

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	2.6m Ω @10V	120A

Features

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

Applications

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

40V N-Channel SGT Power MOSFET

TO-263-2L

PIN1:GATE
PIN2:DRAIN
PIN3:SOURCE

Schematic diagram

Marking

G023N04 : 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}	40	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C = 25^\circ\text{C}$	120
		$T_C = 100^\circ\text{C}$	74
Pulsed drain current	I_{DM}	480	A
Avalanche energy ¹	E_{AS}	144	mJ
Power Dissipation	P_D	128	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.98	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +150	$^\circ\text{C}$
Soldering temperature, wave soldering only allowed	T_{sold}	260	$^\circ\text{C}$

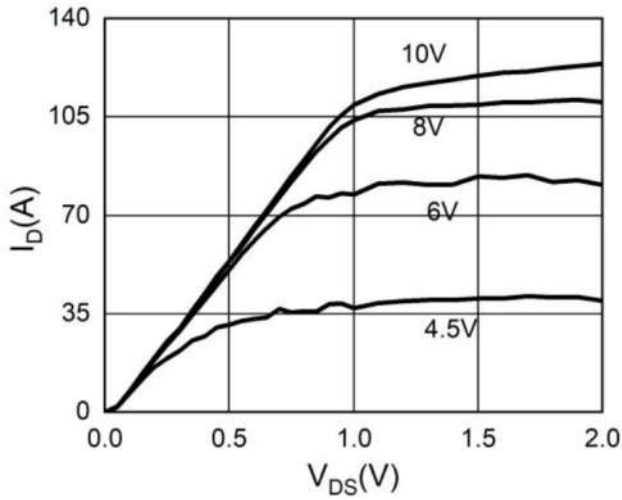
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40V, V _{GS} = 0V, T _J = 25°C			1	μA
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 = 20A, T _J = 25°C		2.6	3.5	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 20V, V _{GS} = 0V, f= 1MHz		2300		pF
Output Capacitance	C _{oss}			970		
Reverse Transfer Capacitance	C _{rss}			50		
Gate resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f= 1MHz		2.8		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 20V, I _D = 20A, V _{GS} = 10 V		130		nC
Gate-source Charge	Q _{gs}			10		
Gate-drain Charge	Q _{gd}			3.5		
Turn-on Delay Time	t _{d(on)}	V _{DD} = 20V, V _{GS} = 10V, I _D = 20A, R _g = 3Ω		11		ns
Turn-on Rise Time	t _r			4		
Turn-off Delay Time	t _{d(off)}			35		
Turn-off Fall Time	t _f			3		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 20A			1.2	V
Reverse Recovery Time	t _{rr}	I _F = 20A, dI/dt= 100A/μs		15		ns
Reverse Recovery Charge	Q _{rr}				42	

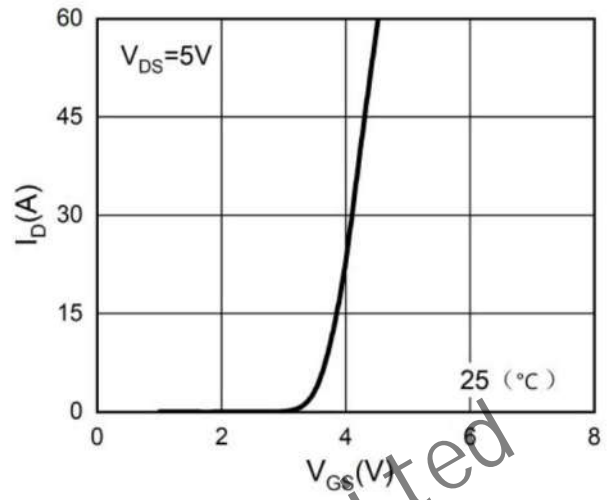
Notes :

