

### Features

- 60V/90A,  
 $R_{DS(ON)} = 5m\Omega(Typ.)@V_{GS}=10V$   
 $R_{DS(ON)} = 6m\Omega(Typ.)@V_{GS}=4.5V$
- Low  $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged

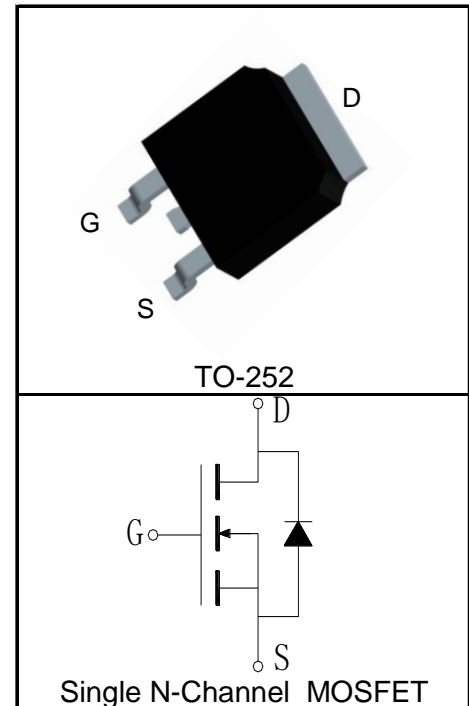
### Applications

- Power Switching Appliaction
- Load Switching



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	$\pm 20$	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 90	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{(1)}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 360	A
$I_D^{(2)}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ\text{C}$ 90	A
		$T_C=100^\circ\text{C}$ 57	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 89	W
		$T_C=100^\circ\text{C}$ 36	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.4	$^\circ\text{C/W}$
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed	156	mJ

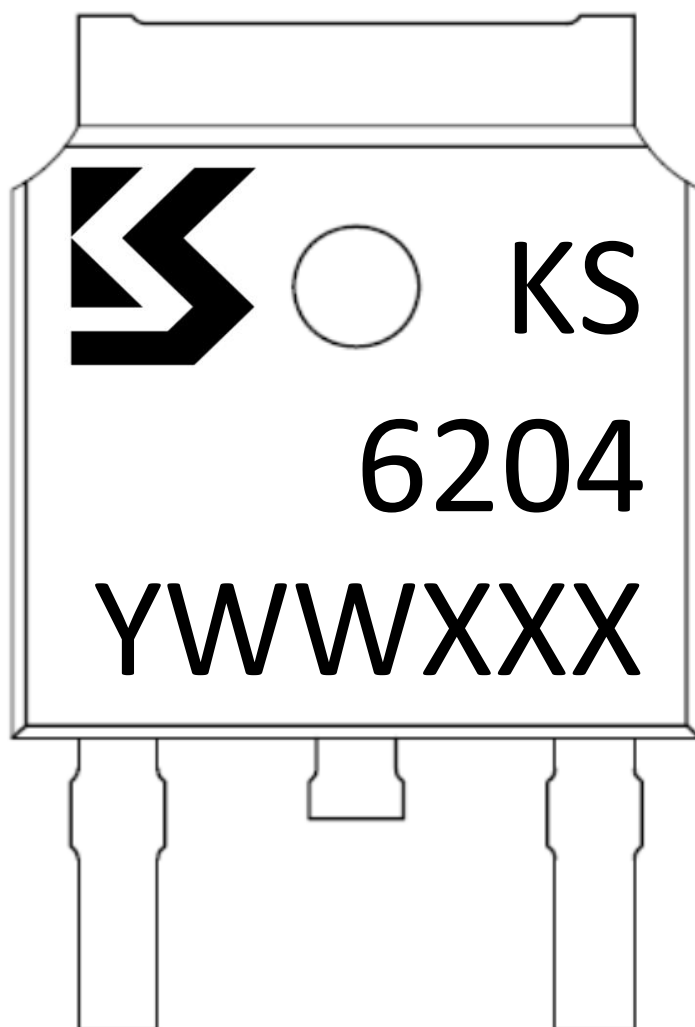
**Electrical Characteristics** ( $T_C=25^{\circ}\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS6204DD			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	60			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
		T <sub>J</sub> =125°C			30	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	1.2	1.6	2.3	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
R <sub>DS(ON)</sub> <sup>⑤</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =20A		5	6.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>DS</sub> =16A		6	8	mΩ
Diode Characteristics						
V <sub>SD</sub> <sup>⑤</sup>	Diode Forward Voltage	I <sub>SD</sub> =20A, V <sub>GS</sub> =0V		0.79	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =20A, dI <sub>SD</sub> /dt=100A/μs		38		ns
Q <sub>rr</sub>	Reverse Recovery Charge			75		nC
Dynamic Characteristics <sup>⑥</sup>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz		1.6		Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V, Frequency=1.0MHz		3800		pF
C <sub>oss</sub>	Output Capacitance			435		
C <sub>rss</sub>	Reverse Transfer Capacitance			160		
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =30V, I <sub>DS</sub> =20A, V <sub>GEN</sub> =10V, R <sub>G</sub> =3Ω		22		ns
t <sub>r</sub>	Turn-on Rise Time			31		
t <sub>d(OFF)</sub>	Turn-off Delay Time			66		
t <sub>f</sub>	Turn-off Fall Time			28		
Gate Charge Characteristics <sup>⑥</sup>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>DS</sub> =20A		65		nC
Q <sub>gs</sub>	Gate-Source Charge			13		
Q <sub>gd</sub>	Gate-Drain Charge			28		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 60A.
  - 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  $T_{Jmax}$ ,  $I_{AS}=25A$ ,  $L=0.5\text{mH}$ ,  $V_{DD}=30V$ ,  $R_G=25\Omega$ , Starting  $T_J=25^{\circ}\text{C}$ .
  - 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
KS6204DD	TO-252	Tape&Reel	2500	13"	16mm

