

### Features

- 100V/170A  
RDS(ON)= 5mΩ (Max)@ VGS=10V
- Lead free and Green Device Available
- Low Rds-on to Minimize Conductive Loss
- High avalanche Current

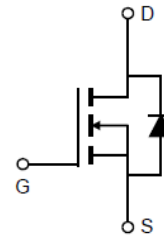
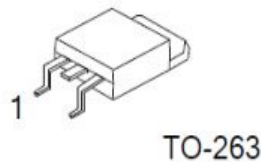
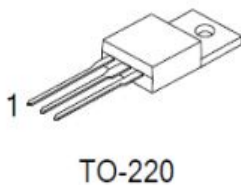
### Applications

- Power Supply
- DC-DC Converters

### Product Summary

$V_{DS}$	100	V
$R_{DS(on),TYP}@ V_{GS}=10V$	4.5	mΩ
$I_D$	150	A

Part ID	Package Type	Marking
SFP150N100A	TO-220	150N100A
SFB150N100A	TO-263	150N100A



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

Symbol	Parameter	Maximum	Unit
$V_{DSS}$	Drain-to-Source Voltage	100	V
$V_{GSS}$	Gate-to-Source Voltage	±25	V
$I_D^3$	Continuous Drain Current	$T_C=25^\circ\text{C}$	150
		$T_C=100^\circ\text{C}$	120
$I_{DP}^4$	Pulsed Drain Current	$T_C=25^\circ\text{C}$	600
$I_{AS}^5$	Avalanche Current	40	A
$EAS^5$	Avalanche energy	700	mJ
PD	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	240
		$T_C=100^\circ\text{C}$	125
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55~175	°C

### Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta jc}$	Thermal Resistance-Junction to Case	0.6	°C/W
$R_{\theta ja}$	Thermal Resistance-Junction to Ambient	62.5	

**Electrical Characteristics** (TA=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	—	—	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$	—	—	1	uA
		$T_J=125^\circ C$	—	—	100	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$	—	—	$\pm 100$	nA
$R_{DS(on)}^1$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=40A$	—	4.5	5	mΩ
			—	—	—	
<b>Diode Characteristics</b>						
$V_{SD}^1$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$	—	0.8	1.3	V
$I_S^3$	Diode Continuous Forward Current		—	—	180	A
$t_{rr}$	Reverse Recovery Time	$I_F=40A,$	—	65	—	nS
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu s$	—	103	—	nC
<b>Dynamic Characteristics<sup>2</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ Frequency=1MHz	—	2.5	—	Ω
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=25V$ Frequency=1MHz	—	7850	—	pF
$C_{oss}$	Output Capacitance		—	1010	—	
$C_{riss}$	Reverse Transfer Capacitance		—	630	—	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=37.5V, I_D=40A,$ $V_{GS}=10V, R_G=6.8\Omega$	—	28	—	nS
$t_r$	Rise Time		—	45	—	
$t_{d(off)}$	Turn-Off Delay Time		—	84	—	
$t_f$	Fall Time		—	49	—	
<b>Gate Charge Characteristics<sup>2</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=37.5V, V_{GS}=10V$ $I_D=40A$	—	184	—	nC
$Q_{gs}$	Gate-to-Source Charge		—	33	—	
$Q_{gd}$	Gate-to-Drain Charge		—	60	—	

Note: 1: Pulse test; pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

2: Guaranteed by design, not subject to production testing.

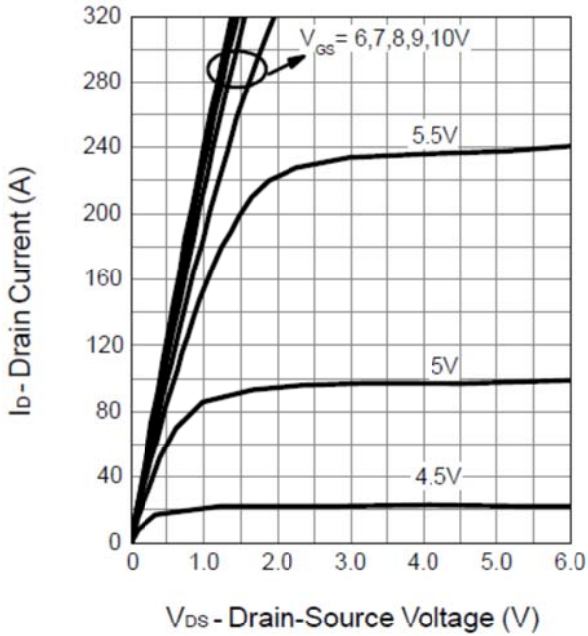
3: Calculated continuous current based on maximum allowable junction temperature.

