

## Features

- 60V/140A,  
 $R_{DS(ON)} = 7m\Omega(Typ.)@V_{GS}=10V$
- Planar Technology
- High Ruggedness
- Enhanced FBSOA for superior linear mode operation
- 100% Avalanche Tested

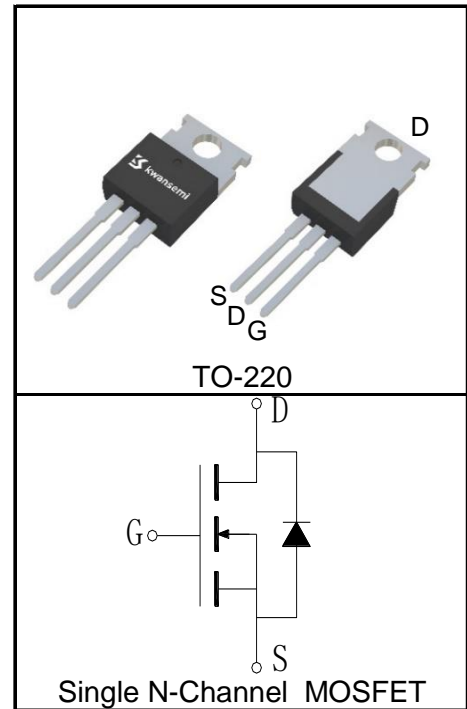
## Applications

- DC-DC Converters and Off-line UPS
- Power Management in Inverter System



Halogen-Free

## Pin Description



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
<b>Common Ratings</b> ( $T_C=25^\circ\text{C}$ Unless Otherwise Noted)				
$V_{DSS}$	Drain-Source Voltage	60	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$		
$T_{Jmax}$	Maximum Junction Temperature	175	$^\circ\text{C}$	
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	140	A
<b>Mounted on Large Heat Sink</b>				
$I_{DP}^{①}$	Pulse Drain Current	$T_C=25^\circ\text{C}$	560	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ\text{C}$	140	A
		$T_C=100^\circ\text{C}$	99	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	340	W
		$T_C=100^\circ\text{C}$	170	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.44	$^\circ\text{C/W}$	
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C/W}$	
<b>Drain-Source Avalanche Ratings</b>				
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	1849	mJ	

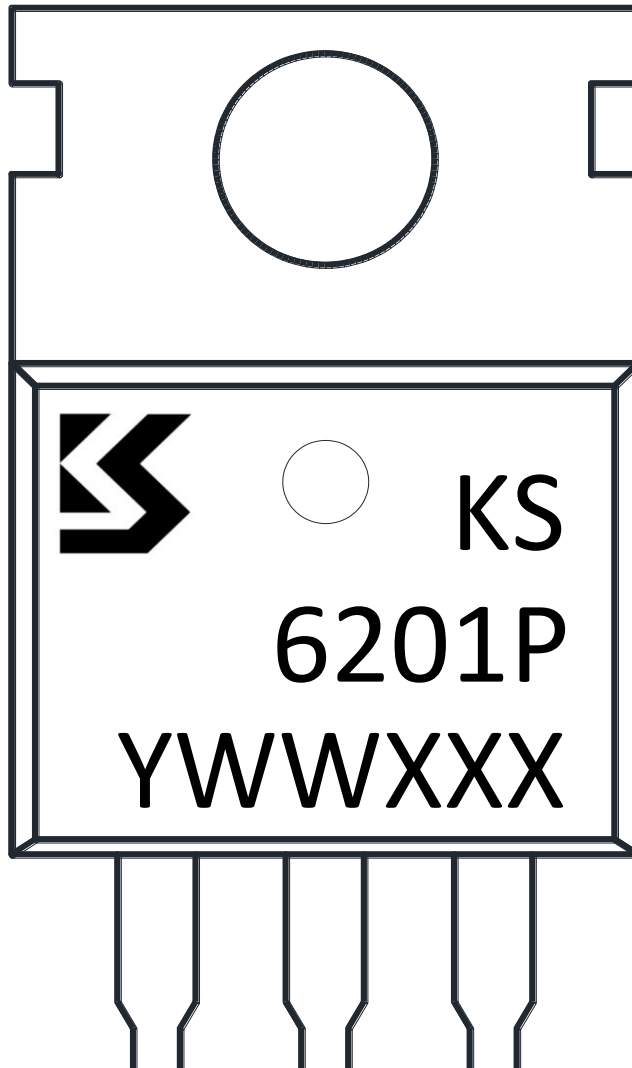
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS6201CAP			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
$R_{DS(ON)}^{⑤}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=40A$		7	8.5	$m\Omega$
		$V_{GS}=6V, I_{DS}=20A$		9.5	13	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{⑤}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$		0.85	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=40A, dI_{SD}/dt=100A/\mu s$		47		ns
$Q_{rr}$	Reverse Recovery Charge			86		nC
<b>Dynamic Characteristics</b> <sup>⑥</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz		2695		pF
$C_{oss}$	Output Capacitance			875		
$C_{rss}$	Reverse Transfer Capacitance			380		
$t_{d(ON)}$	Turn-on Delay Time		$V_{DD}=30V, I_{DS}=40A,$ $V_{GEN}=10V, R_G=6\Omega$		24	
$t_r$	Turn-on Rise Time			35		
$t_{d(OFF)}$	Turn-off Delay Time			66		
$t_f$	Turn-off Fall Time			19		
<b>Gate Charge Characteristics</b> <sup>⑥</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=30V, V_{GS}=10V,$ $I_{DS}=40A$		114		nC
$Q_{gs}$	Gate-Source Charge			13		
$Q_{gd}$	Gate-Drain Charge			58		