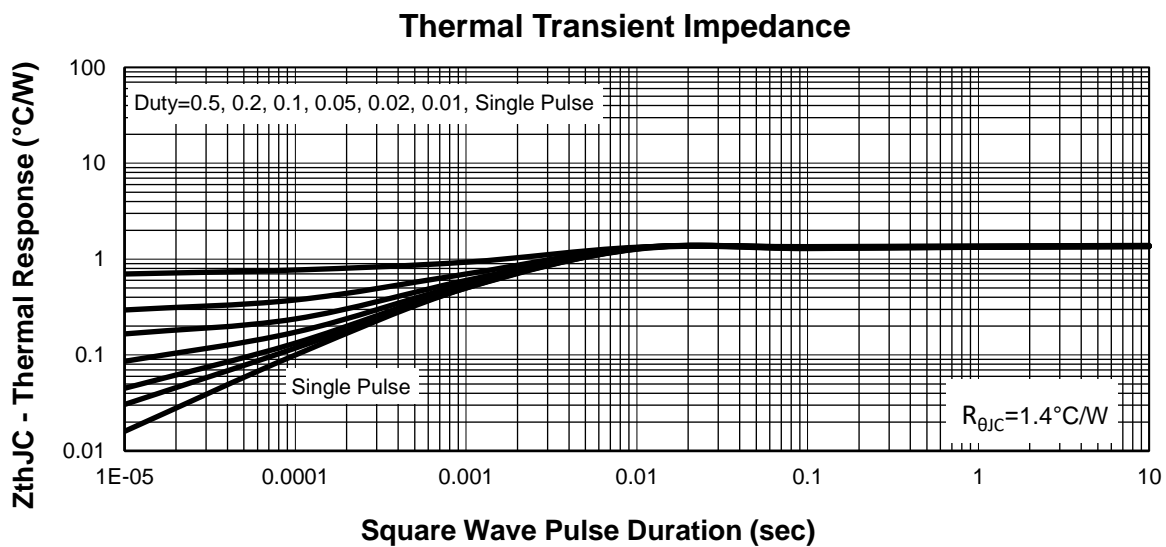
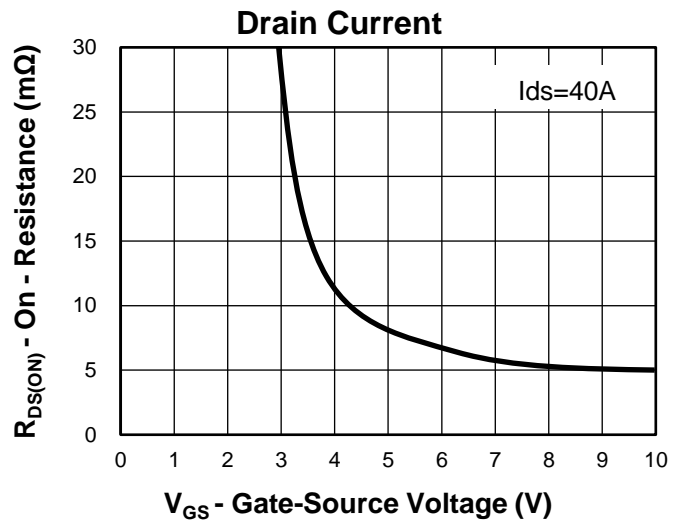
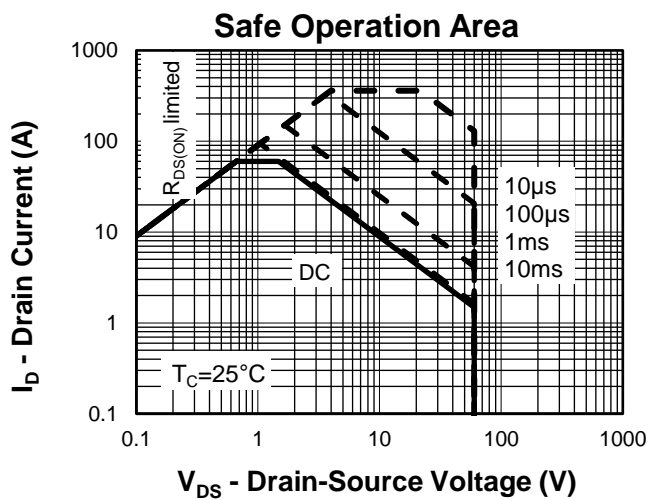
