

### Features

- 85V/130A,  
 $R_{DS(ON)} = 4.4m\Omega(Typ.)@V_{GS}=10V$
- Excellent  $Q_G \times R_{DS(on)}$  product(FOM)
- SGT Technology
- 100% Avalanche Tested

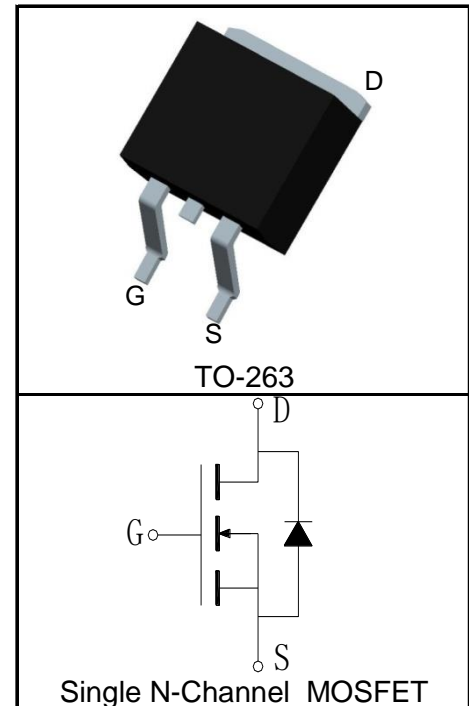
### Applications

- 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> ( $T_C=25^\circ C$ Unless Otherwise Noted)				
$V_{DSS}$	Drain-Source Voltage	85	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$		
$T_J$	Maximum Junction Temperature	175	$^\circ C$	
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$	
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ C$	130	A
<b>Mounted on Large Heat Sink</b>				
$I_{DP}^{①}$	300 $\mu s$ Pulse Drain Current Tested	$T_C=25^\circ C$	520	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ C$	130	A
		$T_C=100^\circ C$	92	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ C$	150	W
		$T_C=100^\circ C$	75	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1	$^\circ C/W$	
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ C/W$	
<b>Drain-Source Avalanche Ratings</b>				
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	256	mJ	

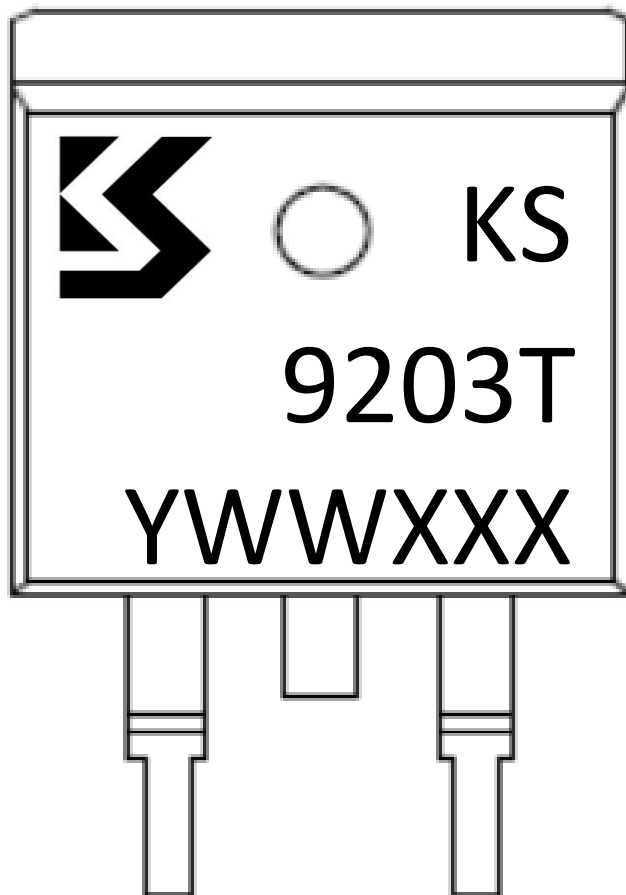
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS9203GAT			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	85	92		V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$			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	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	$V_{GS}=10V, I_{DS}=40A$		4.4	5.5	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$		0.88	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=40A, dI_{SD}/dt=100A/\mu s$		28		ns
$Q_{rr}$	Reverse Recovery Charge			41		nC
<b>Dynamic Characteristics<sup>(6)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		2.5		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=40V,$ Frequency=1.0MHz		2455		pF
$C_{oss}$	Output Capacitance			920		
$C_{riss}$	Reverse Transfer Capacitance			45		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=40V, I_{DS}=40A,$ $V_{GEN}=10V, R_G=3\Omega$		12		ns
$t_r$	Turn-on Rise Time			19		
$t_{d(OFF)}$	Turn-off Delay Time			25		
$t_f$	Turn-off Fall Time			10		
<b>Gate Charge Characteristics<sup>(6)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=40V, V_{GS}=10V,$ $I_{DS}=40A$		39		nC
$Q_{gs}$	Gate-Source Charge			9		
$Q_{gd}$	Gate-Drain Charge			7		