- 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 When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ . The value in any given application depends on the user's specific board design.
  - ④ Limited by  $T_{Jmax}$ , Starting  $T_J = 25^\circ\text{C}$ ,  $I_{ASmax} = 86A$ ,  $L = 0.5\text{mH}$ ,  $V_{DD} = 48V$ ,  $R_G = 25\Omega$ ,  $V_{GS} = 10V$ . Part not recommended for use above this value. 100% Final Test at  $I_{AS} = 60A$ ,  $L = 0.5\text{mH}$ .
  - ⑤ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑥ Guaranteed by design, not subject to production testing.

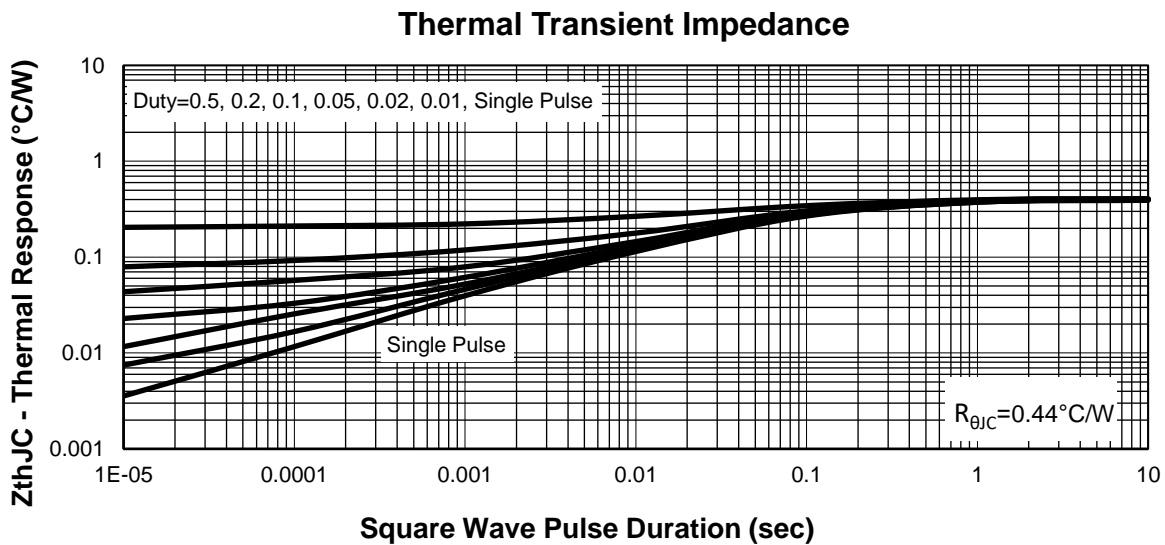
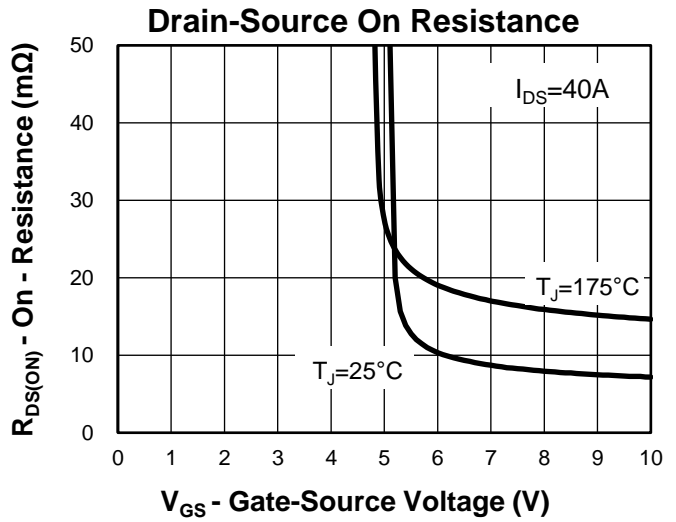
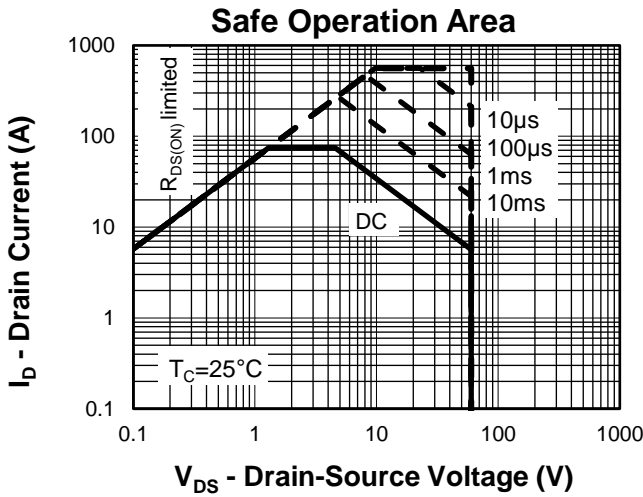
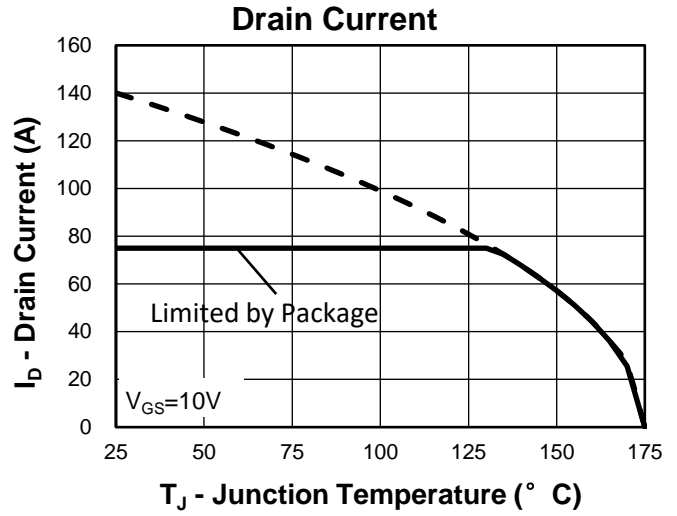
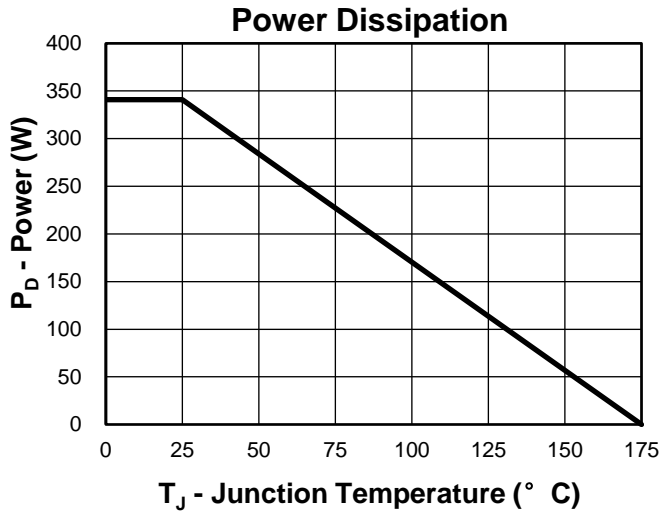
**Ordering and Marking Information**

