

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
100V	4.9m $\Omega$ @10V	125A
	6.4m $\Omega$ @4.5V	

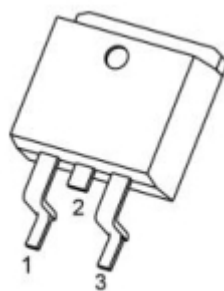
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

## Application

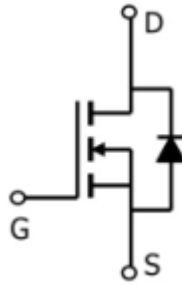
- Power switching application
- PWM Application
- DC-DC Converter

## Package



TO-263(1:G 2:D 3:S)

## Circuit diagram



## Marking



**010N04BG** =Device Code  
**\*\*** =Week Code

## Absolute maximum ratings

( $T_a=25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_C = 25^\circ\text{C}$ )	$I_D$	125	A
Pulsed Drain Current	$I_{DM}$	500	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	100	mJ
Avalanche Current	$I_{AS}$	20	A
Total Power Dissipation( $T_C = 25^\circ\text{C}$ )	$P_D$	185	W
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	0.67	$^\circ\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55~ +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55~ +150	$^\circ\text{C}$

## Electrical characteristics

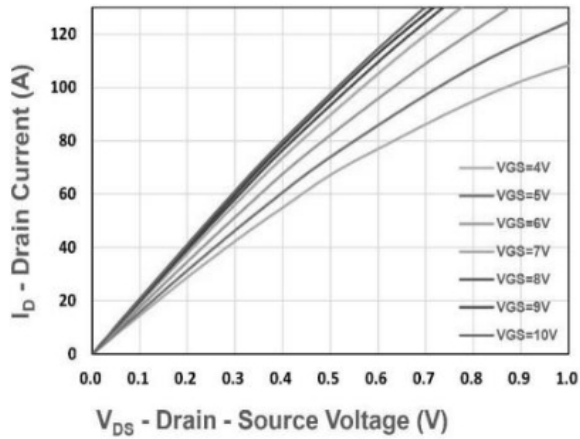
(T<sub>A</sub>=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	100			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> = 0V , T <sub>J</sub> =25°C			1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	uA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	2	3	V
Static Drain-Source on-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A		4.9	6.1	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		6.4	8.5	
Dynamic characteristics						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V,V <sub>GS</sub> =0V, f=1MHz		4850		pF
Output Capacitance	C <sub>oss</sub>			480		
Reverse Transfer Capacitance	C <sub>rss</sub>			34		
Switching Characteristics						
Total Gate Charge (4.5V)	Q <sub>g</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =50A		97		nC
Gate-Source Charge	Q <sub>gS</sub>			27		
Gate-Drain Charge	Q <sub>gd</sub>			30		
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>GS</sub> =50V, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω, I <sub>D</sub> =50A		24		nS
Rise Time	T <sub>r</sub>			13		
Turn-Off Delay Time	T <sub>d(off)</sub>			47		
Fall Time	T <sub>f</sub>			11		
Diode Characteristics						
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A , T <sub>J</sub> =25°C			1.2	V

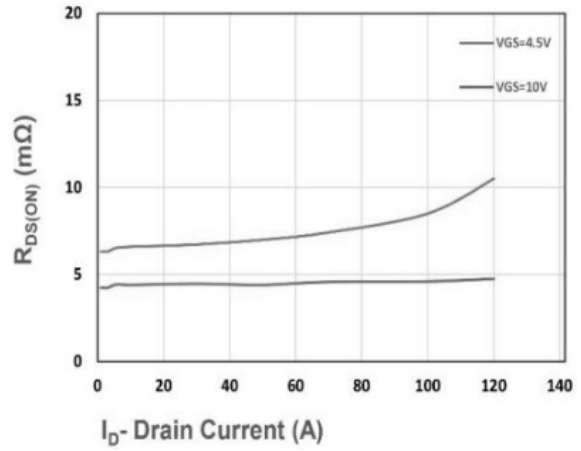
**Notes:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. The EAS data shows Max. rating. The test condition is V<sub>DD</sub> = 50V, V<sub>GS</sub> = 10V, L = 0.5mH, I<sub>AS</sub> = 20A
4. The power dissipation is limited by 150°C junction temperature

