

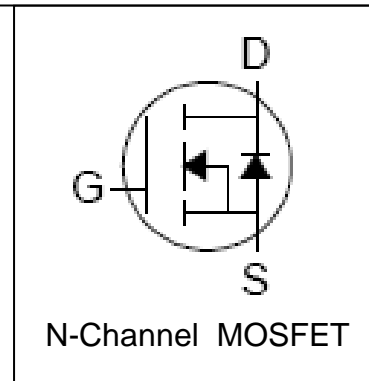
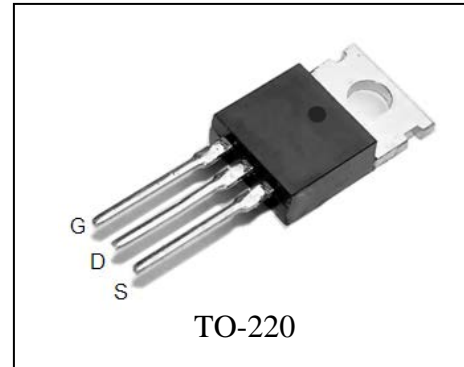
### Features

- 100V/80A  
 $R_{DS(ON)}=10m\Omega(Typ.) @ V_{GS}=10V$
- Ultra Low On-Resistance
- Exceptional dv/dt capability
- Fast Switching and Fully Avalanche Rated
- 100% avalanche tested
- Lead Free and Green Available