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS6201CAP	TO-220	Tube	50	-	-

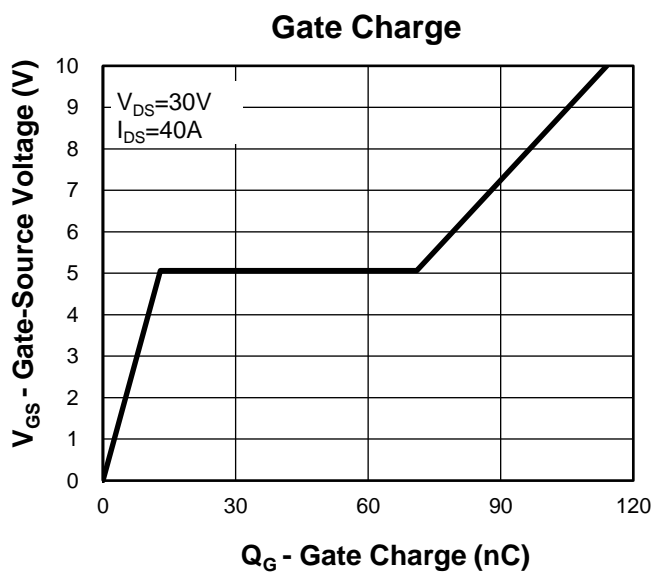
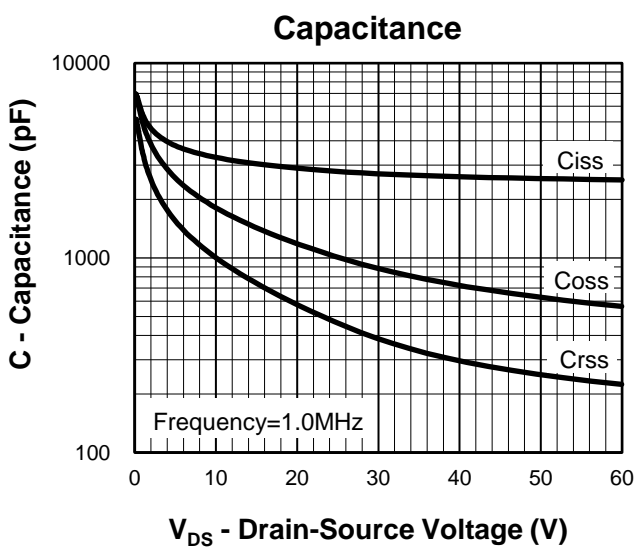
