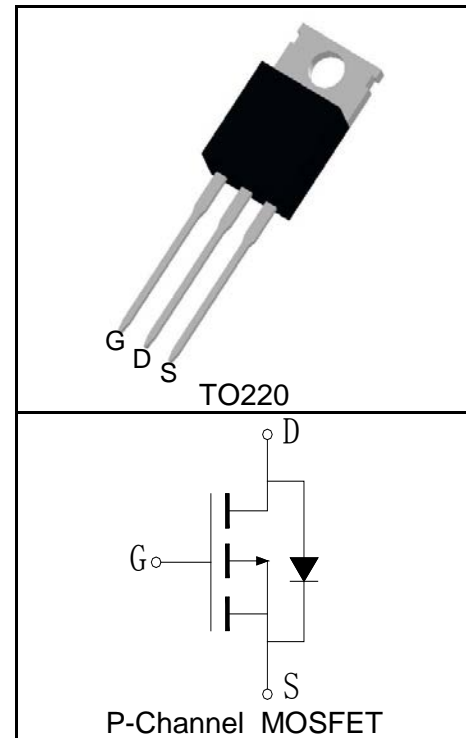


### Features

- -100V/-60A,  
 $R_{DS(ON)} = 18m\Omega(Typ.)@V_{GS}=-10V$
- Low On-Resistance
- Super High Dense Cell Design
- Fast Switching and Fully Avalanche Rated
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free and Green Devices Available (RoHS Compliant)

### Pin Description



### Applications

- Inverters

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_C=25^\circ C$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	-100	V
$V_{GSS}$	Gate-Source Voltage	$\pm 25$	
$T_J$	Maximum Junction Temperature	175	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ C$ -60	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu s$ Pulse Drain Current Tested	$T_C=25^\circ C$ -240	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=-10V$ )	$T_C=25^\circ C$ -60	A
		$T_C=100^\circ C$ -42	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ C$ 188	W
		$T_C=100^\circ C$ 94	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.8	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ C/W$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{③}$	Avalanche Energy, Single Pulsed	400	mJ