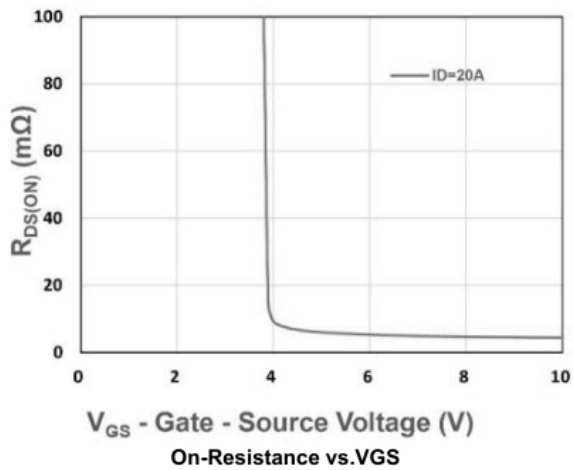
## Typical Characteristics



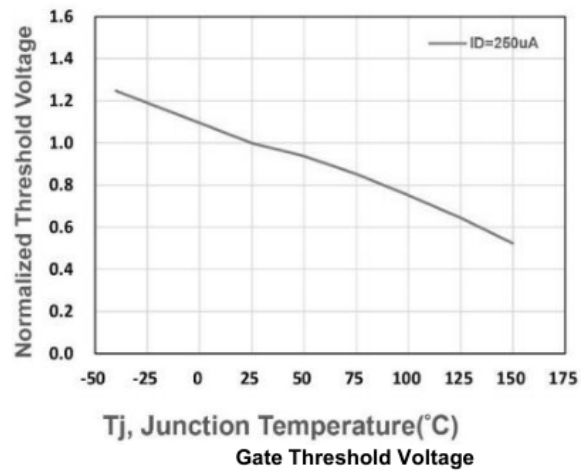
Typical Output Characteristics



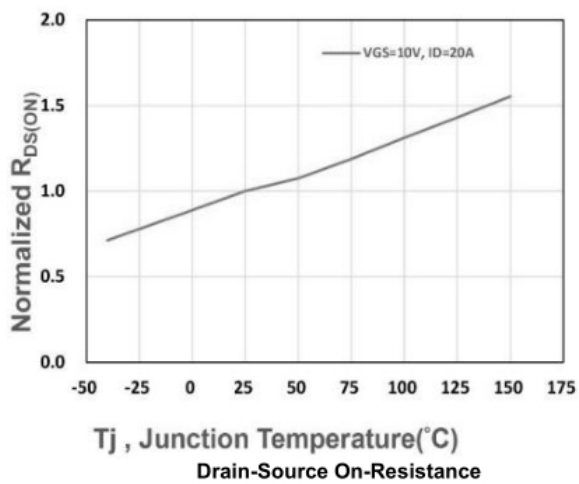
On-Resistance vs.  $I_D$



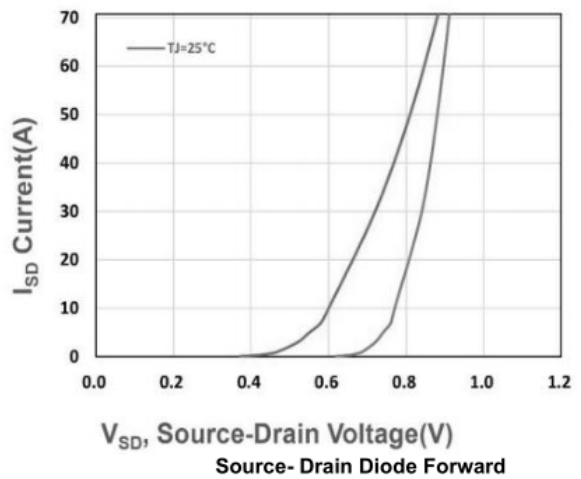