- 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  $T_{Jmax}, I_{AS}=32A, L=0.5mH, V_{DD}=48V, R_G=25\Omega$ , Starting  $T_J=25^\circ C$ .
  - 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
KS9203GAT	TO-263	Tape&Reel	800	13"	24mm

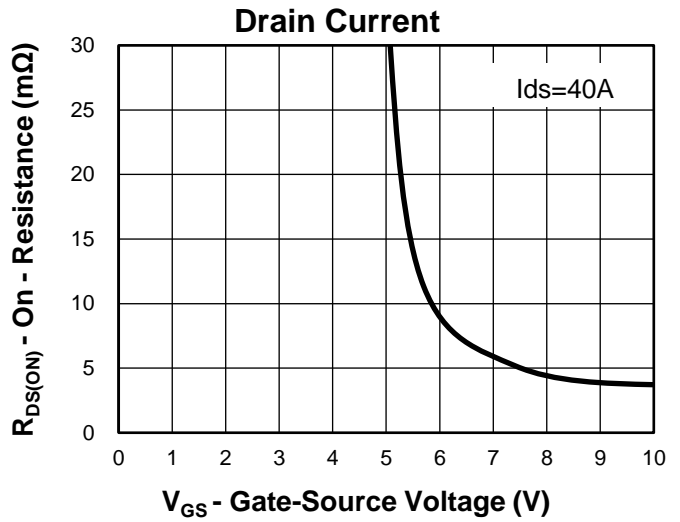
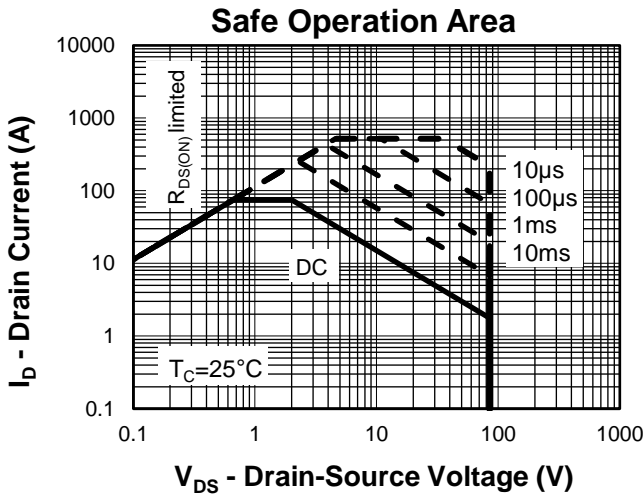
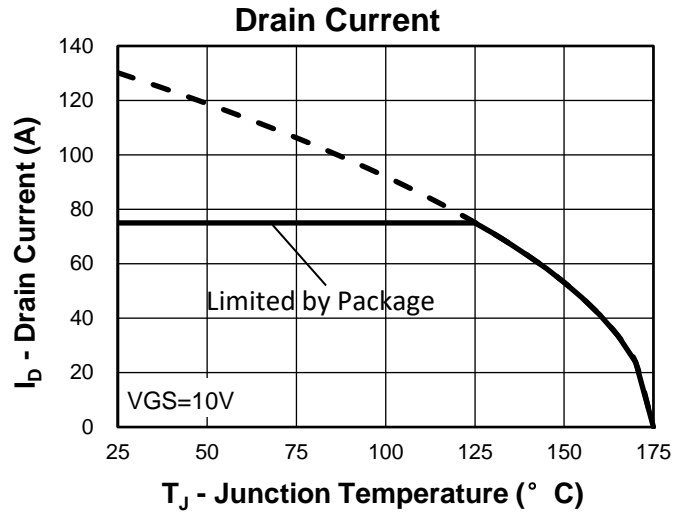
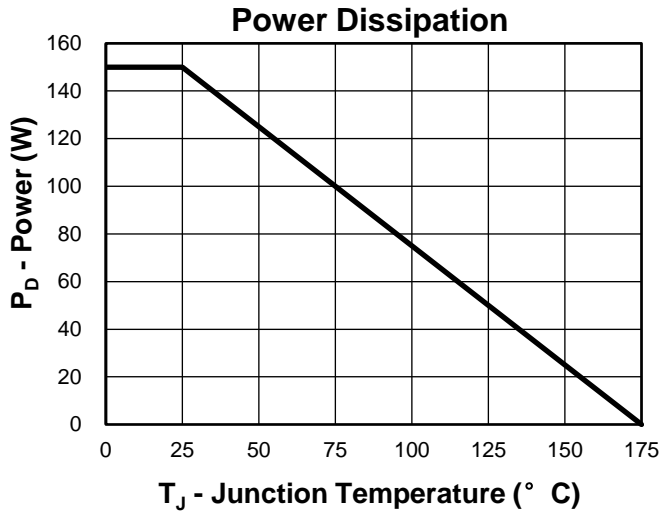