4: Repetitive rating, pulse width limited by max junction temperature.

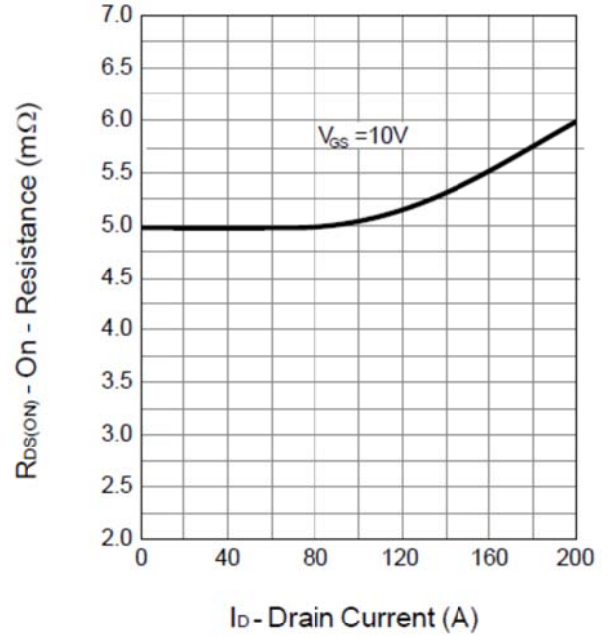
5: Starting  $T_J = 25^\circ C, L = 0.5mH, V_{DD}=80V, I_{AS} = 74A$ .