1. E_{AS} condition: T_J=25°C, V_{DD}= 30V, V_G= 10V, R_g= 25 Ω, L= 0.5mH.

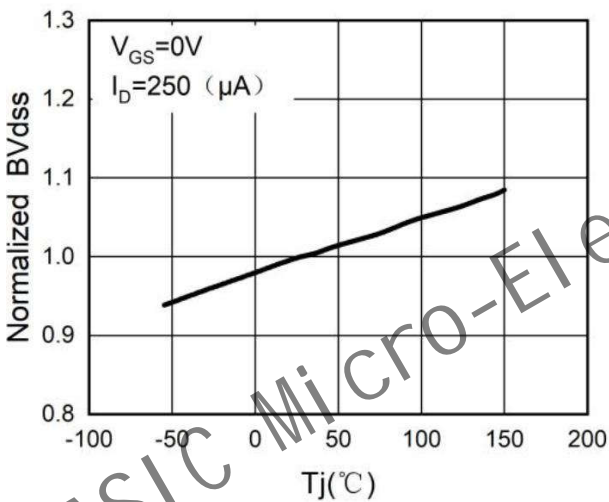
Typical Characteristic



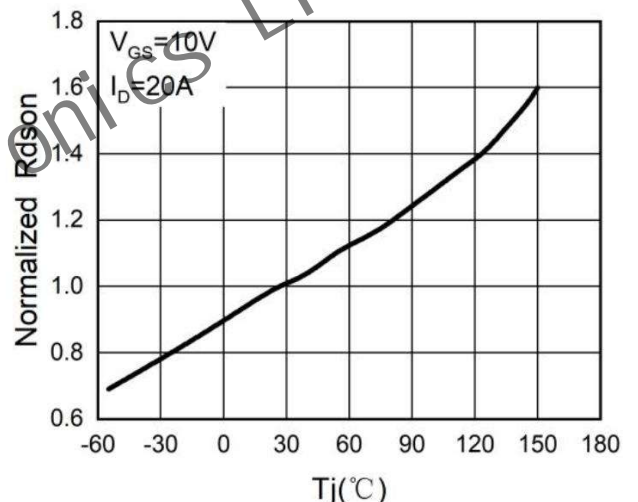
Output Characteristics



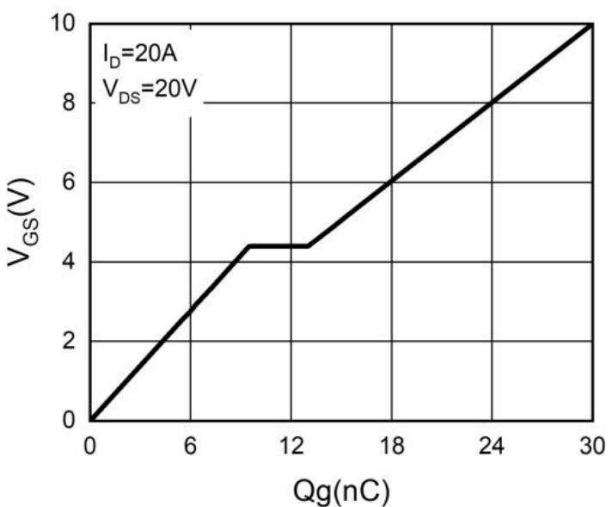
Transfer Characteristics



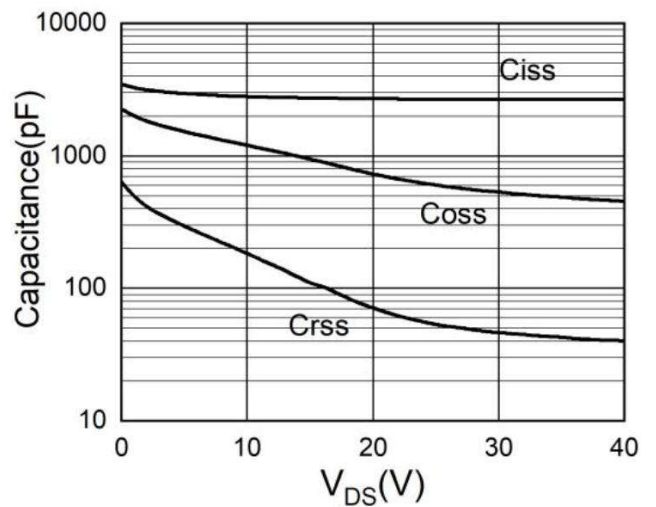
BV_{dss} vs Junction Temperature



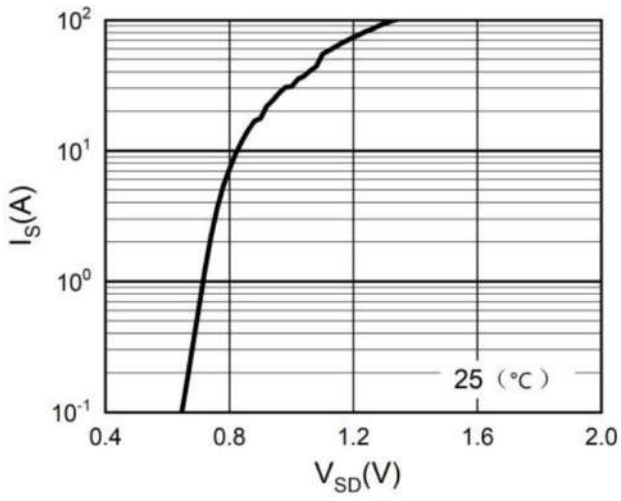
