

100V N-Channel SGT Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	2.4m Ω @10V	180A

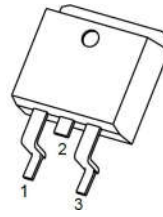
Features

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

Applications

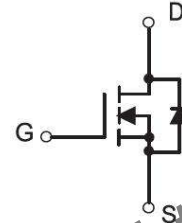
- Motor Drives
- UPS
- DC-DC Converter
- SR
- BMS

TO-263-2L



PIN1:GATE
PIN2:DRAIN
PIN3:SOURCE

Schematic diagram



Marking



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

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

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	100	V
Gate - Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$, Silicon limit	I_D	235	A
	$T_C = 25^\circ\text{C}$, Package limit		180	
	$T_C = 100^\circ\text{C}$, 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	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~ +150	$^\circ\text{C}$
Soldering temperature, wave soldering only allowed		T_{sld}	260	$^\circ\text{C}$

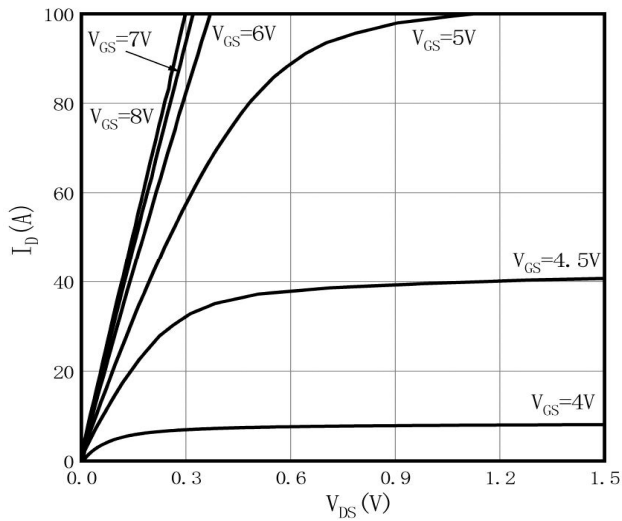
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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°C		2.3	2.9	mΩ
		V _{GS} = 10V, I _D = 50A, T _J = 150°C		4.4		
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

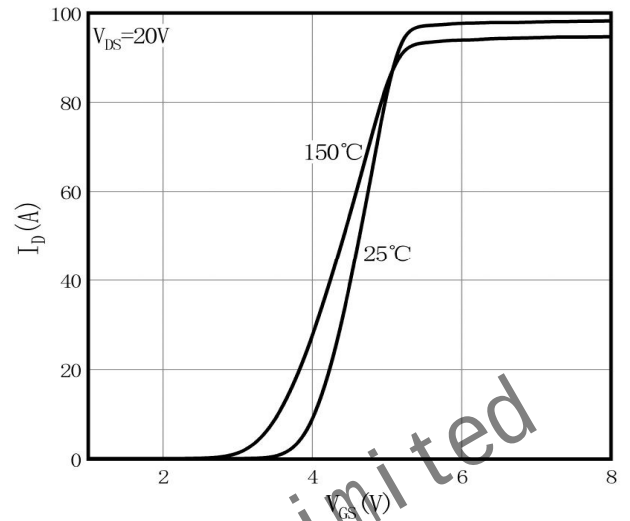
Notes :

