

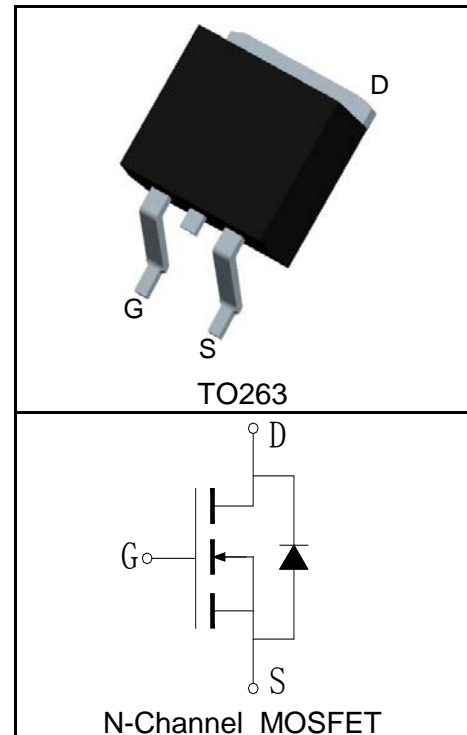
### Features

- 60V/120A,  
RDS<sub>(ON)</sub> = 6m(Typ.) @V<sub>GS</sub> = 10V
- Ultra Low On-Resistance
- Exceptional dv/dt capability
- Fast Switching and Fully Avalanche Rated
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free and Green Available

### Applications

- Switching Application Systems
- Inverter Systems

### Pin Description



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> (T <sub>C</sub> = 25°C Unless Otherwise Noted)			
V <sub>DSS</sub>	Drain-Source Voltage	60	V
V <sub>GSS</sub>	Gate-Source Voltage	±25	
T <sub>J</sub>	Maximum Junction Temperature	175	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 175	°C
I <sub>S</sub>	Diode Continuous Forward Current	T <sub>C</sub> = 25°C 120	A
<b>Mounted on Large Heat Sink</b>			
I <sub>DP</sub> <sup>①</sup>	300µs Pulse Drain Current Tested	T <sub>C</sub> = 25°C 380	A
I <sub>D</sub> <sup>②</sup>	Continuous Drain Current (V <sub>GS</sub> = 10V)	T <sub>C</sub> = 25°C 120	A
		T <sub>C</sub> = 100°C 90	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>C</sub> = 25°C 150	W
		T <sub>C</sub> = 100°C 75	
R <sub>θJC</sub>	Thermal Resistance-Junction to Case	1	°C/W
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	62.5	°C/W
<b>Drain-Source Avalanche Ratings</b>			
E <sub>AS</sub> <sup>③</sup>	Avalanche Energy, Single Pulsed	625	mJ