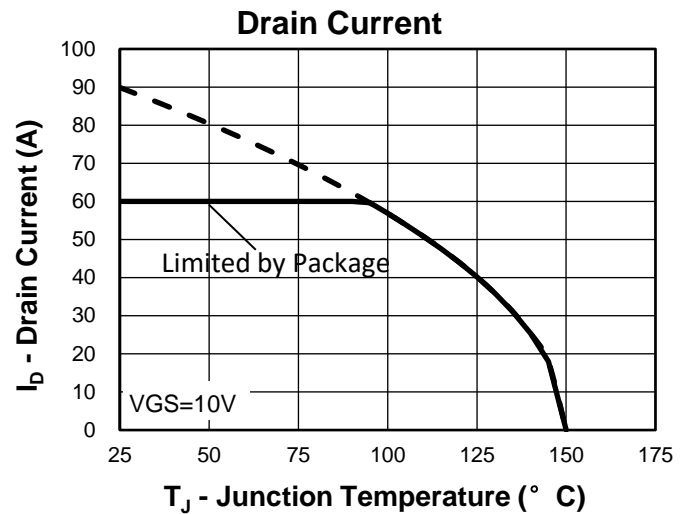
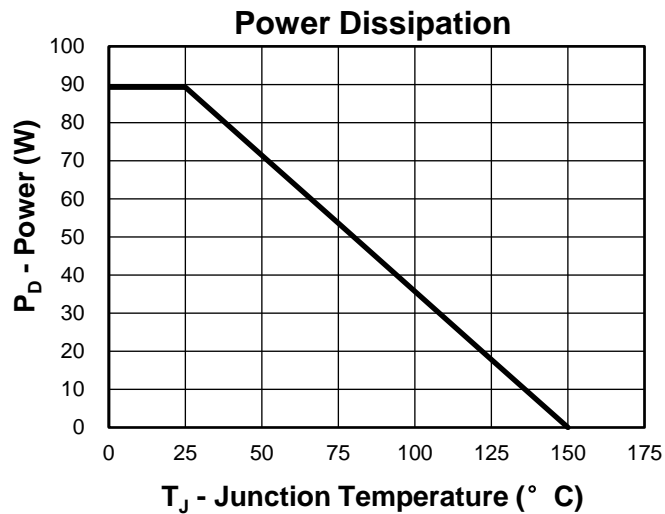