On-Resistance vs.  $V_{GS}$



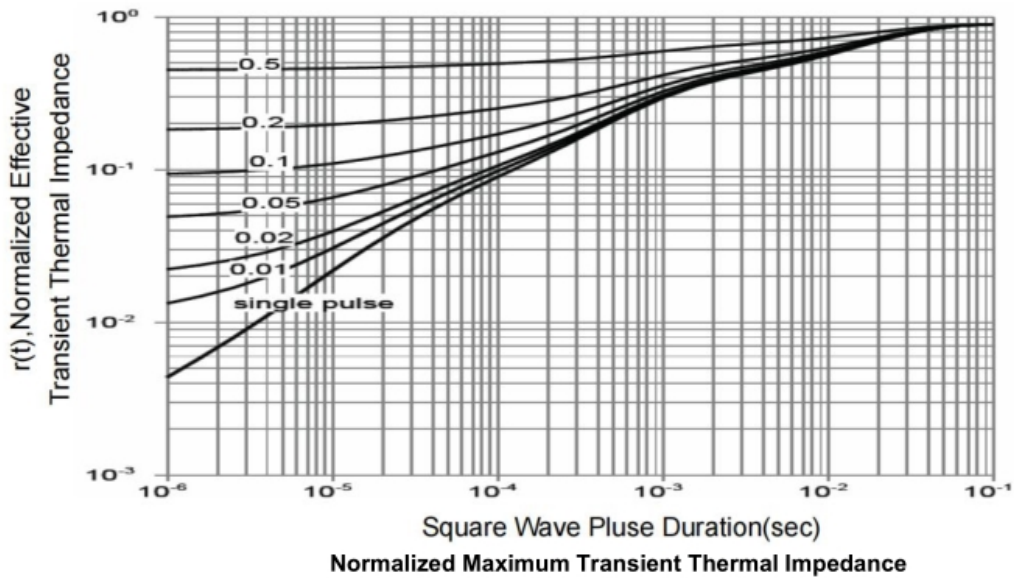
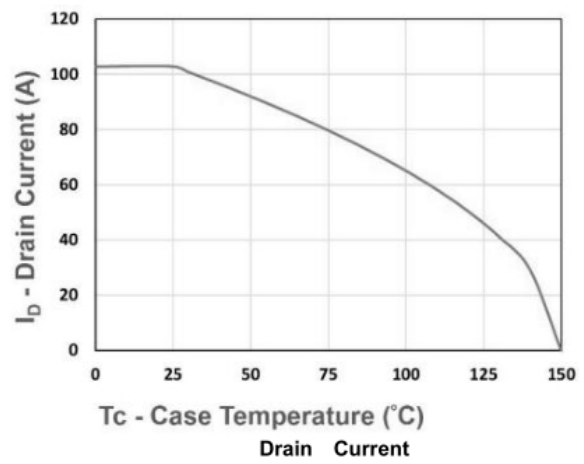
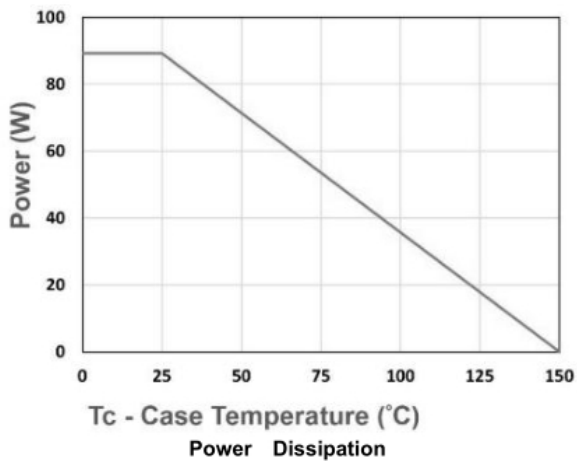
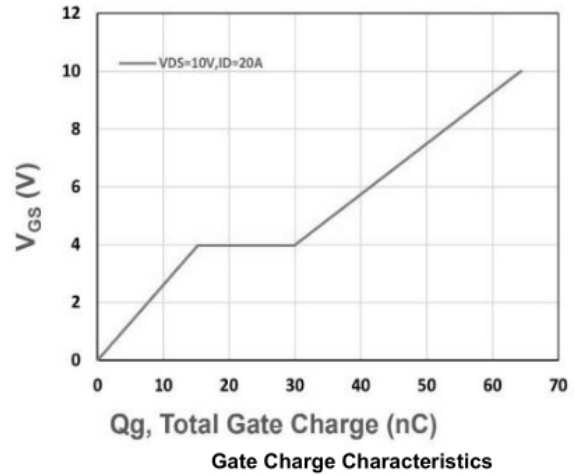
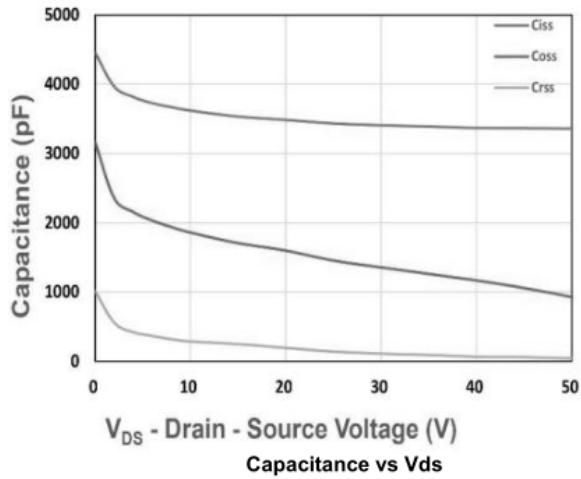
Gate Threshold Voltage