## Typical Operating Characteristics

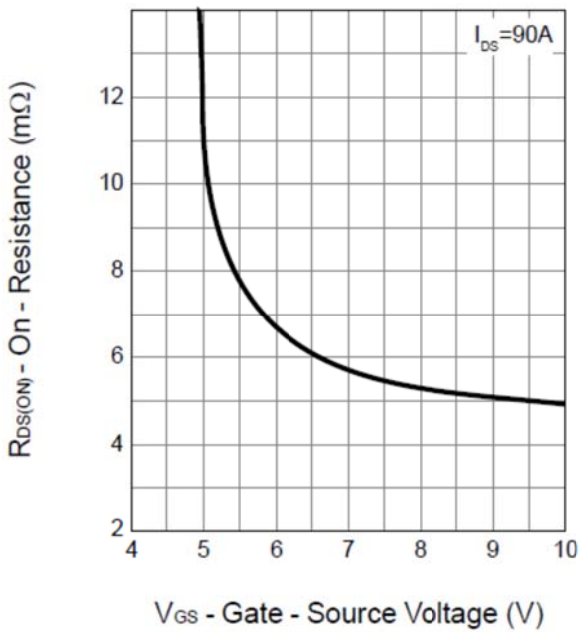
Output Characteristics



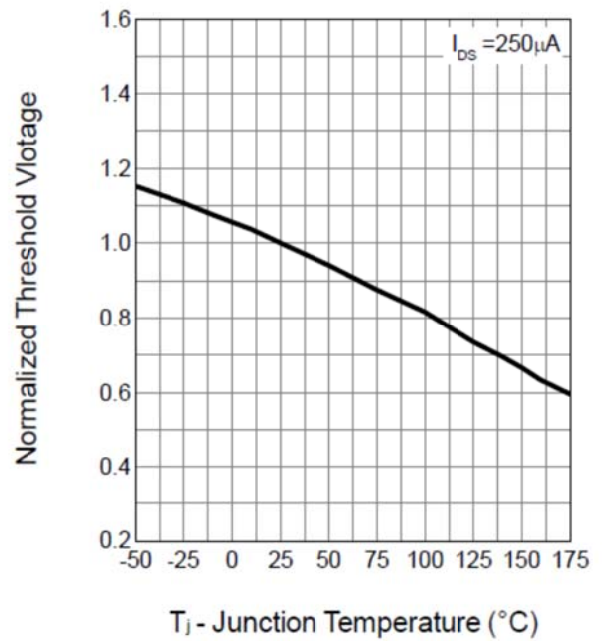
Drain-Source On Resistance



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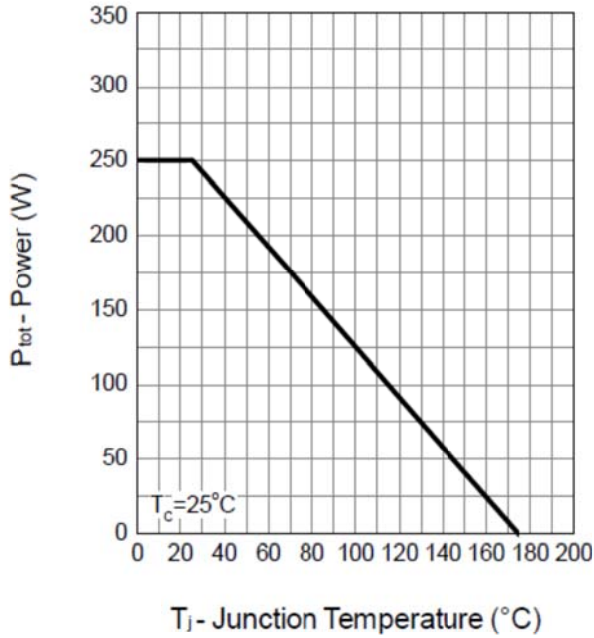


Gate Threshold Voltage

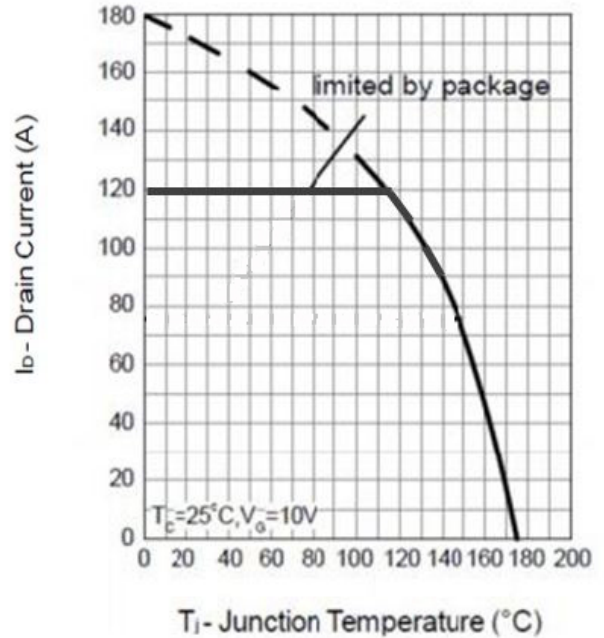


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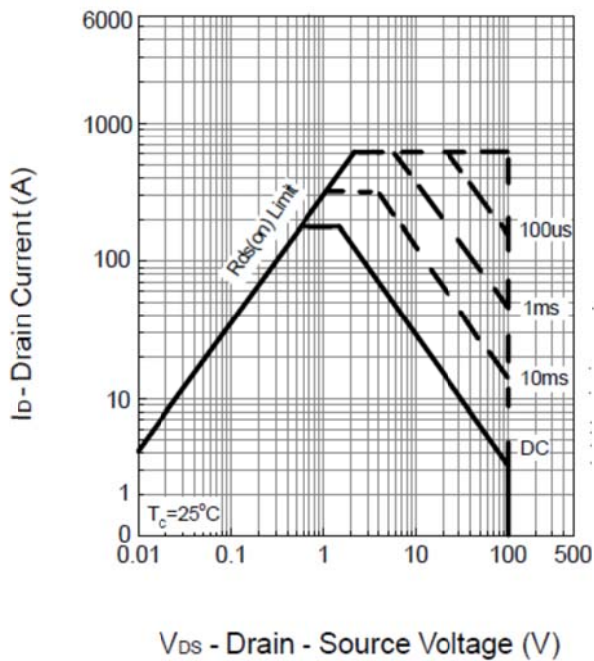
Power Dissipation