**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  Unless Otherwise Noted)

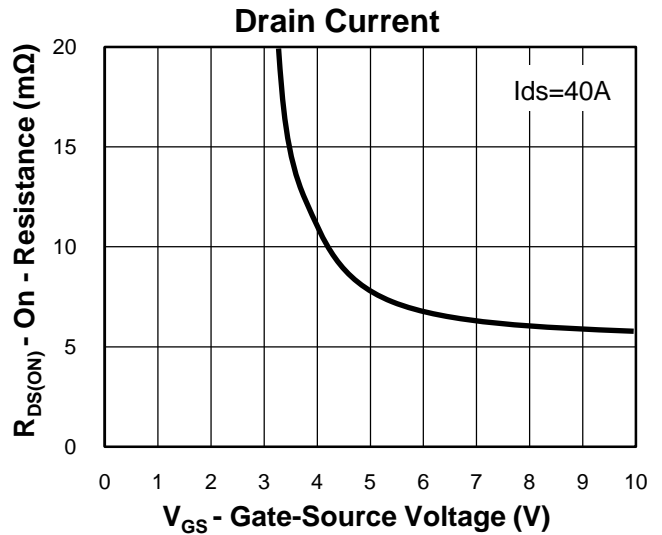
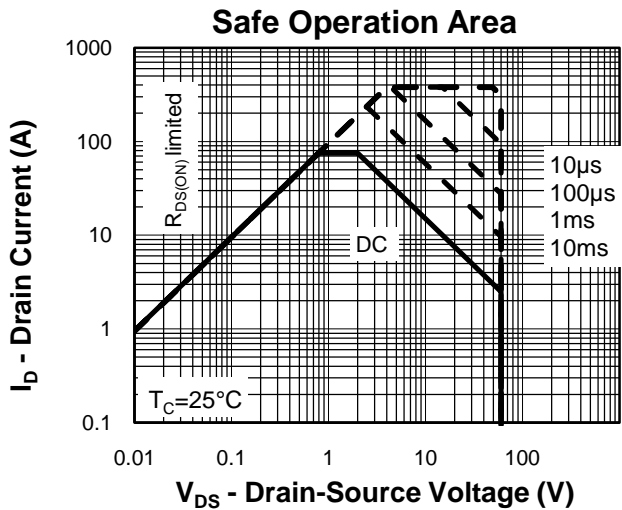
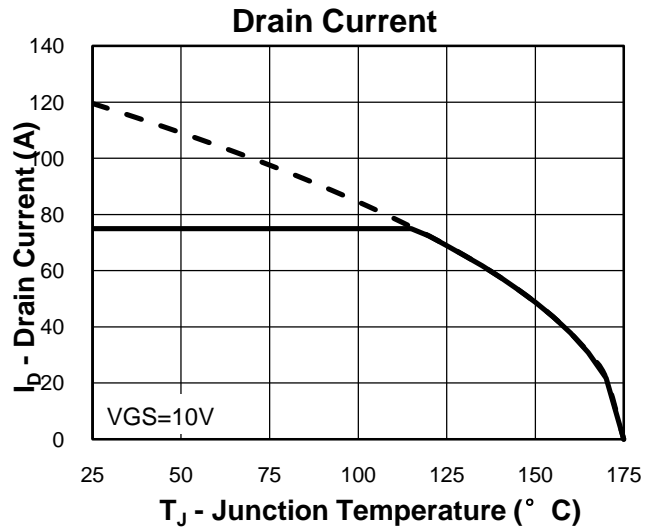
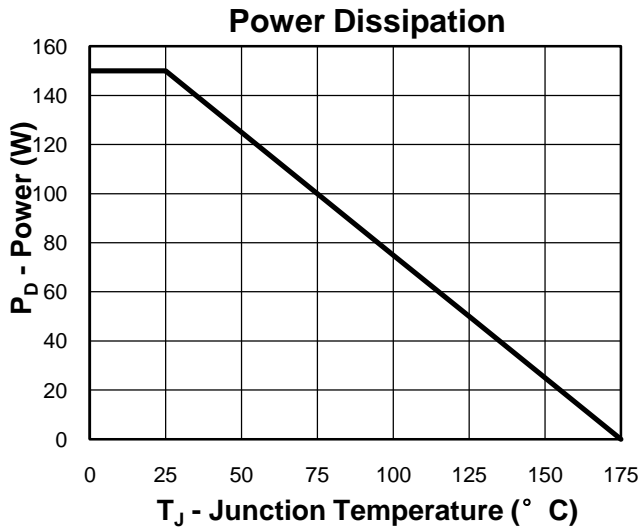
Symbol	Parameter	Test Condition	RU6099S			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	60			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=40A$		6	7	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=40A, di_{SD}/dt=100A/\mu s$		50		ns
$Q_{rr}$	Reverse Recovery Charge			95		nC
<b>Dynamic Characteristics</b> <sup>(5)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.3		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz		3000		pF
$C_{oss}$	Output Capacitance			430		
$C_{riss}$	Reverse Transfer Capacitance			240		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=30V, R_L=30\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=8\Omega$		14		ns
$t_r$	Turn-on Rise Time			17		
$t_{d(OFF)}$	Turn-off Delay Time			40		
$t_f$	Turn-off Fall Time			62		
<b>Gate Charge Characteristics</b> <sup>(5)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=30V, V_{GS}=10V,$ $I_{DS}=40A$		72		nC
$Q_{gs}$	Gate-Source Charge			13		
$Q_{gd}$	Gate-Drain Charge			24		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.
  - ③ Limited by  $T_{Jmax}$ ,  $I_{AS}=27A$ ,  $V_{DD}=48V$ ,  $R_G=50\Omega$ , Starting  $T_J=25^\circ\text{C}$ .
  - ④ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑤ Guaranteed by design, not subject to production testing.