1. E_{AS} condition: $T_J = 25^\circ\text{C}, V_{DD} = 50V, V_G = 10V, R_g = 25\Omega, L = 0.5mH$.

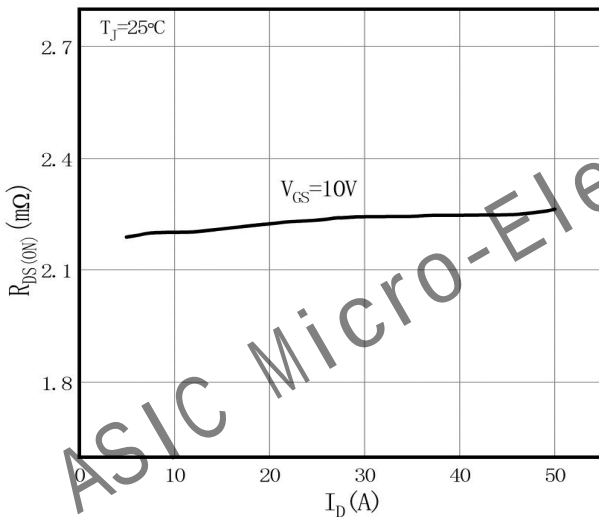
Typical Characteristic



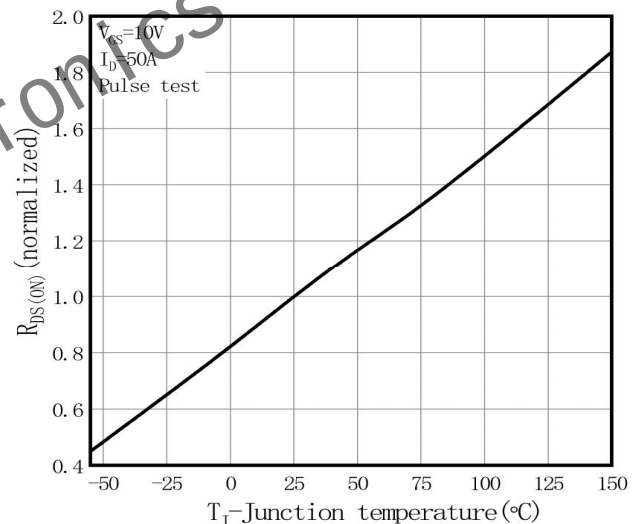