Y       =Year,2017-A,2018-B,etc.

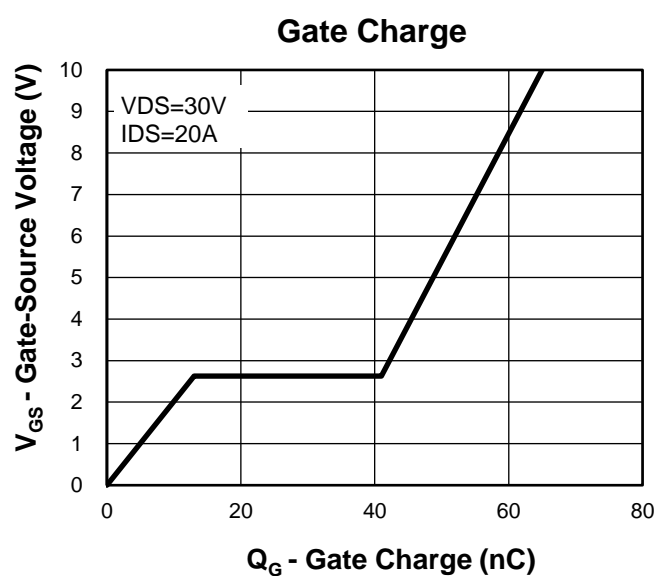
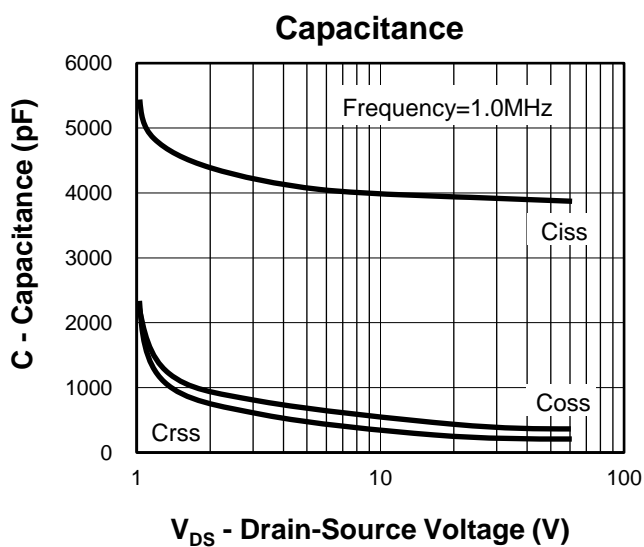
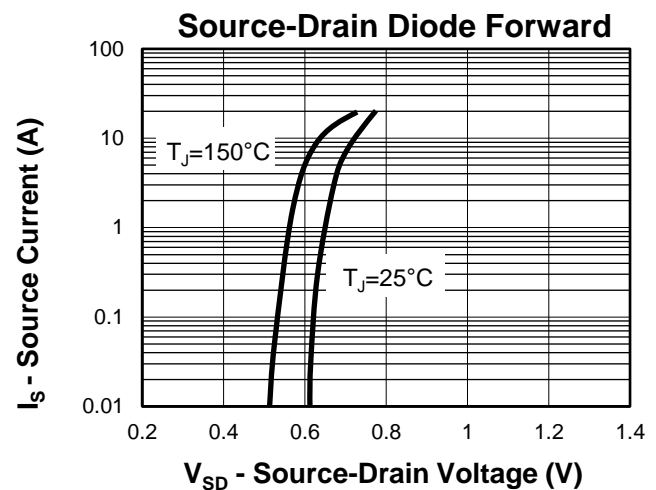
