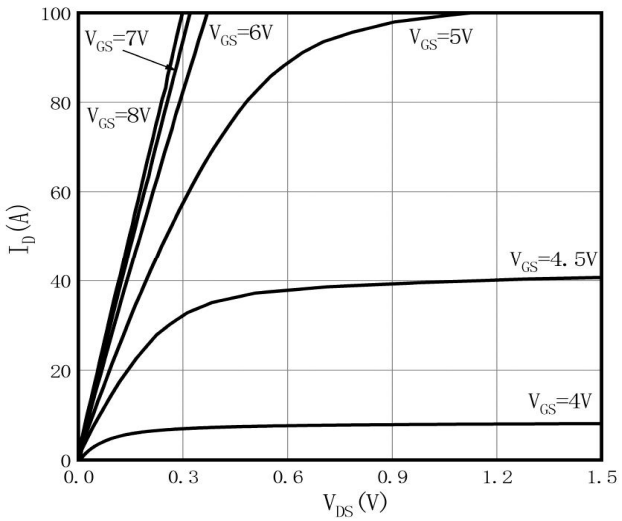
Electrical Characteristics（T_A = 25℃ unless otherwise noted）

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
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, T_J= 25°C			1	μA
		V_{DS}= 100V, V_{GS}= 0V, T_J= 125°C			100	
Gate - Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= 250μA	2	3	4	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS}= 10V, I_D= 50A, T_J= 25℃		2.5	3.0	mΩ
		V_{GS}= 10V, I_D= 50A, T_J= 150℃		4.5		
Forward transconductance	g_{FS}	V_{DS}= 20V, I_D= 50A		100		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}= 50V,V_{GS}= 0V,f= 1MHz		8600		pF
Output Capacitance	C_{oss}			1150		
Reverse Transfer Capacitance	C_{rss}			57		
Gate resistance	R_g	V_{DS}= 0V,V_{GS}= 0V, f= 1MHz		1.1		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}= 50V, I_D= 50A, V_{GS}= 10 V		150		nC
Gate-source Charge	Q_{gs}			35		
Gate-drain Charge	Q_{gd}			43		
Gate plateau voltage	$V_{plateau}$			4.5		V
Output Charge	Q_{oss}	V_{DS}= 50V, V_{GS}= 0V		150		nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 50V, V_{GS}= 10V, I_D= 50A, R_g=10Ω		77		ns
Turn-on Rise Time	t_r			160		
Turn-off Delay Time	$t_{d(off)}$			175		
Turn-off Fall Time	t_f			80		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}= 0V, I_S= 50A			1.2	V
Peak reverse recovery current	I_{rrm}	I_F= 50A, dI/dt= 100A/μs		2.85		A
Reverse Recovery Time	t_{rr}			60		ns
Reverse Recovery Charge	Q_{rr}			105		nC

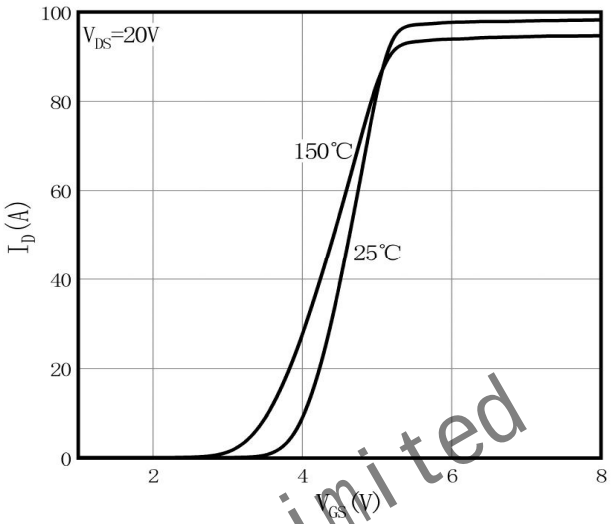
Notes :