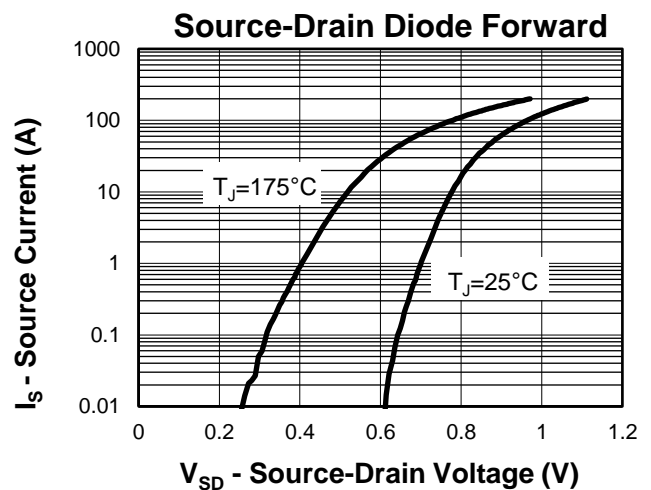
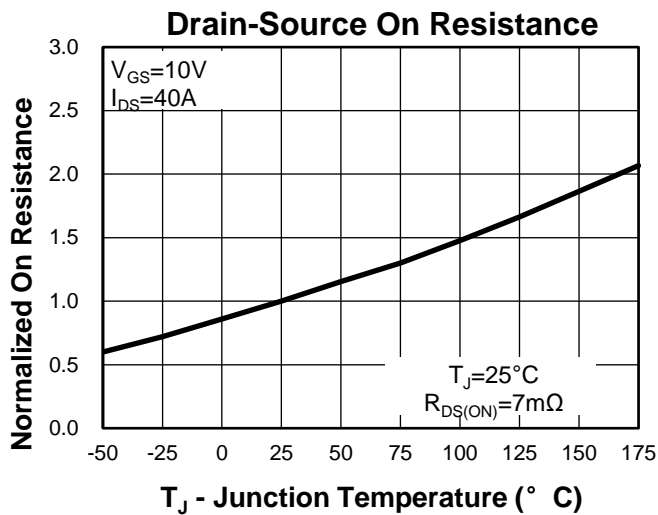
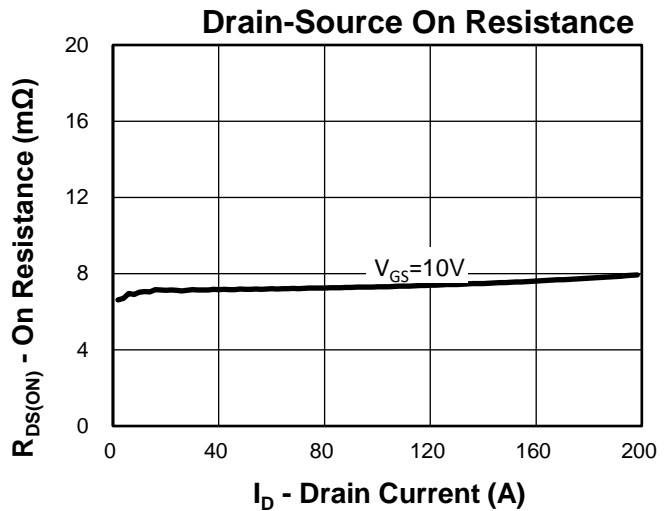
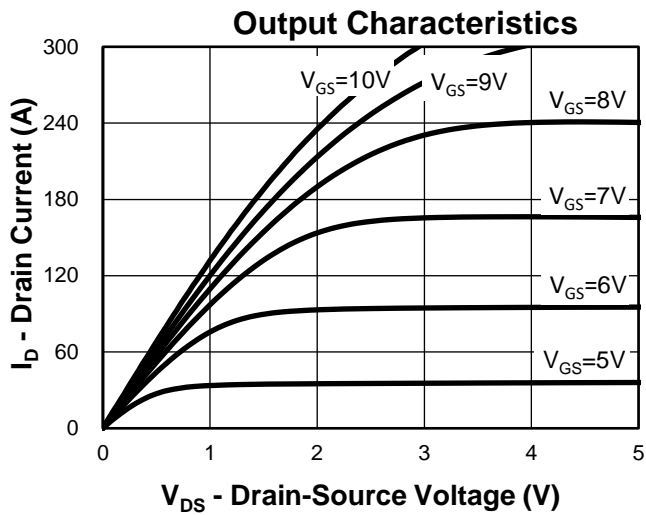