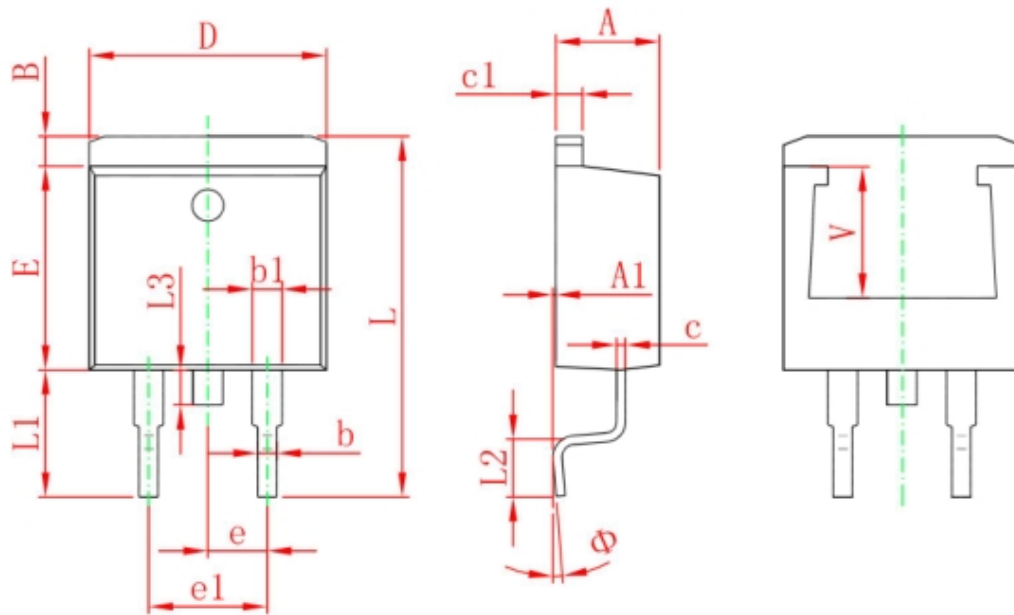
Drain-Source On-Resistance



Source- Drain Diode Forward



## TO-263 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	