### Applications

- Switching Application Systems

### Pin Description



### Absolute Maximum Ratings

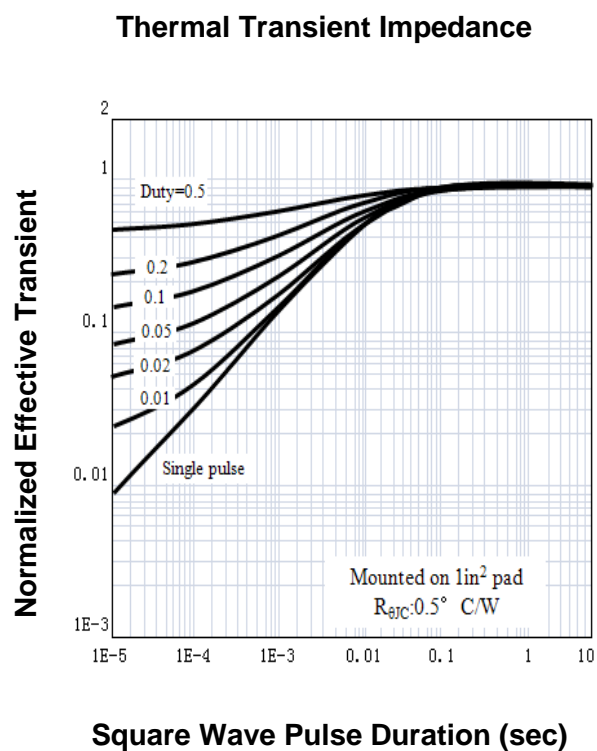
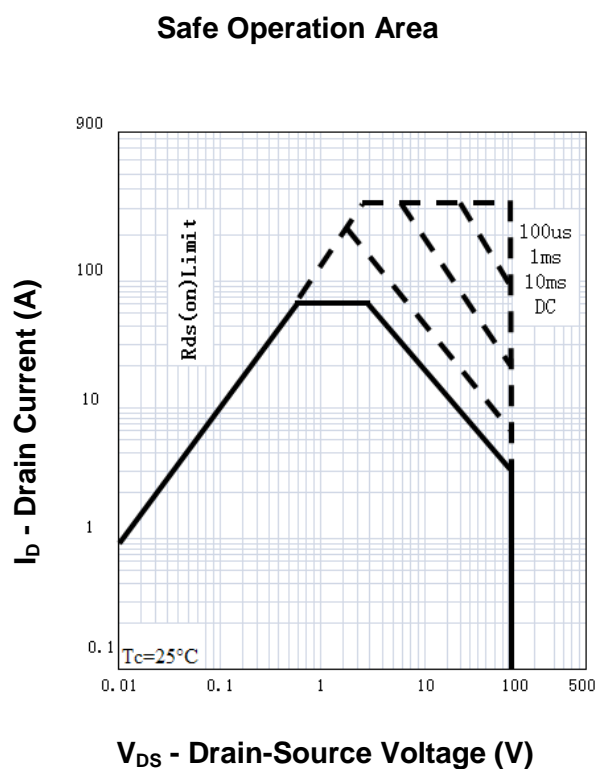
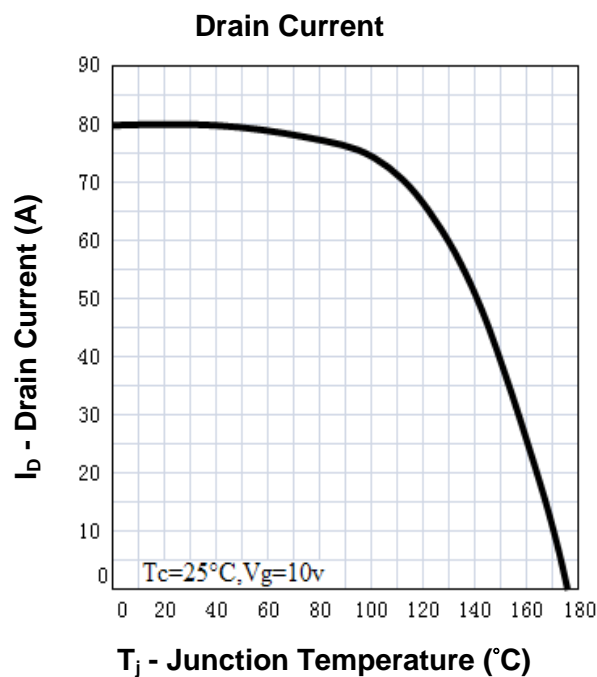
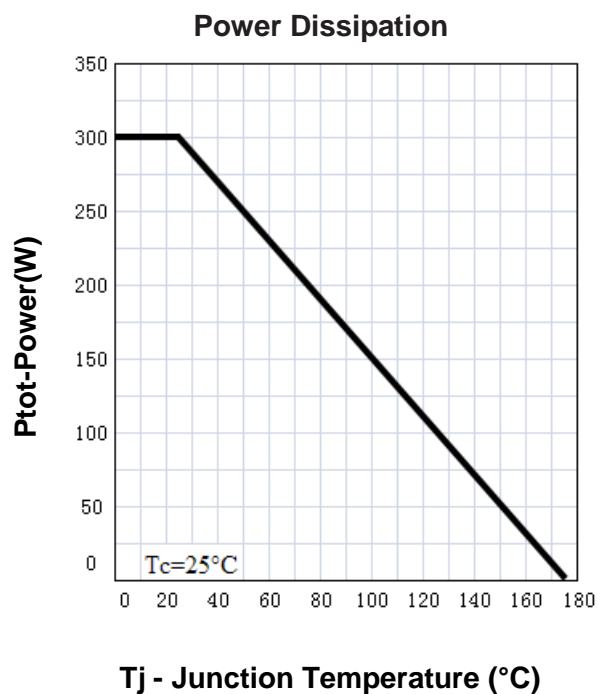
Symbol	Parameter		Rating	Unit
Common Ratings (T <sub>A</sub> =25°C Unless Otherwise Noted)				
V <sub>DSS</sub>	Drain-Source Voltage		100	V
V <sub>GSS</sub>	Gate-Source Voltage		±25	
T <sub>J</sub>	Maximum Junction Temperature		175	°C
T <sub>STG</sub>	Storage Temperature Range		-55 to 175	°C
I <sub>S</sub>	Diode Continuous Forward Current	T <sub>C</sub> =25°C	80 <sup>①</sup>	A
Mounted on Large Heat Sink				
I <sub>DP</sub>	300μs Pulsed Drain Current Tested	T <sub>C</sub> =25°C	320 <sup>②</sup>	A
I <sub>D</sub>	Continue Drain Current	T <sub>C</sub> =25°C	80 <sup>①</sup>	
		T <sub>C</sub> =100°C	75 <sup>①</sup>	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>C</sub> =25°C	300	W
		T <sub>C</sub> =100°C	150	
R <sub>θJC</sub>	Thermal Resistance -Junction to Case		0.5	°C/W
Drain-Source Avalanche Ratings				
E <sub>AS</sub> <sup>③</sup>	Avalanche Energy ,Single Pulsed		800	mJ