Y =Year,2017-A,2018-B,etc.

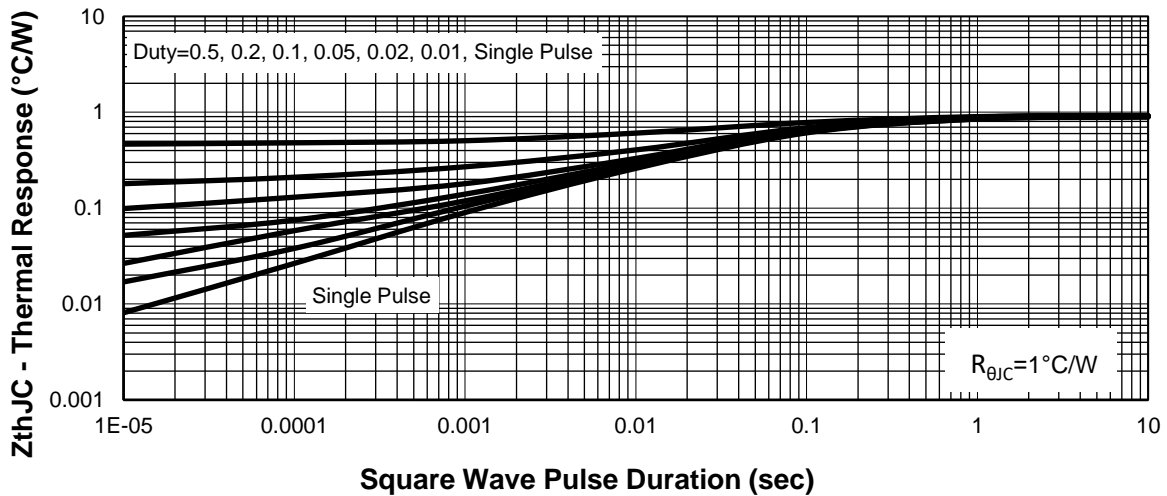
WW =Week.

XXX =Lot number.