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

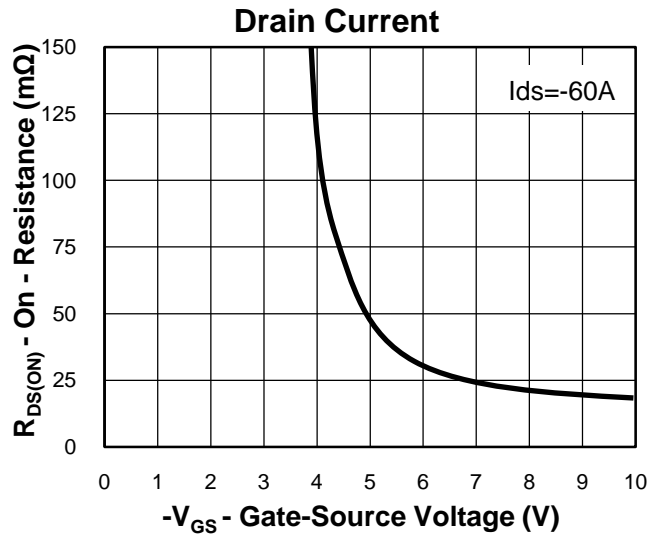
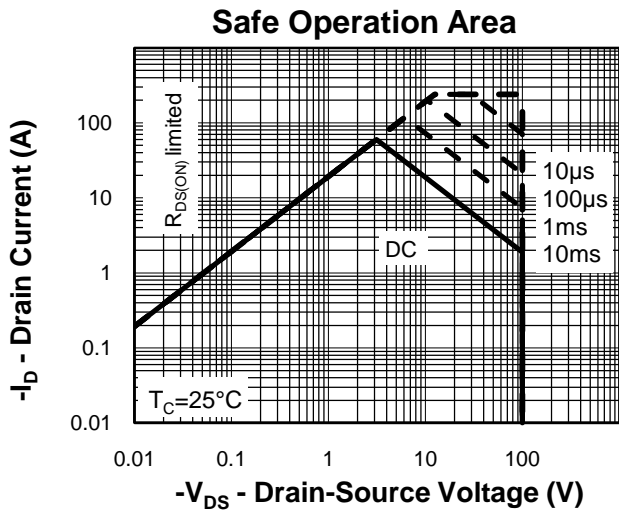
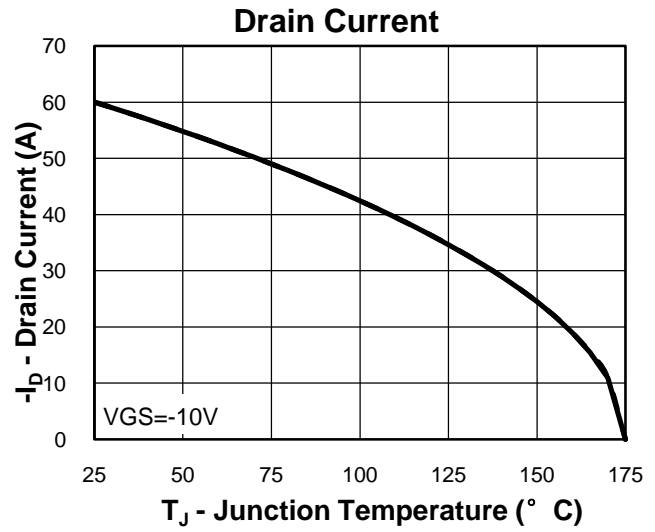
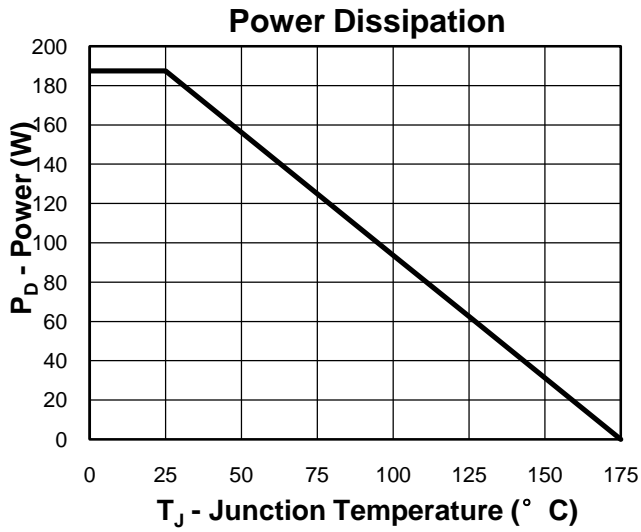
Symbol	Parameter	Test Condition	RU1HP60R			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-100			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-100V, V_{GS}=0V$			-1	$\mu A$
		$T_J=125^\circ C$			-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-2		-4	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_{DS}=-60A$		18	25	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=-30A, V_{GS}=0V$			-1.5	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=-60A, di_{SD}/dt=100A/\mu s$		175		ns
$Q_{rr}$	Reverse Recovery Charge			620		nC
<b>Dynamic Characteristics<sup>(5)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		2		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-50V,$ Frequency=1.0MHz		4200		pF
$C_{oss}$	Output Capacitance			615		
$C_{riss}$	Reverse Transfer Capacitance			380		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-50V, I_{DS}=-60A,$ $V_{GEN}=-10V, R_G=6\Omega$		27		ns
$t_r$	Turn-on Rise Time			83		
$t_{d(OFF)}$	Turn-off Delay Time			145		
$t_f$	Turn-off Fall Time			40		
<b>Gate Charge Characteristics<sup>(5)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=-80V, V_{GS}=-10V,$ $I_{DS}=-60A$		164		nC
$Q_{gs}$	Gate-Source Charge			34		
$Q_{gd}$	Gate-Drain Charge			50		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature.
  - ③ Limited by  $T_{Jmax}$ ,  $I_{AS}=-40A$ ,  $V_{DD}=-60V$ ,  $R_G=50\Omega$ , Starting  $T_J=25^\circ C$ .
  - ④ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑤ Guaranteed by design, not subject to production testing.