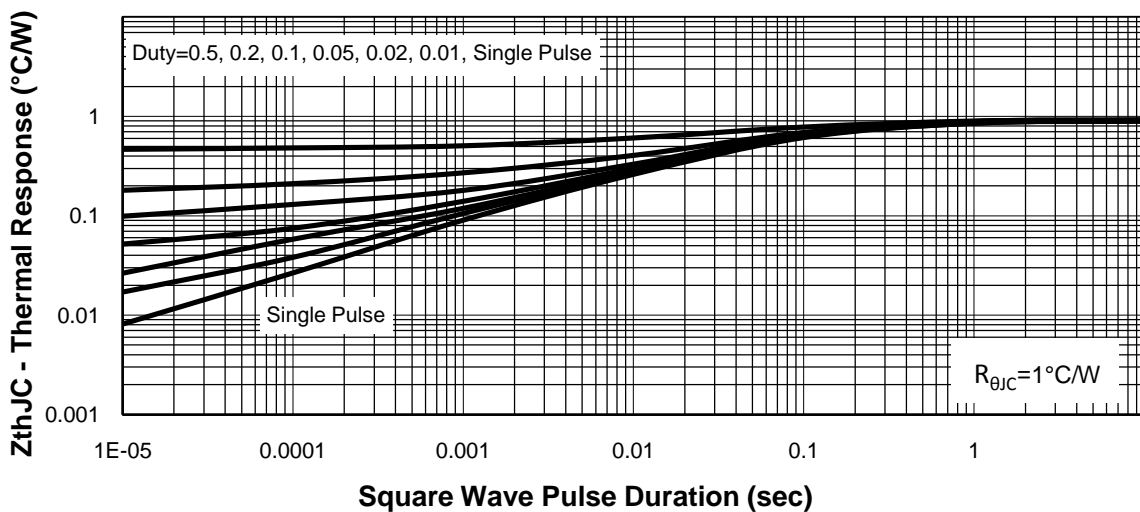
**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU6099S	RU6099S	TO263	Tube	50	-	-