1. E_{AS} condition: T_J=25℃,V_{DD}=50V,V_G=10V, R_g=25Ω, L=0.5mH.

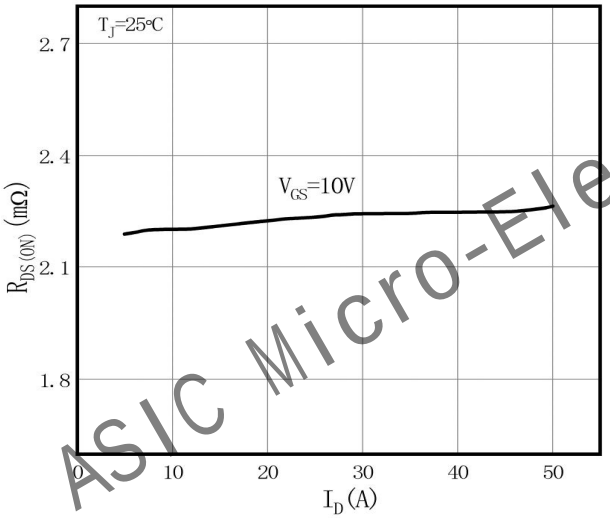
Typical Characteristic



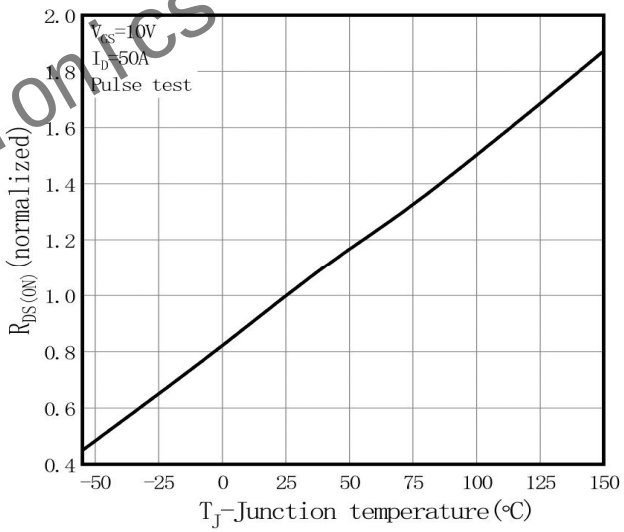
Output Characteristics



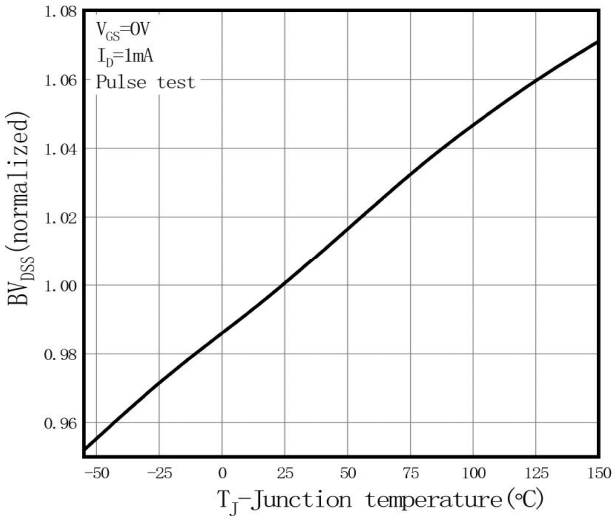
Transfer Characteristic



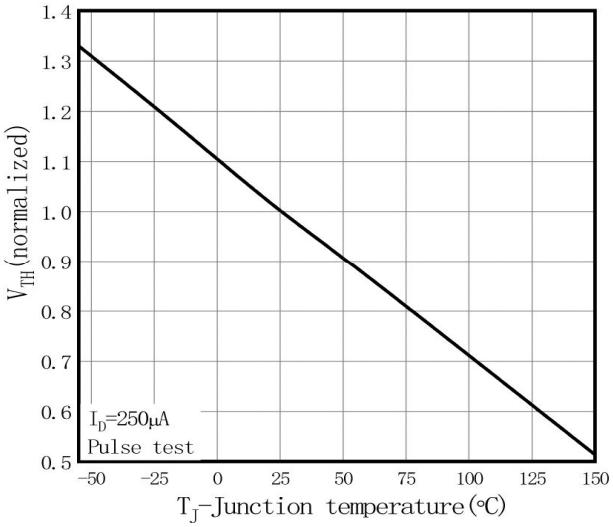
On-Resistance vs. Drain Current



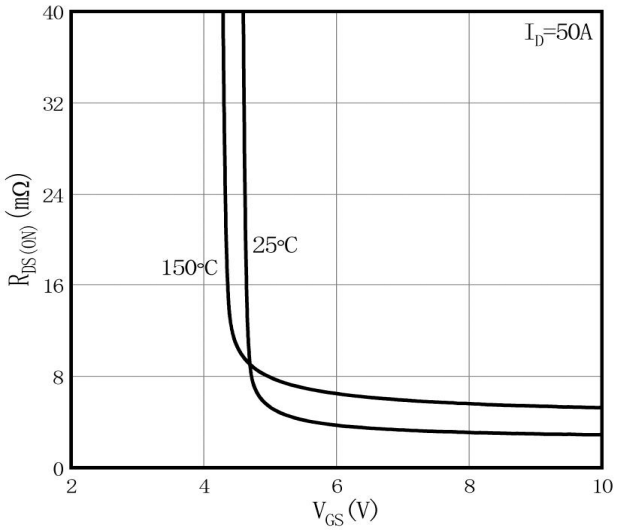
On-Resistance vs. Temperature