Output Characteristics



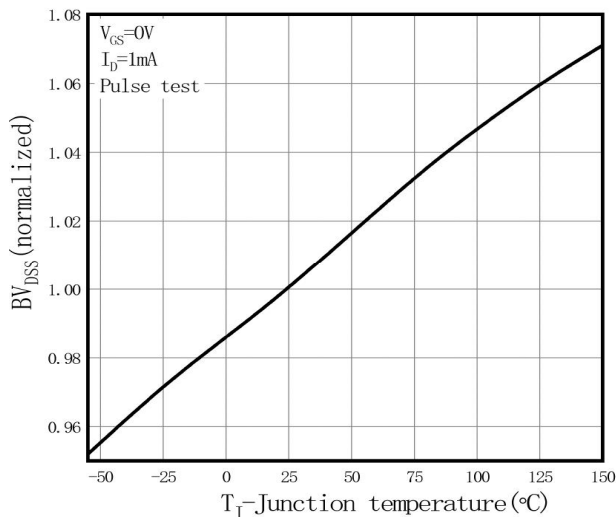
Transfer Characteristic



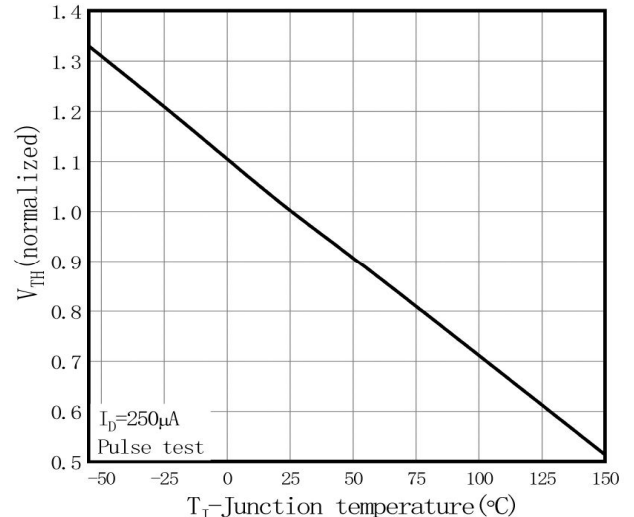
On-Resistance vs. Drain Current



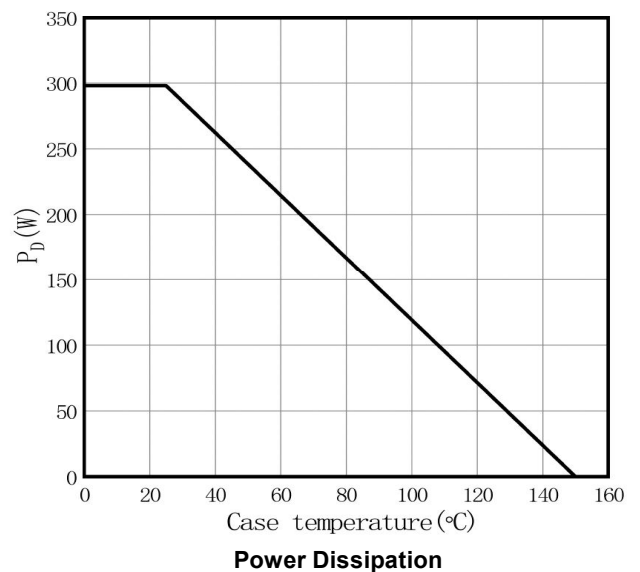