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

Symbol	Parameter	Test Condition	RU1088R			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	100			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> =0V			1	μA
		T <sub>J</sub> =85°C			30	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	2	3	4	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±25V, V <sub>DS</sub> =0V			±100	nA
R <sub>DS(ON)</sub> <sup>④</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> = 10V, I <sub>DS</sub> =40A		10	13	mΩ
Diode Characteristics						
V <sub>SD</sub> <sup>④</sup>	Diode Forward Voltage	I <sub>SD</sub> =40A, V <sub>GS</sub> =0V			1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =40A, dI <sub>SD</sub> /dt=100A/μs		90		ns
q <sub>rr</sub>	Reverse Recovery Charge			180		nC
Dynamic Characteristics <sup>⑤</sup>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz		1.5		Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> = 30V, Frequency=1.0MHz		3600		pF
C <sub>oss</sub>	Output Capacitance			510		
C <sub>rss</sub>	Reverse Transfer Capacitance			210		
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =35V, R <sub>L</sub> =35Ω, I <sub>DS</sub> = 1A, V <sub>GEN</sub> = 10V, R <sub>G</sub> =6Ω		25		ns
t <sub>r</sub>	Turn-on Rise Time			13		
t <sub>d(OFF)</sub>	Turn-off Delay Time			80		
t <sub>f</sub>	Turn-off Fall Time			72		
Gate Charge Characteristics <sup>⑤</sup>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =60V, V <sub>GS</sub> = 10V, I <sub>DS</sub> =80A		85		nC
Q <sub>gs</sub>	Gate-Source Charge			20		
Q <sub>gd</sub>	Gate-Drain Charge			30		

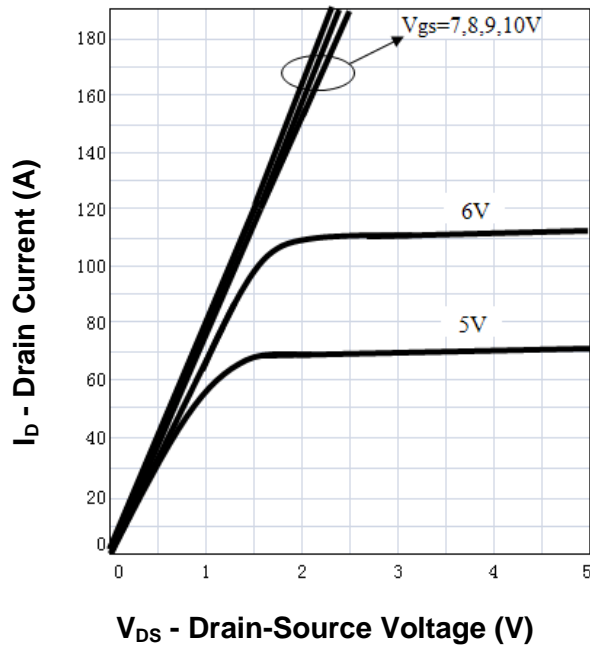
- Notes:
- ① Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.
  - ② Pulse width limited by safe operating area.
  - ③ Limited by  $T_{Jmax}$ ,  $I_{AS}=30A$ ,  $V_{DD}=60V$ ,  $R_G=50\Omega$ , Starting  $T_J=25^{\circ}\text{C}$ .
  - ④ Pulse test; Pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .
  - ⑤ Guaranteed by design, not subject to production testing.