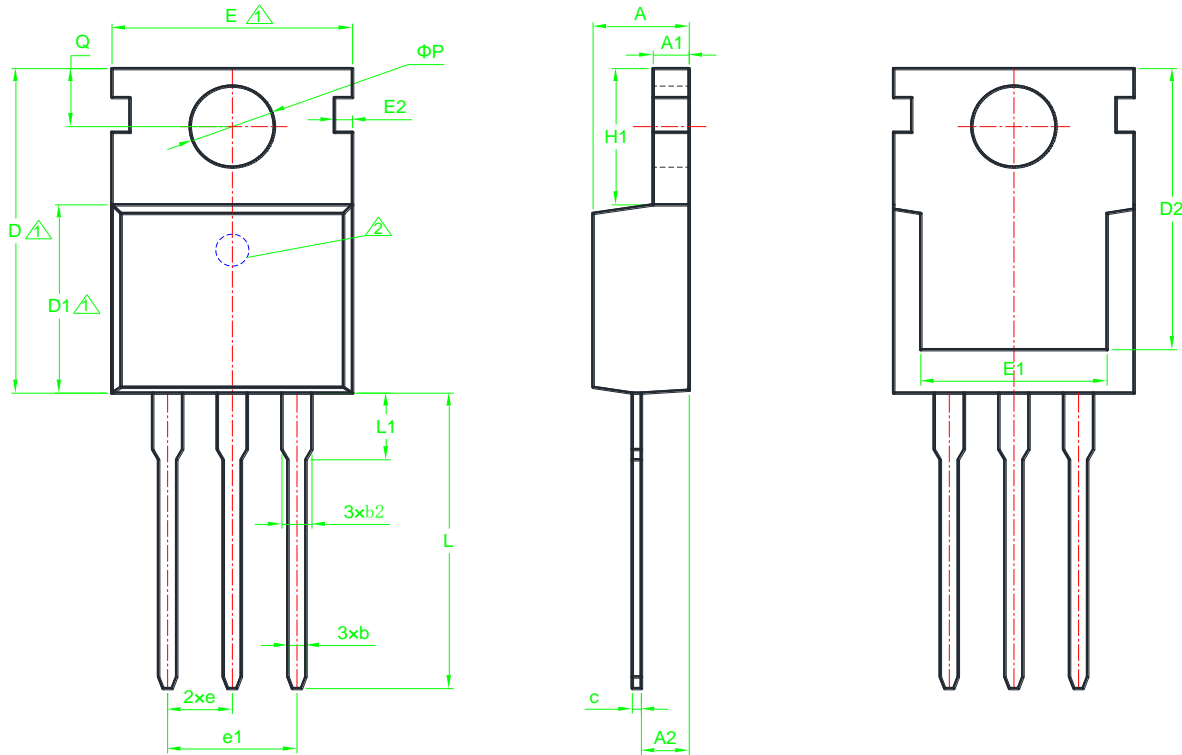
1st Line: Kwansemi LOGO, Kwansemi Code(KS)  
2nd Line: Part Number(6201P)  
3rd Line: Lot Number(YWWXXX)