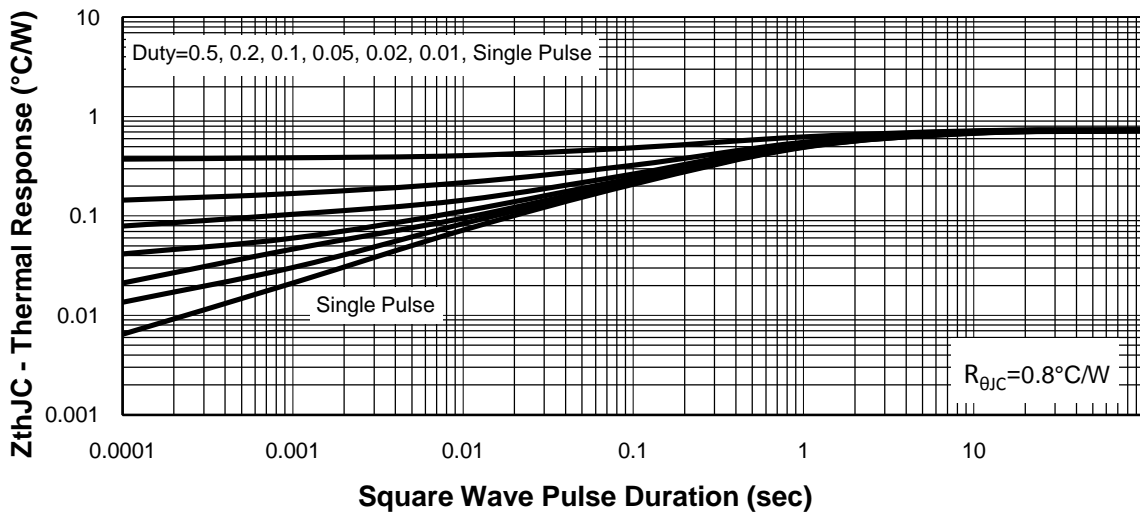
**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU1HP60R	RU1HP60R	TO220	Tube	50	-	-