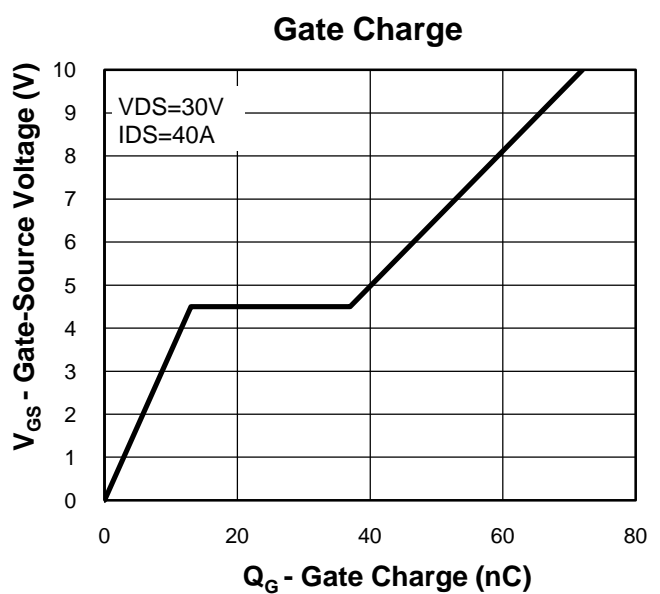
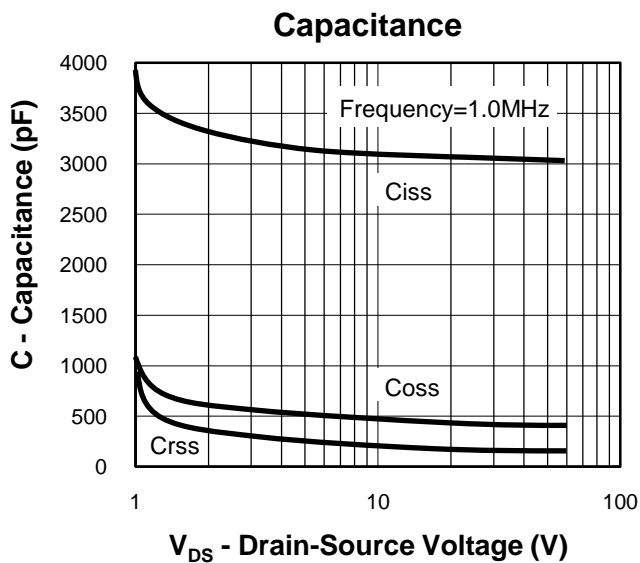
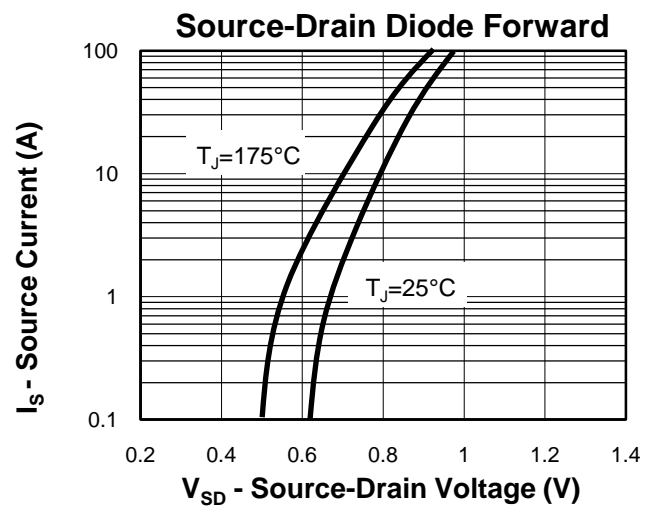
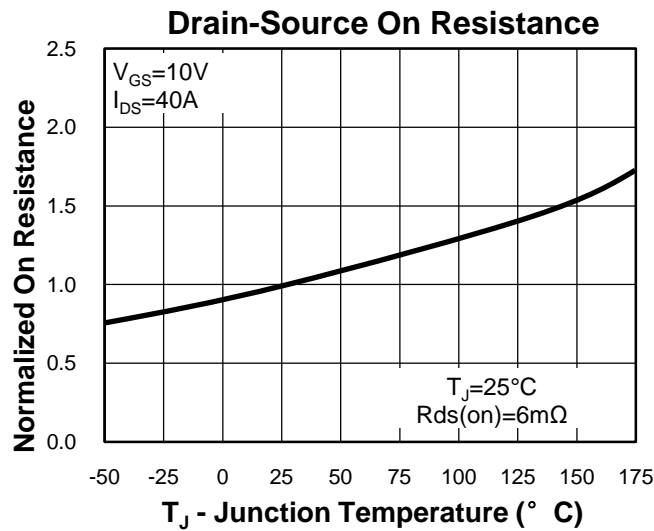
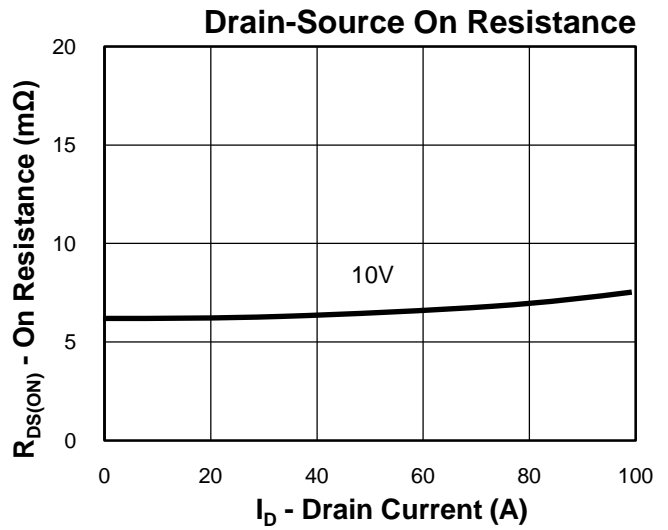
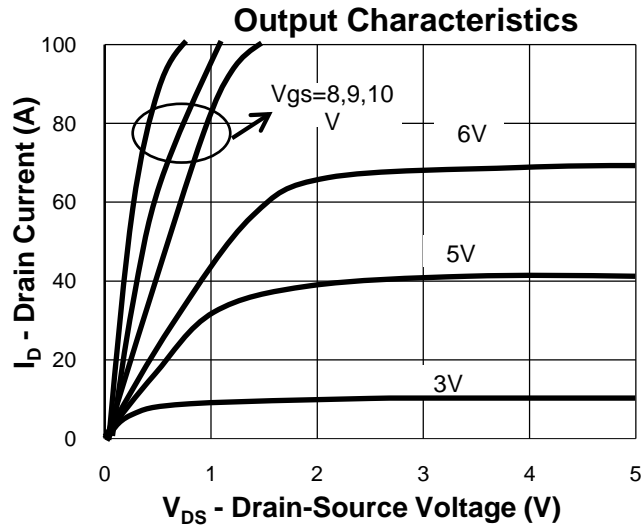
**Typical Characteristics**