### Typical Characteristics



### Typical Characteristics



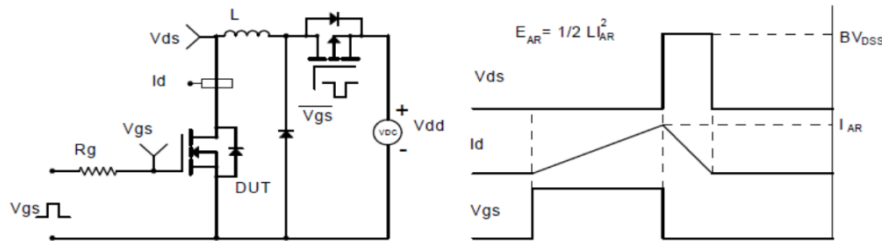
**Package Information**
**TO-220**


SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.30	4.55	4.80	0.169	0.179	0.189	E1	7.00	*	8.40	0.276	*	0.331
A1	1.20	1.30	1.45	0.047	0.051	0.057	E2	*	*	0.75	*	*	0.030
A2	2.20	2.40	2.70	0.087	0.094	0.106	e	2.54BSC			0.100BSC		
b	0.70	0.80	0.95	0.028	0.031	0.037	e1	5.08BSC			0.200BSC		
b2	1.15	1.35	1.50	0.045	0.053	0.059	H1	6.30	6.50	6.80	0.248	0.256	0.268
c	0.40	0.50	0.60	0.016	0.020	0.024	L	12.70	13.20	13.90	0.500	0.520	0.547
D	15.10	15.60	16.10	0.594	0.614	0.634	L1	2.85	*	3.50	0.112	*	0.138
D1	8.75	9.20	9.65	0.344	0.362	0.380	$\Phi P$	3.50	3.65	3.80	0.138	0.144	0.150
D2	12.20	12.50	12.80	0.480	0.492	0.504	Q	2.70	*	2.90	0.106	*	0.114
E	9.70	10.00	10.30	0.382	0.394	0.406							

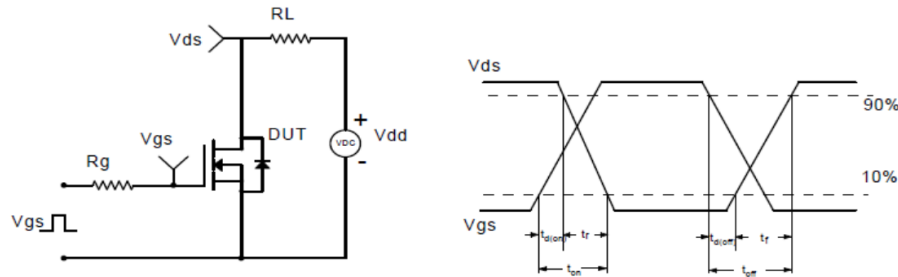
① Dimensions D and D1 and E do not include mold flash protrusions or gate burrs.

② The existence and size of demolding hole are variable depending on mold.

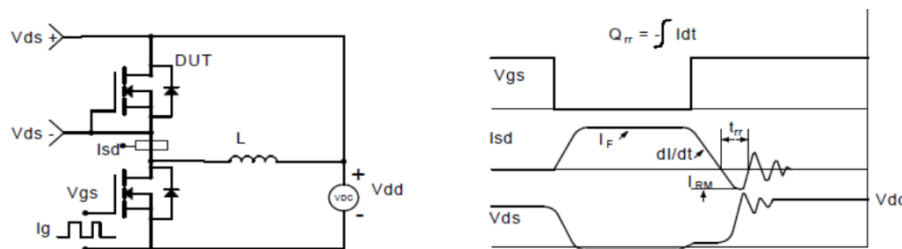
### Avalanche Test Circuit and Waveforms



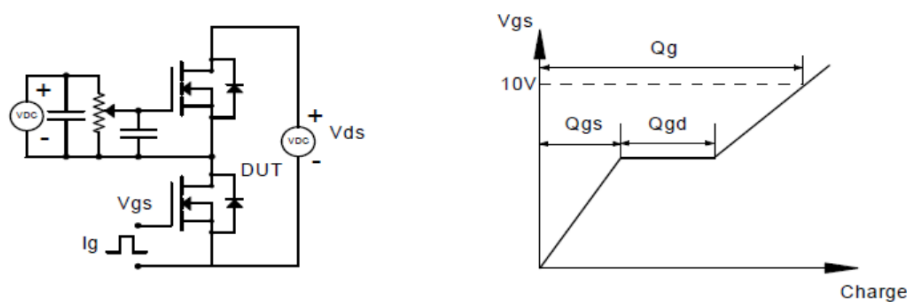
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

Kwansemi Semiconductor Co.,Ltd

Email:Sales@kwansemi.com

Web:www.kwansemi.com

### DISCLAIMER:

Kwansemi reserves the right to change the specifications and circuitry without notice at any time. The Products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any Product can reasonably be expected to result in a personal injury. Seller's customers using or selling Seller's products for use in such applications do so at their own risk and agree to fully defend and indemnify Seller.