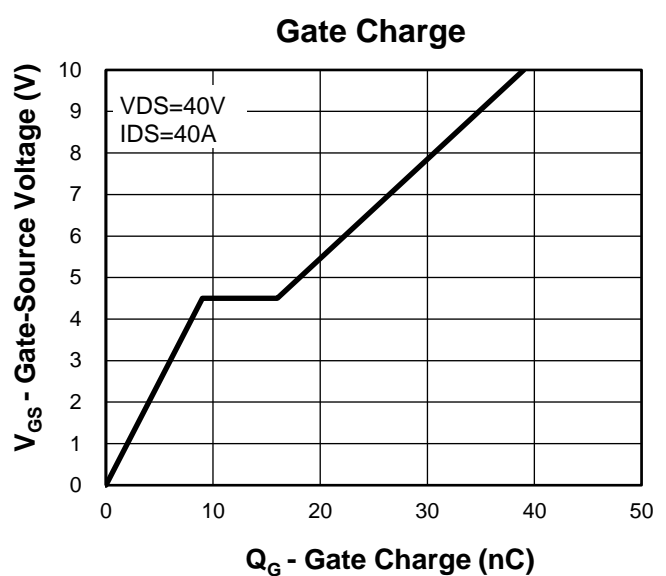
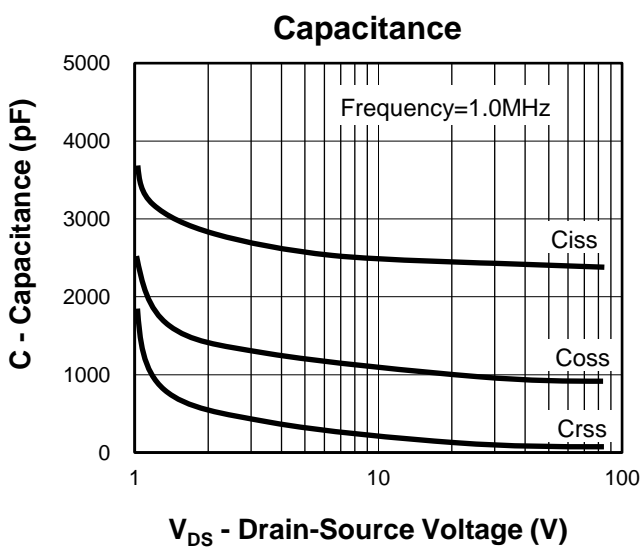
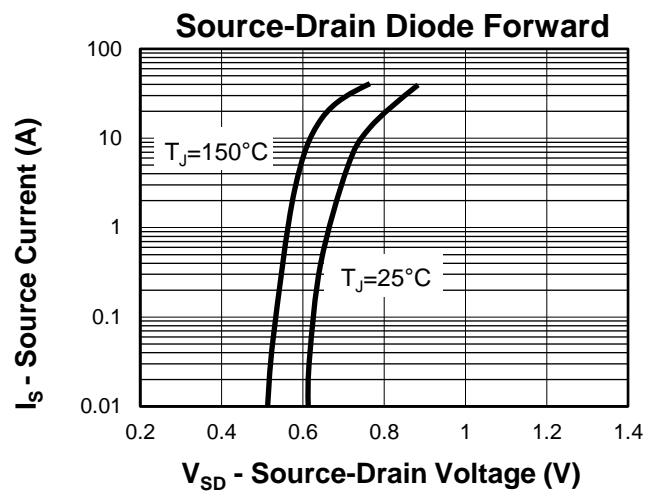