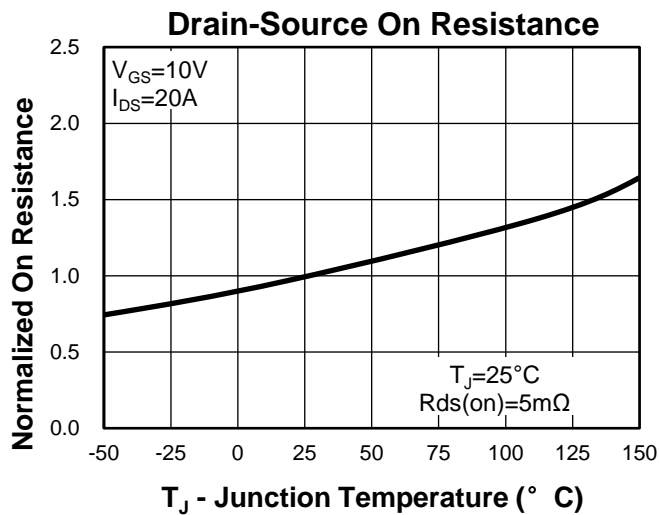
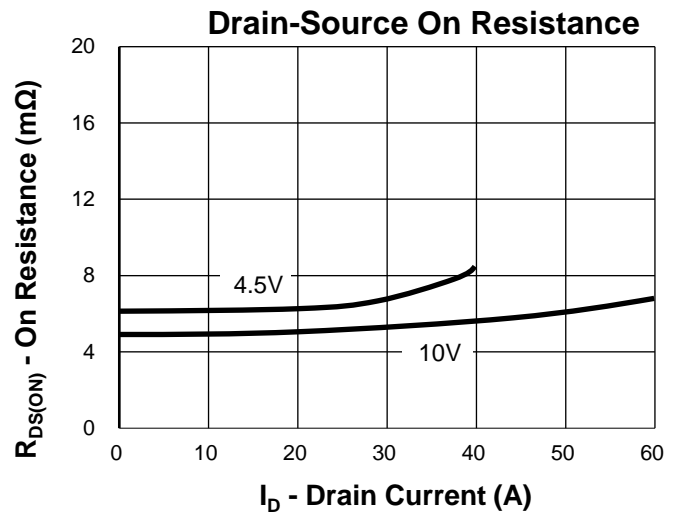
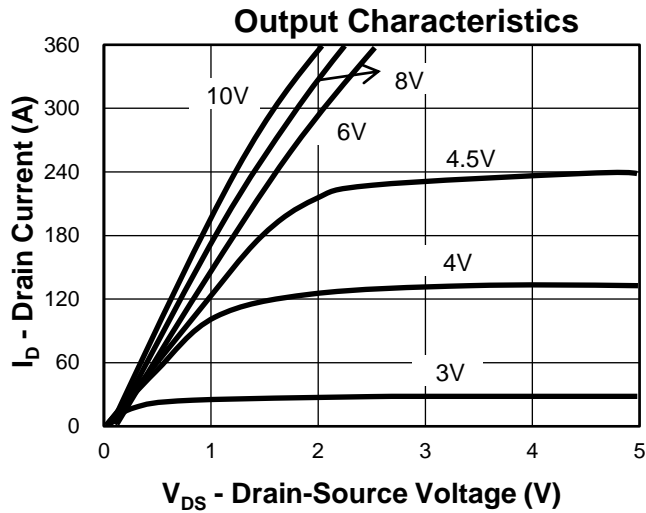
WW     =Week.