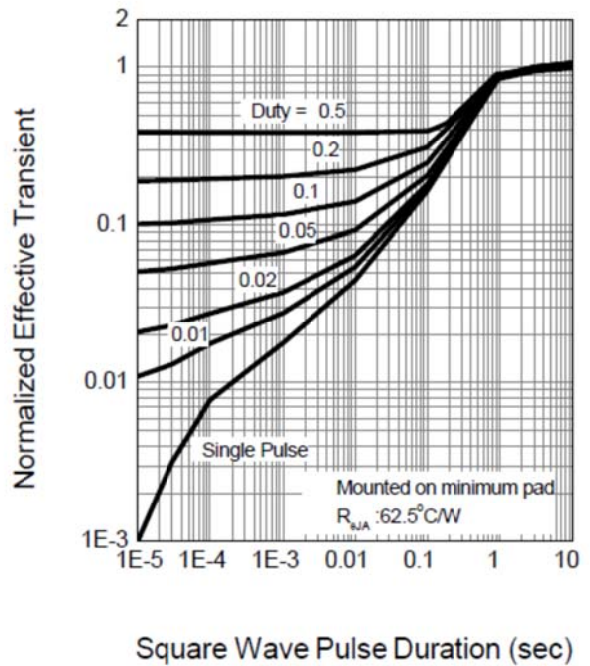
Drain Current



Safe Operation Area

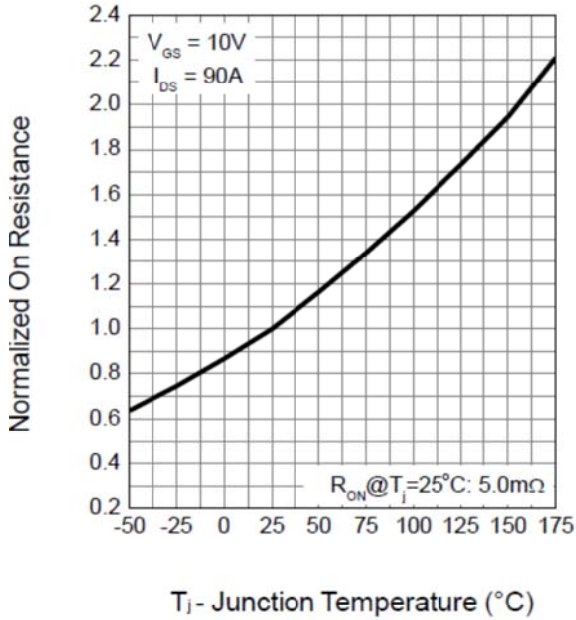


Thermal Transient Impedance

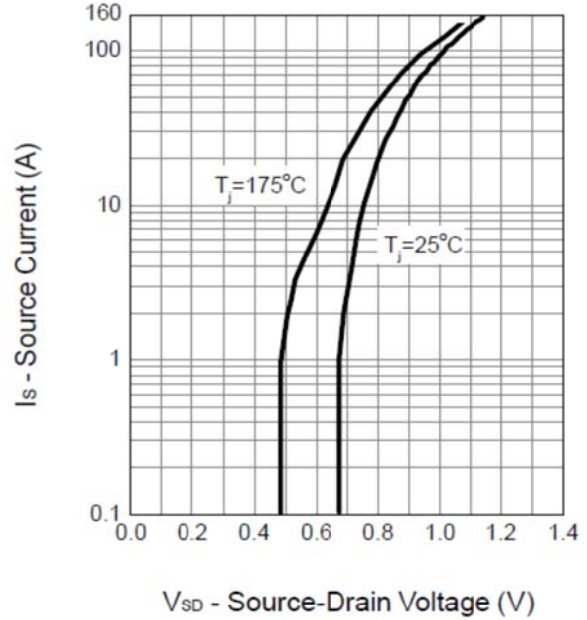


## Typical Operating Characteristics

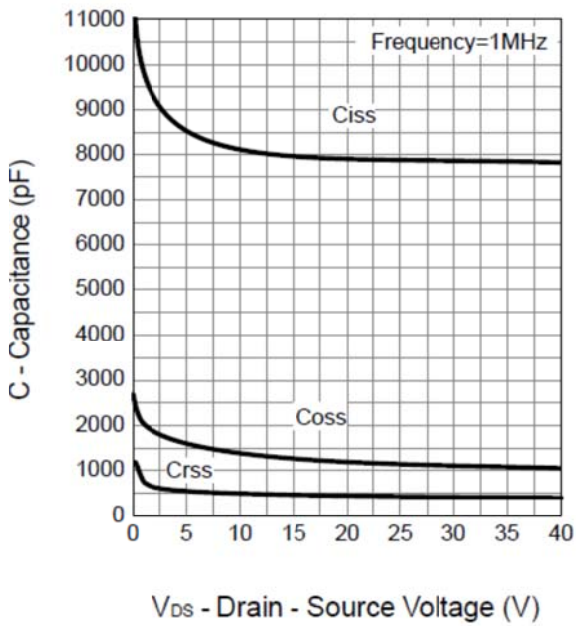