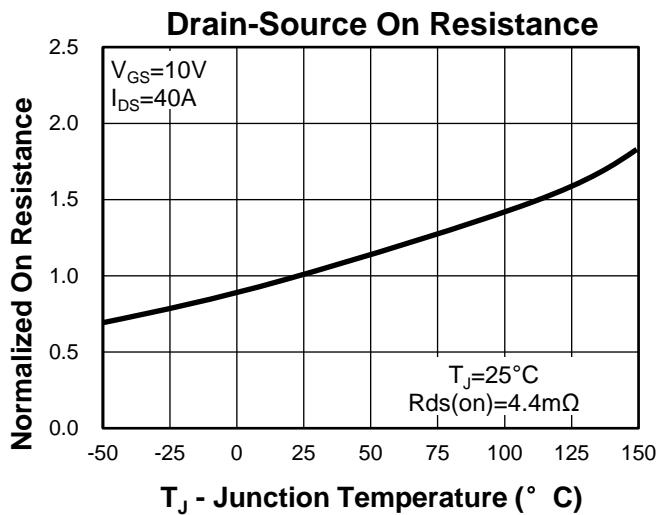
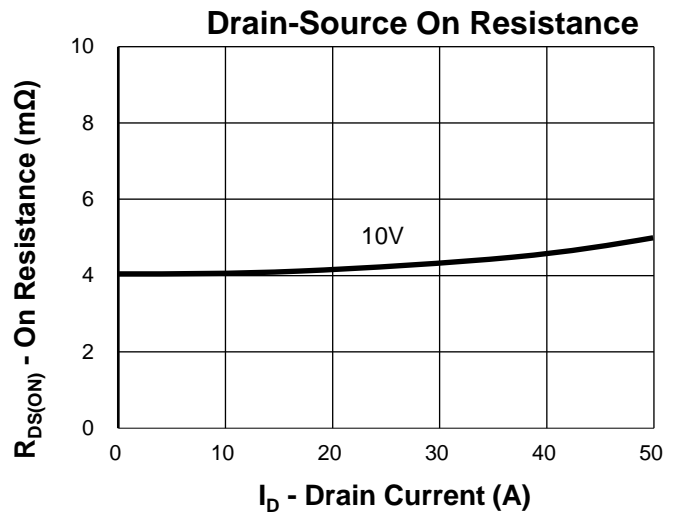
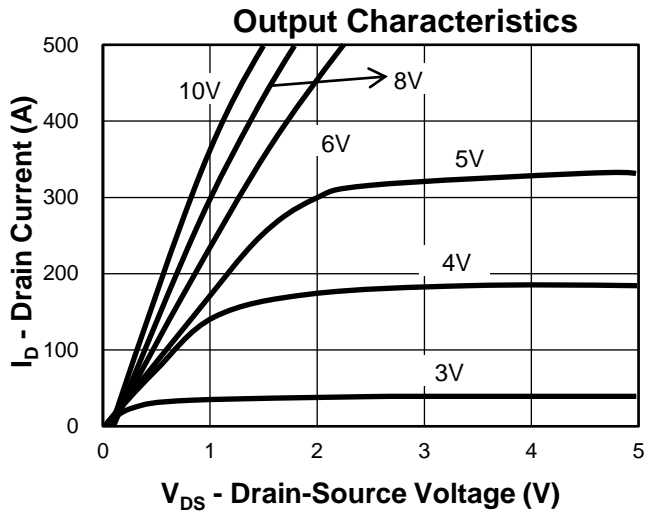
Typical Characteristics