## Typical Characteristics

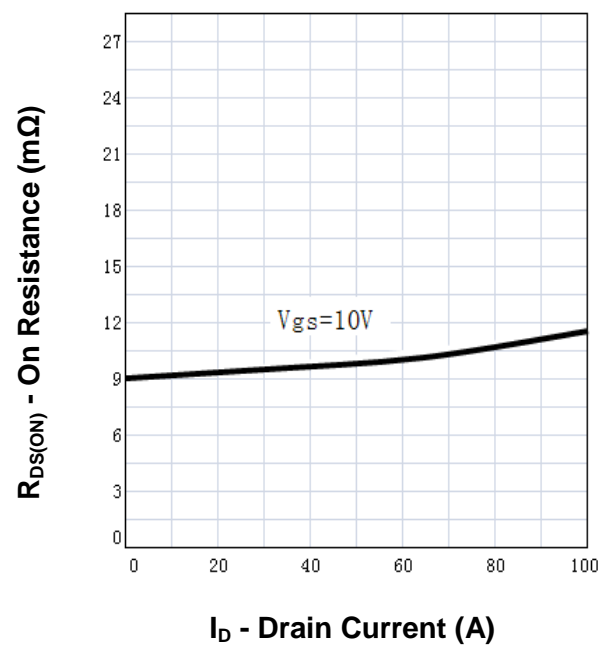


## Typical Characteristics

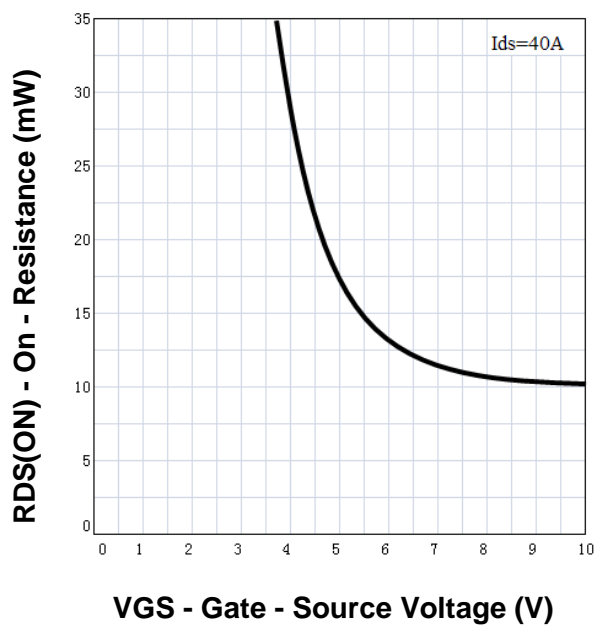
**Output Characteristics**



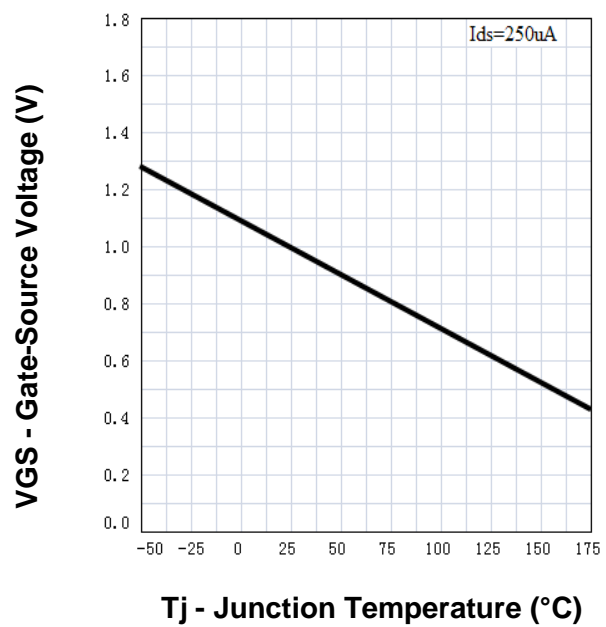