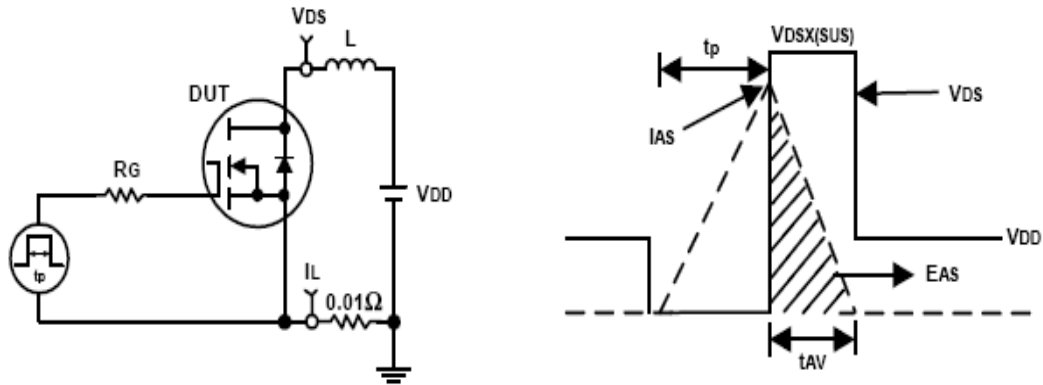
**Thermal Transient Impedance**



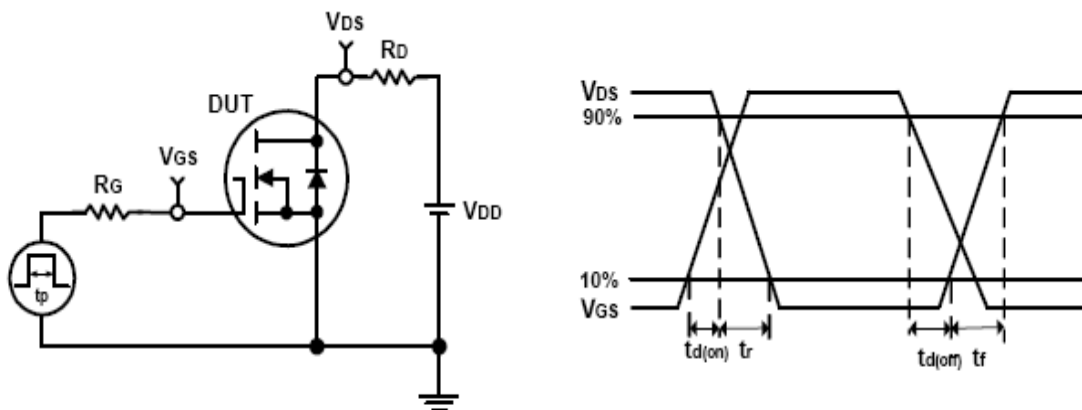
**Typical Characteristics**



**Avalanche Test Circuit and Waveforms**



**Switching Time Test Circuit and Waveforms**





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