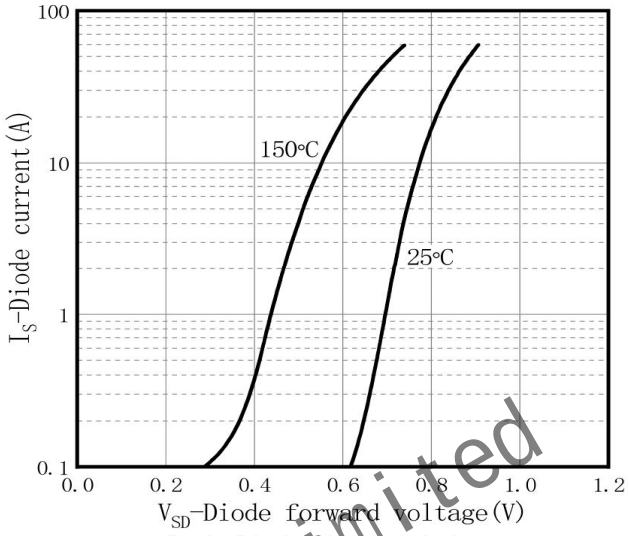
Breakdown Voltage vs. Temperature



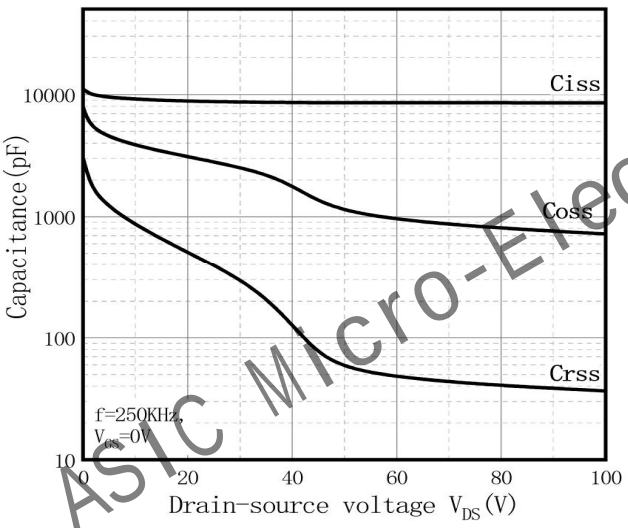
Threshold Voltage vs. Temperature



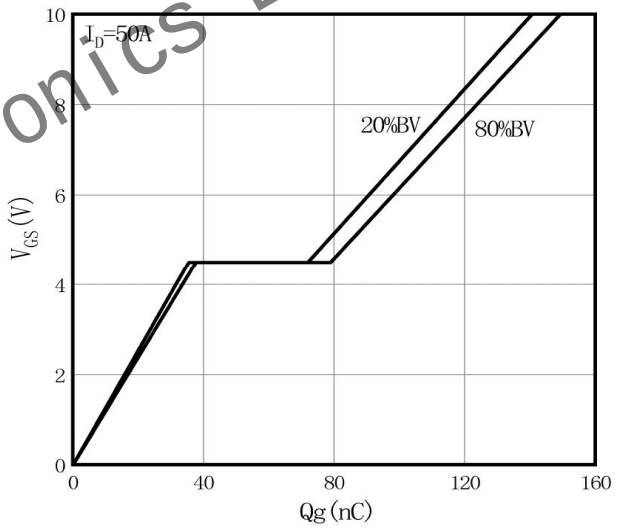
On-Resistance vs. Gate Voltage



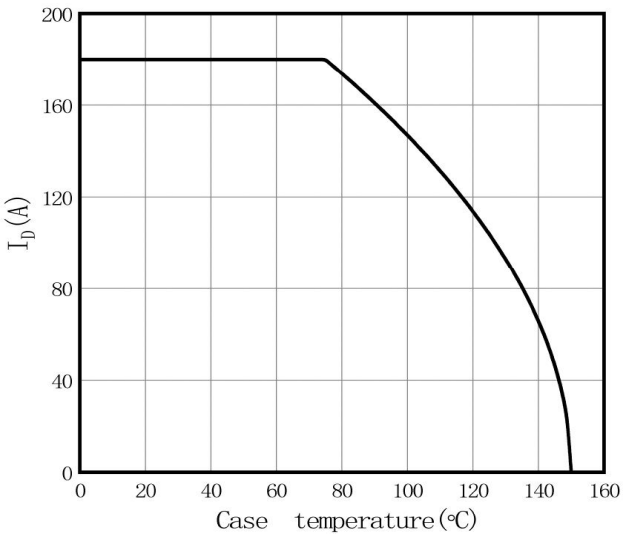
Body-Diode Characteristics



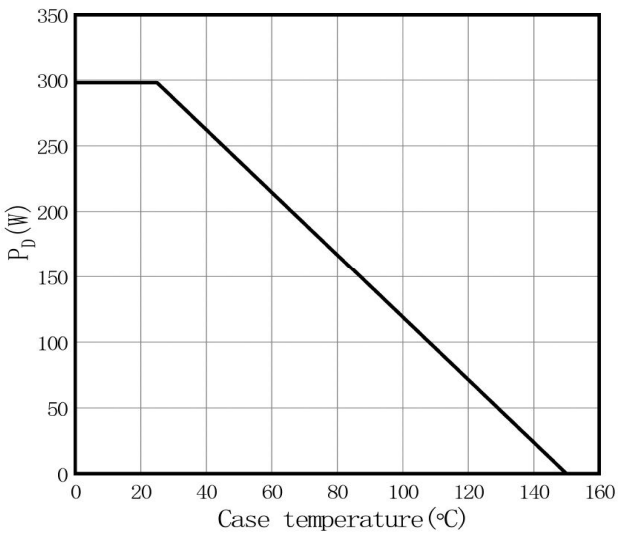
Capacitance Characteristics



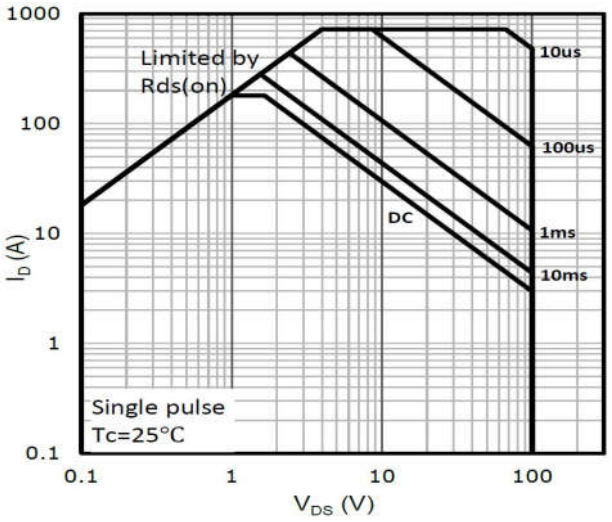