**Drain-Source On Resistance**



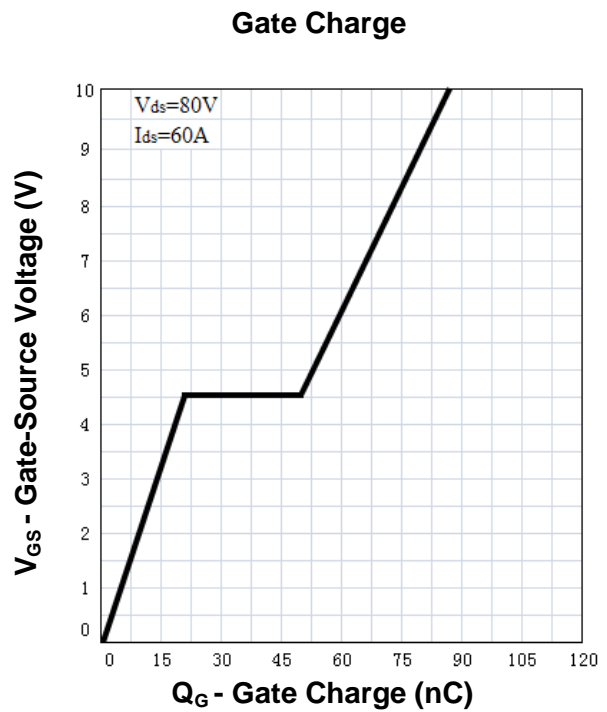
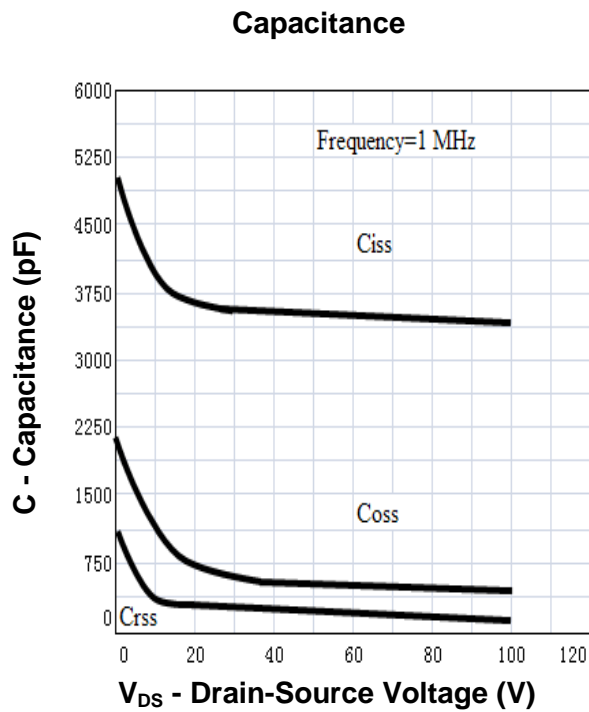
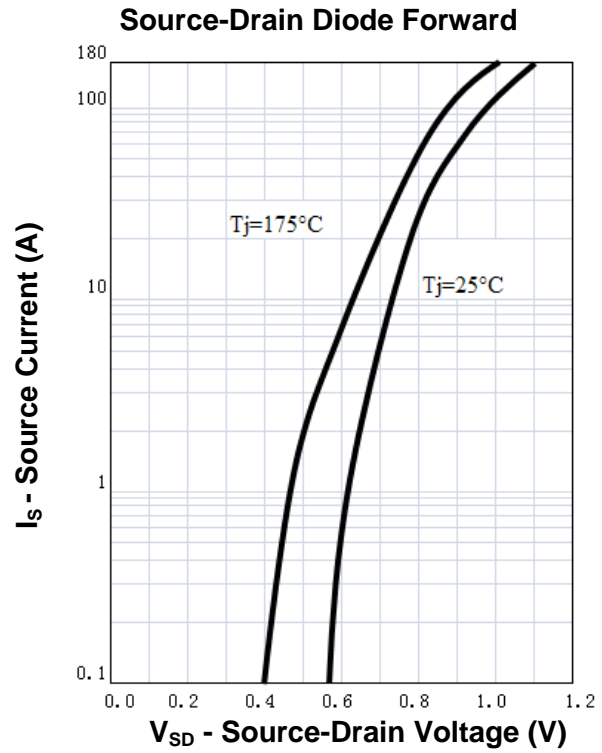
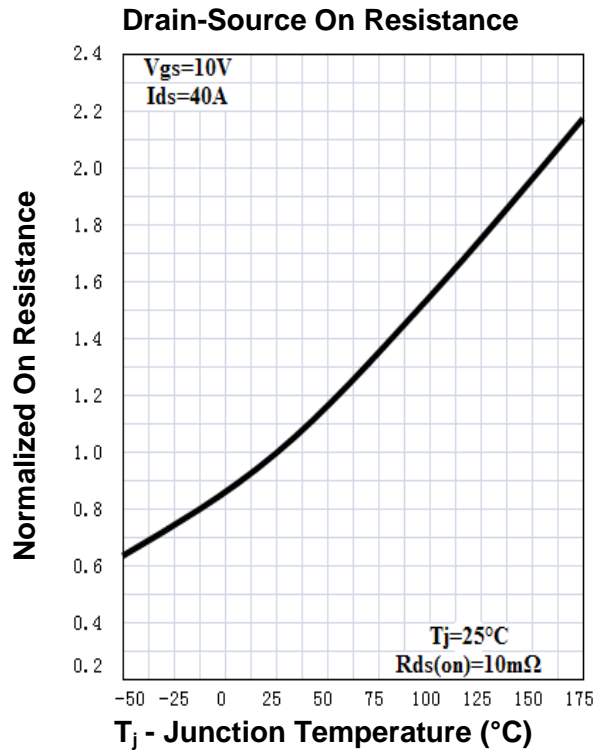
**Drain-Source On Resistance**