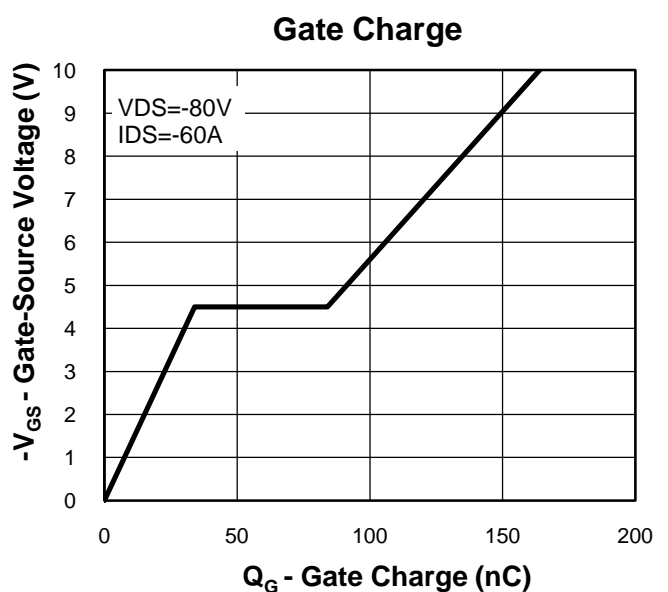
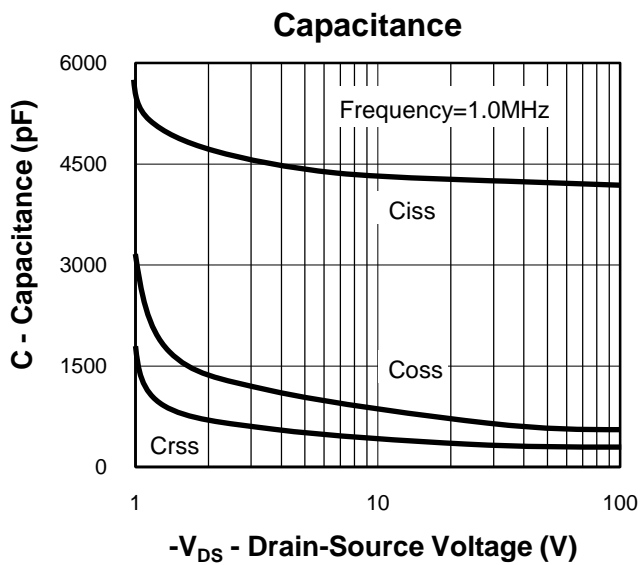
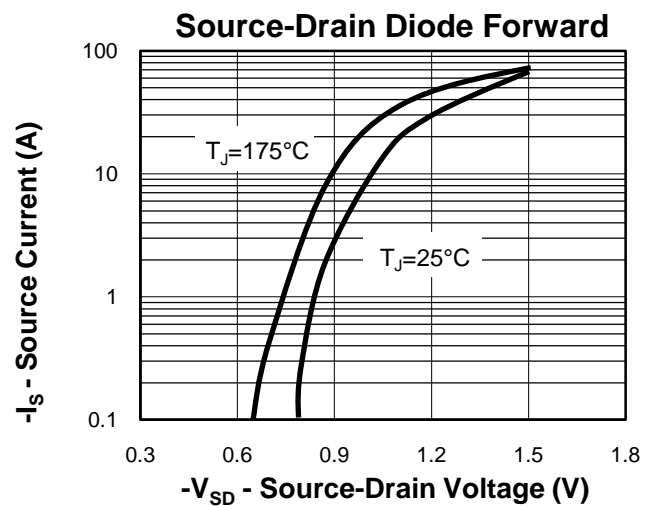
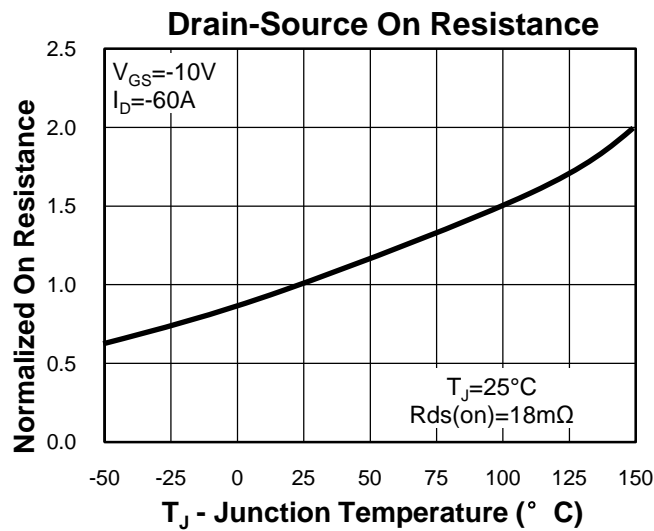
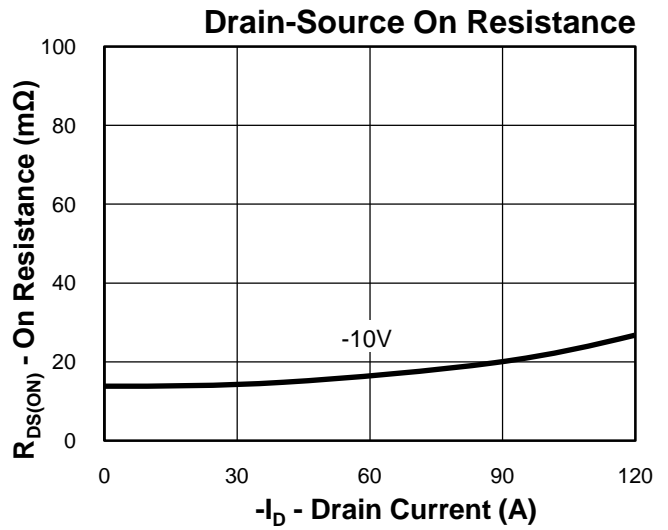
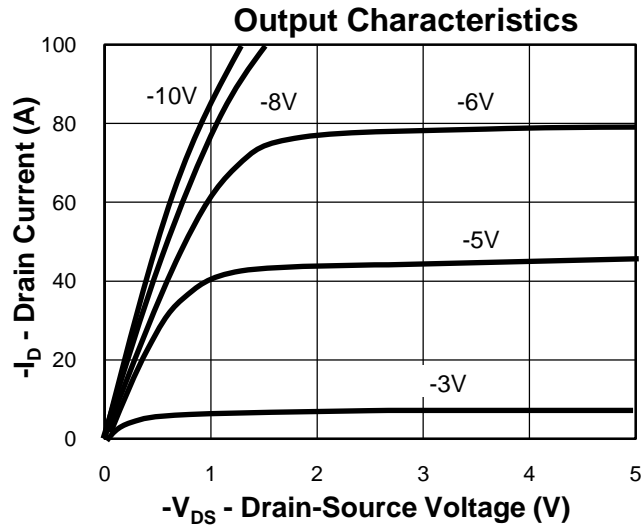
**Typical Characteristics**