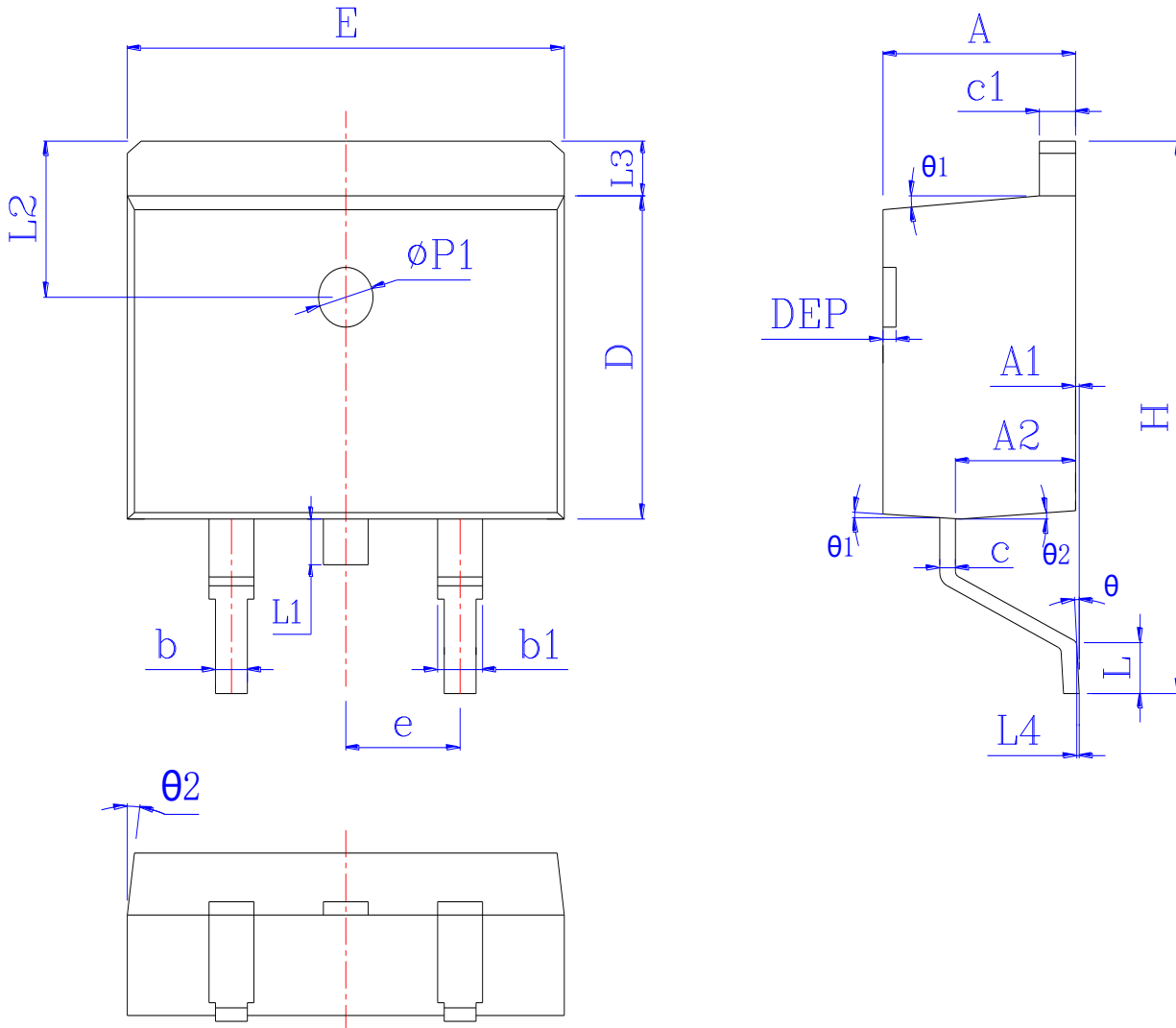


Thermal Transient Impedance



### Typical Characteristics



**Package Information**
**TO-263**


SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.55	4.72	0.173	0.179	0.186	L	1.94	2.30	2.60	0.076	0.091	0.102
A1	0.00	0.10	0.25	0.000	0.005	0.010	L3	1.17	1.29	1.40	0.046	0.051	0.055
A2	2.59	2.69	2.79	0.102	0.106	0.110	L1	*	*	1.70	*	*	0.067
b	0.76	*	0.90	0.030	*	0.035	L4	0.25 BSC			0.01 BSC		
b1	1.22	*	1.36	0.048	*	0.054	L2	2.50 REF			0.098 REF		
c	0.33	*	0.47	0.013	*	0.019	$\theta$	0°	*	8°	0°	*	8°
c1	1.22	*	1.32	0.048	*	0.052	$\theta1$	5°	7°	9°	5°	7°	9°
D	8.60	*	9.29	0.339	*	0.366	$\theta2$	1°	3°	5°	1°	3°	5°
E	9.95	*	10.26	0.392	*	0.404	DEP	0.05	0.10	0.20	0.002	0.004	0.008
e	2.54BSC			0.100BSC			$\phi P1$	1.40	1.50	1.60	0.055	0.059	0.063
H	14.70	15.10	15.79	0.579	0.594	0.622							

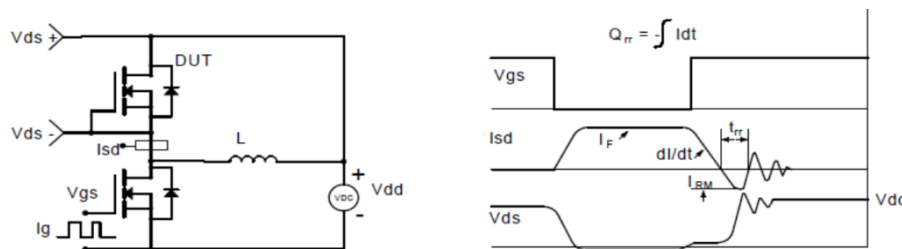
### Avalanche Test Circuit and Waveforms



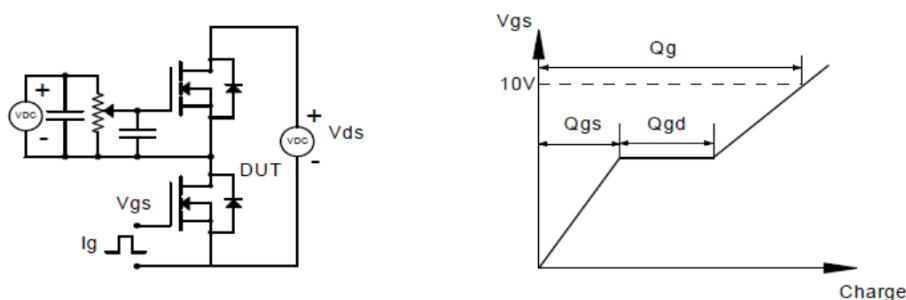
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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