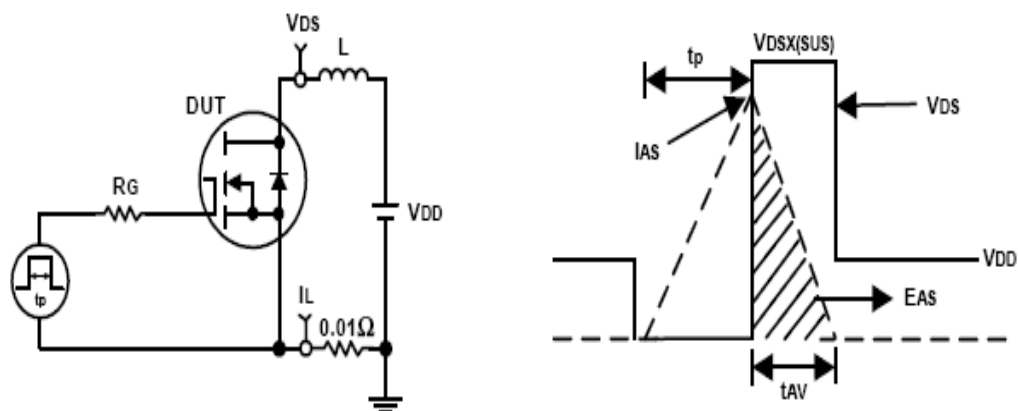
**Gate Threshold Voltage**



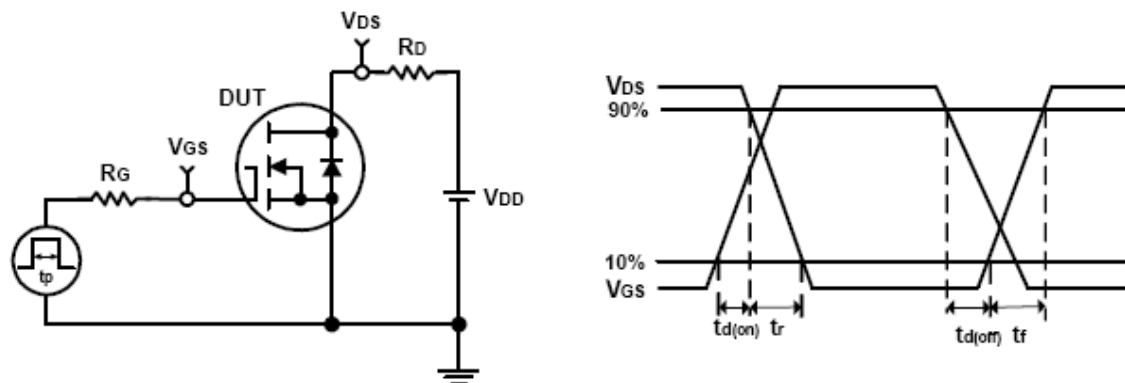
## Typical Characteristics



## Avalanche Test Circuit and Waveforms



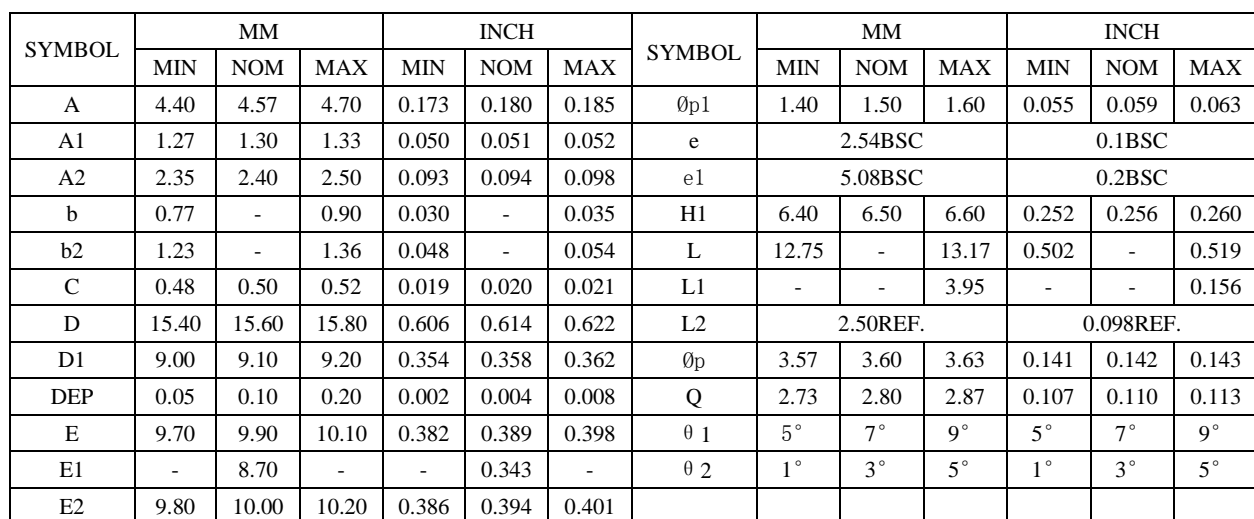
## Switching Time Test Circuit and Waveforms



## Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU1088R	RU1088R	TO-220	Tube	50	-	-

# TO-220FB-3L



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