$R_{DS(on)}$ vs Junction Temperature



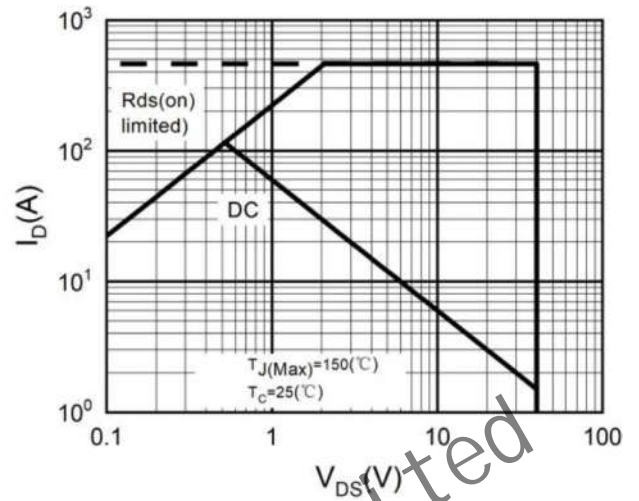
Gate Charge Characteristics



Capacitance Characteristics

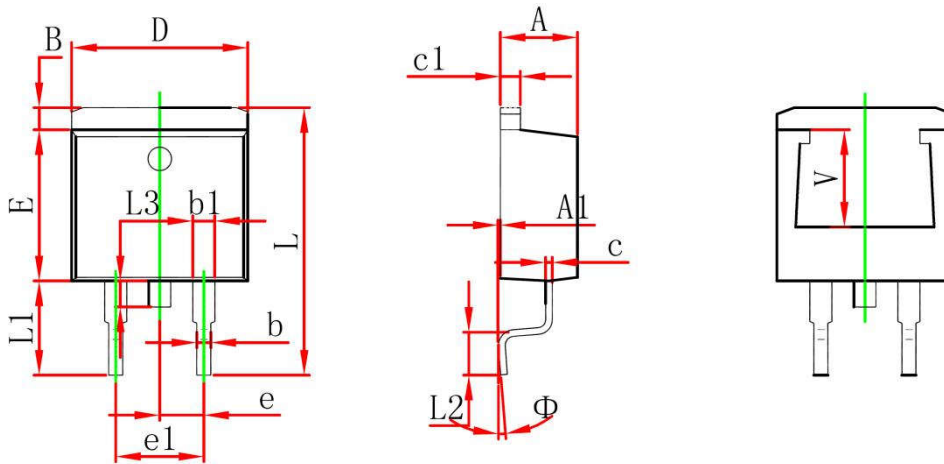


Body-Diode Characteristics



Maximum Safe Operating Area

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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.	

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