**Drain-Source On Resistance**



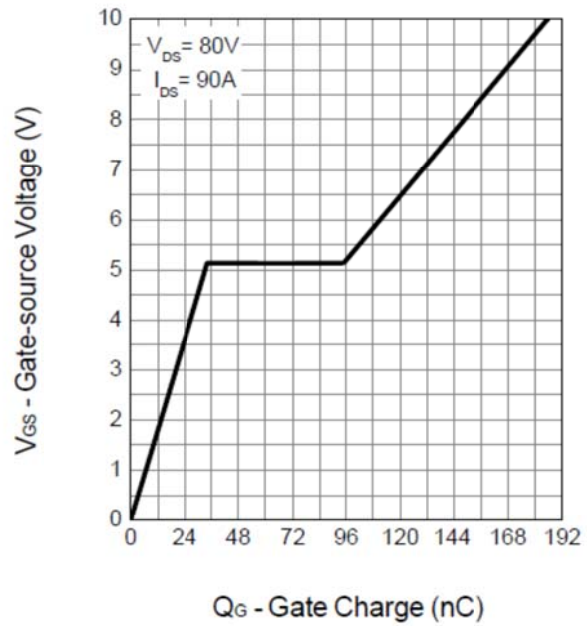
**Source-Drain Diode Forward**

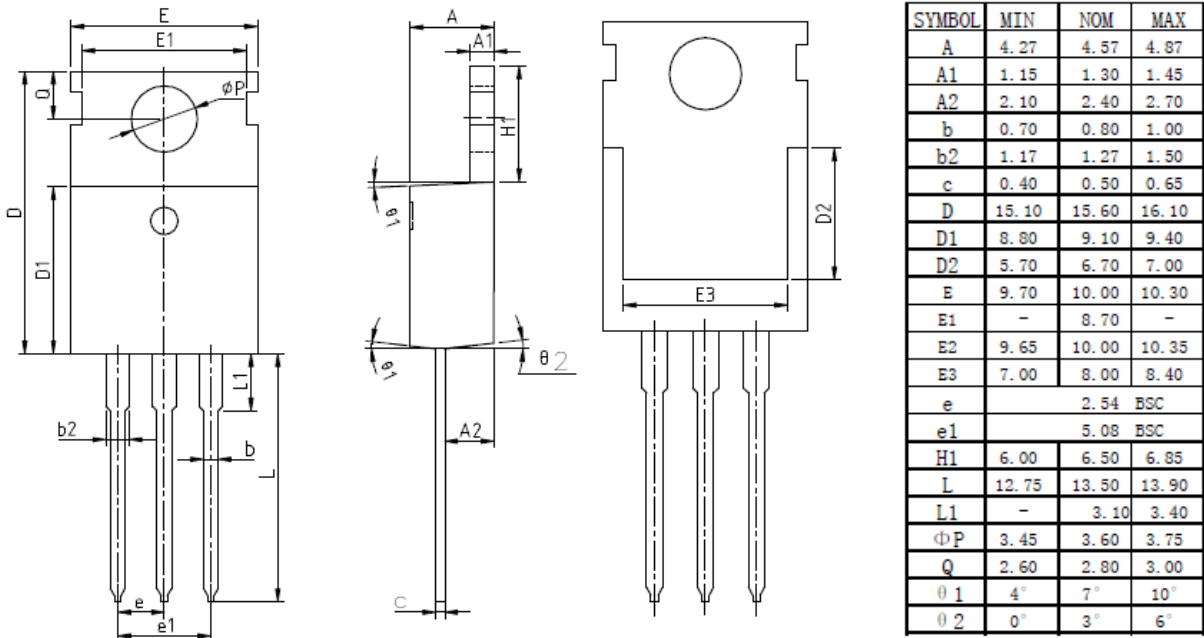


**Capacitance**



**Gate Charge**



**PACKAGE DIMENSION**
**TO-220**

**TO-263**