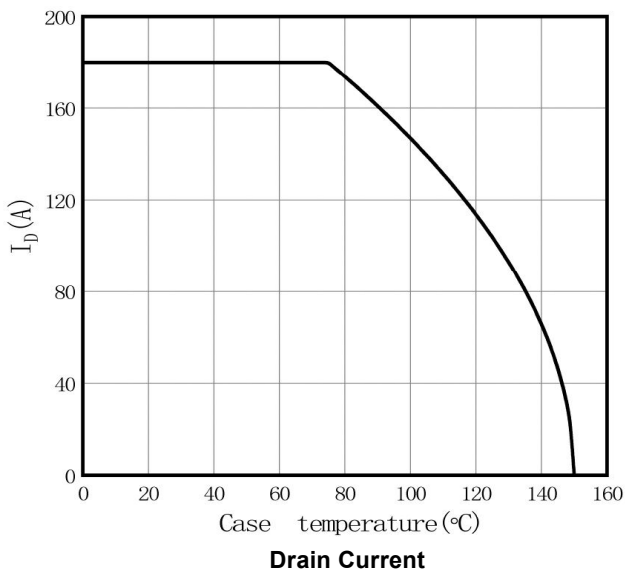
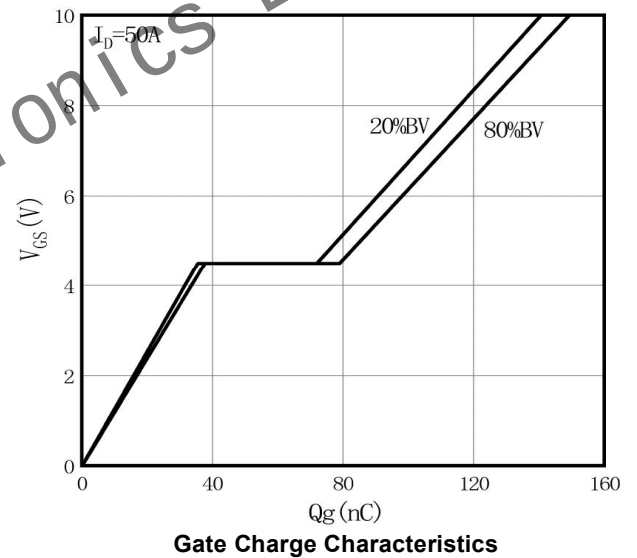
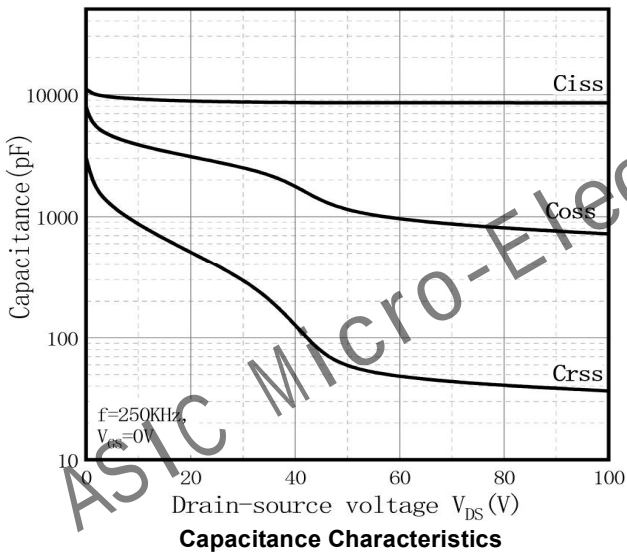
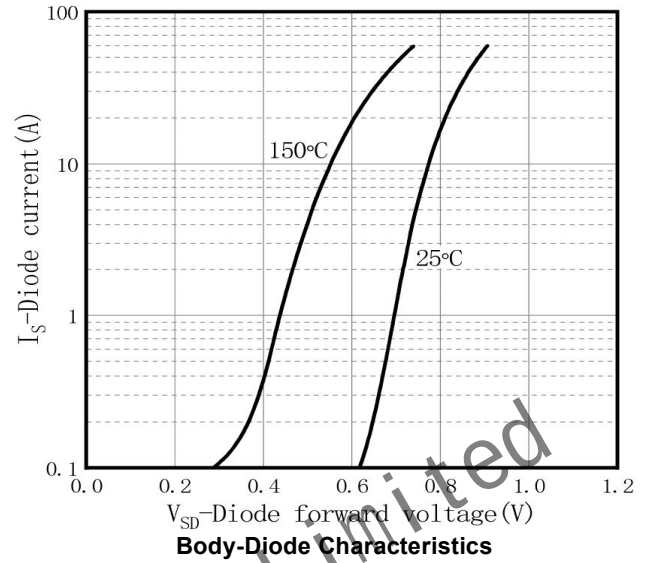
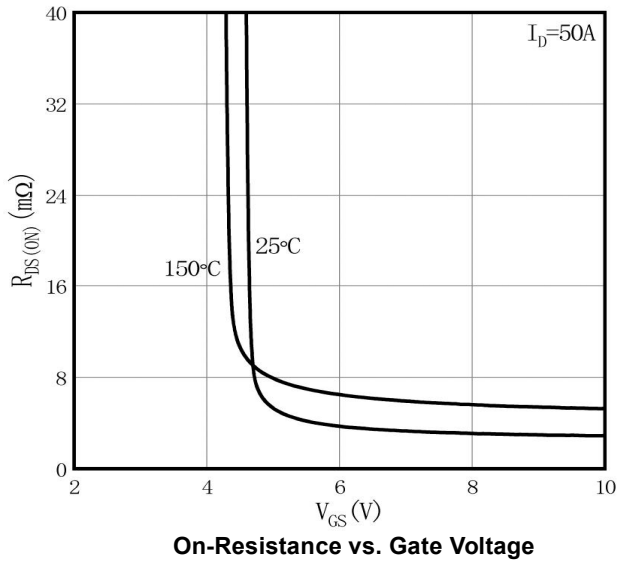
On-Resistance vs. Temperature