Gate Charge Characteristics



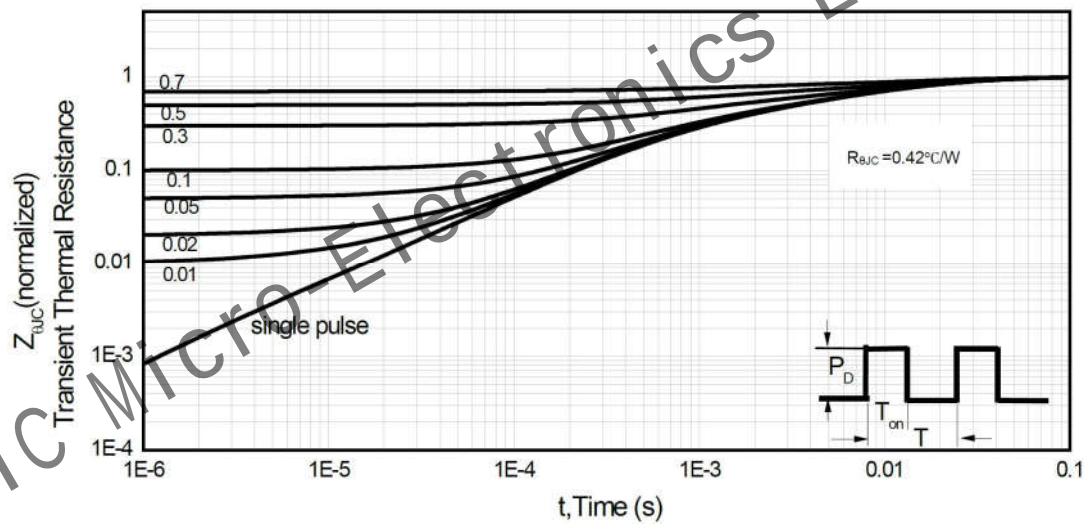
Drain Current



Power Dissipation



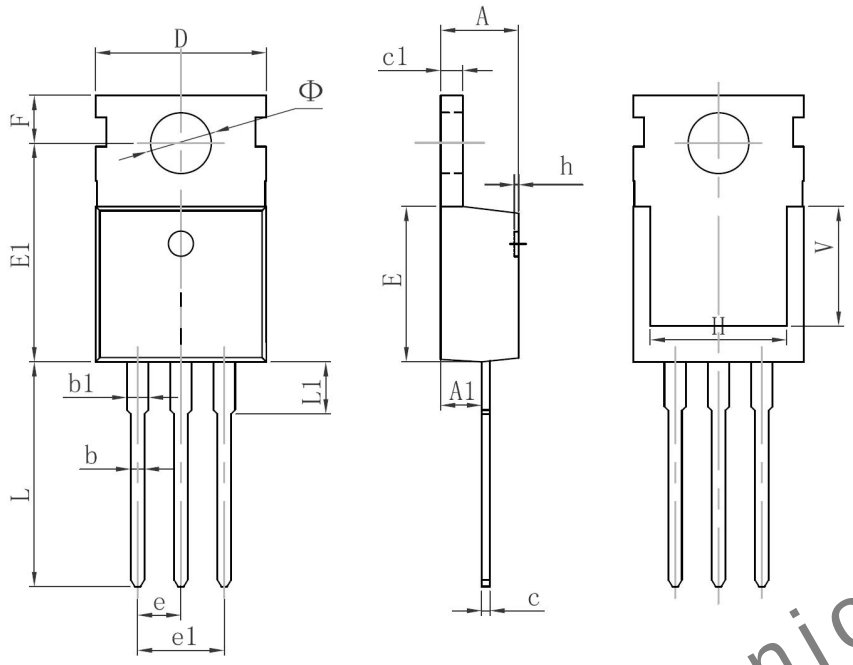
Maximum Safe Operating Area



Normalized Maximum Transient Thermal Impedance (R_{thJC})

Dimension

TO-220C



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	4.400	4.600	0.17	0.18
A1	2.250	2.550	0.08	0.10
b	0.710	0.910	0.02	0.03
b1	1.170	1.370	0.04	0.05
c	0.330	0.650	0.01	0.02
c1	1.200	1.400	0.04	0.05
D	9.910	10.25	0.39	0.40
E	8.950	9.750	0.35	0.38
E1	12.65	12.95	0.49	0.51
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.19	0.20
F	2.650	2.950	0.10	0.11
H	7.900	8.100	0.31	0.31
h	0.000	0.300	0.00	0.01
L	12.90	13.40	0.50	0.52
L1	2.850	3.250	0.11	0.12
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.13	0.15
A	4.400	4.600	0.17	0.18
A1	2.250	2.550	0.08	0.10