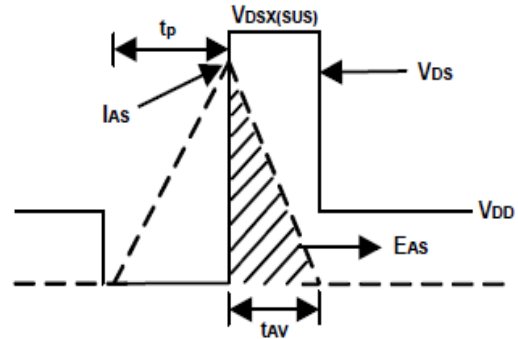
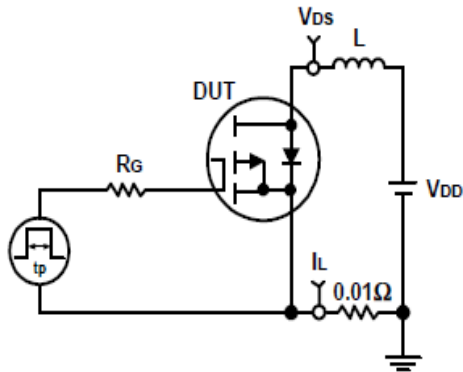
**Thermal Transient Impedance**



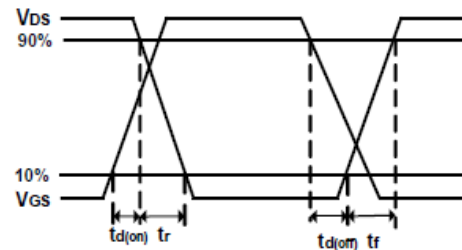
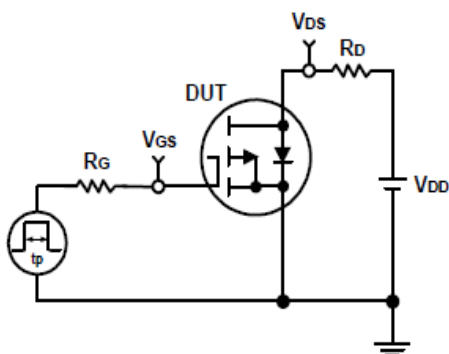
**Typical Characteristics**



**Avalanche Test Circuit and Waveforms**



**Switching Time Test Circuit and Waveforms**





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