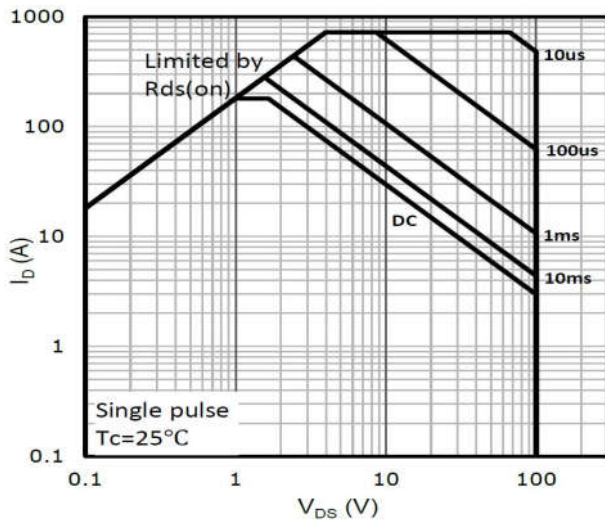


Breakdown Voltage vs. Temperature

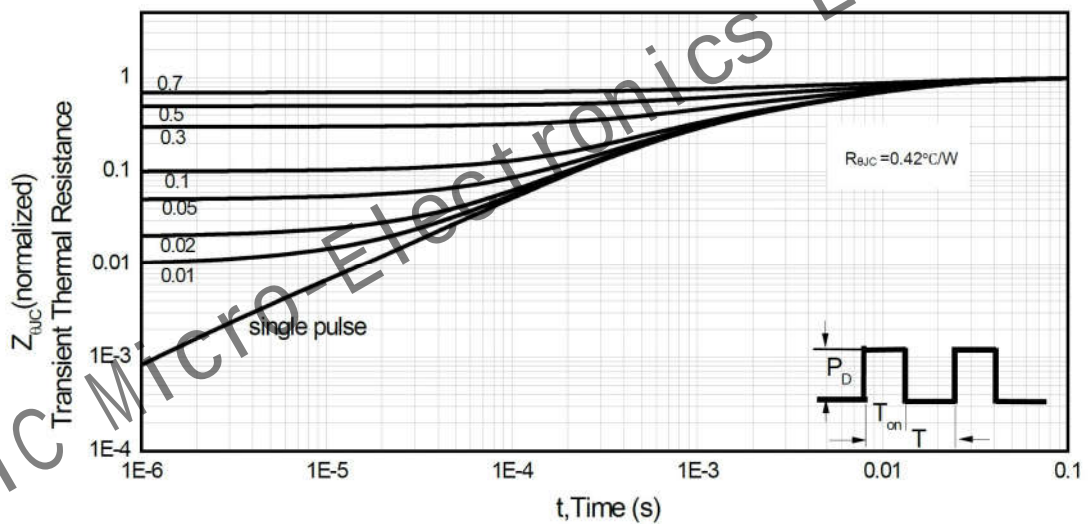


Threshold Voltage vs. Temperature





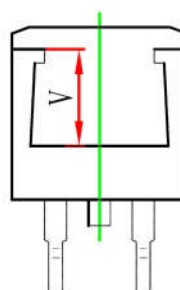
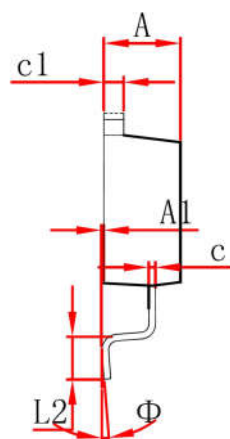
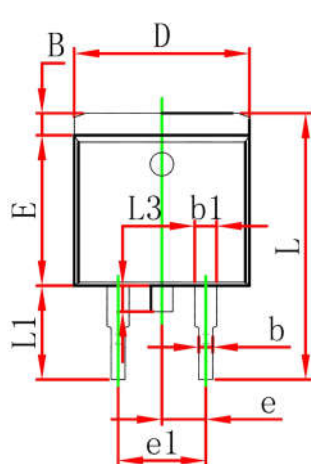
Maximum Safe Operating Area



Normalized Maximum Transient Thermal Impedance (R_{thJC})

Dimension

TO-263-2L



Symbol	Millimeters	
	Min	Max
A	4.470	4.670
A1	0.000	0.150
B	1.120	1.420
b	0.710	0.910
b1	1.170	1.370
c	0.310	0.530
c1	1.170	1.370
D	10.010	10.310
E	8.500	8.900
e	2.540 TYP.	
e1	4.980	5.180
L	14.940	15.500
L1	4.950	5.450
L2	2.340	2.740
L3	1.300	1.700
Φ	0°	8°
V	5.600 REF.	