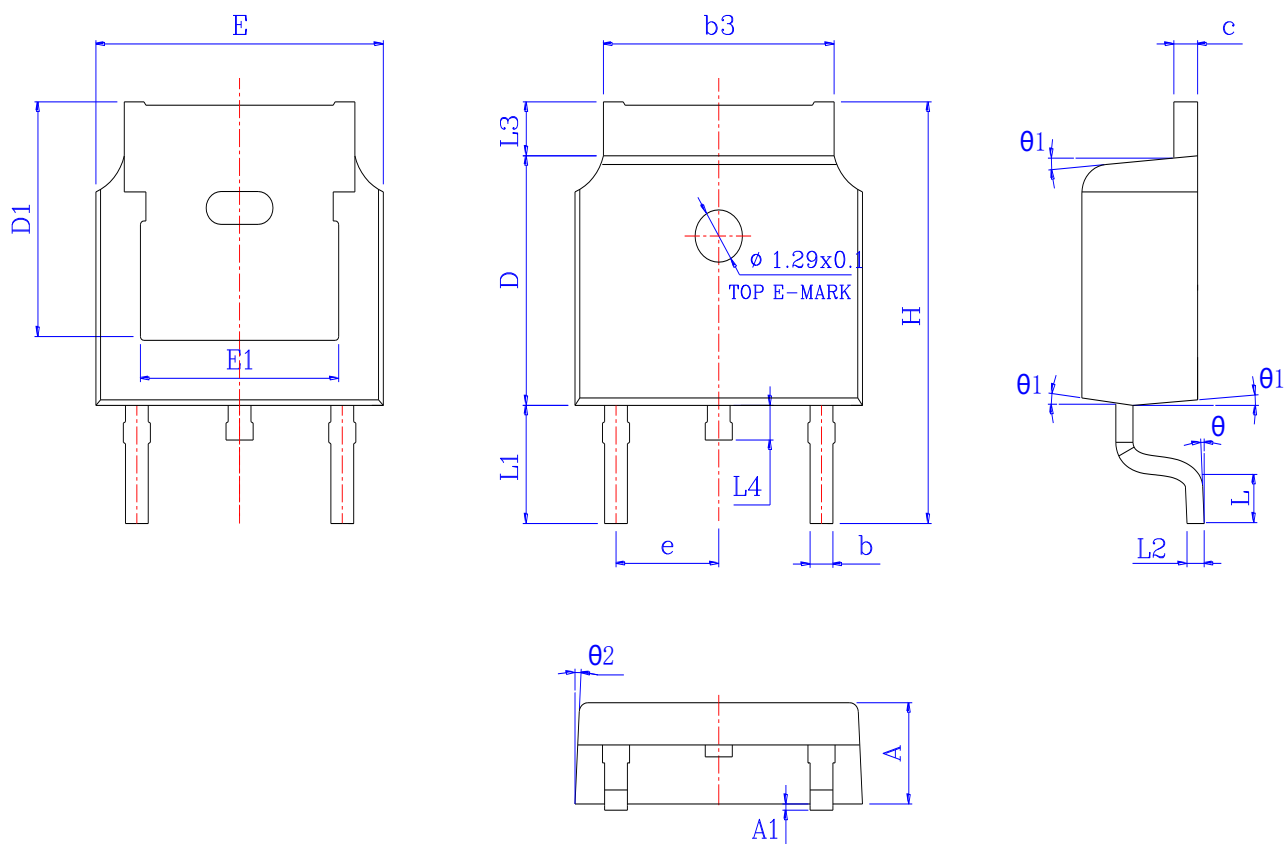
XXX    =Lot number.

## Typical Characteristics



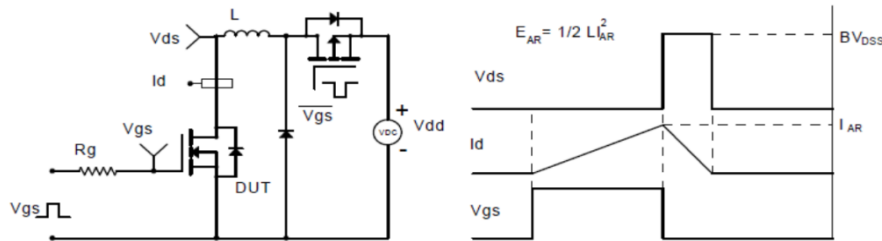
## Typical Characteristics



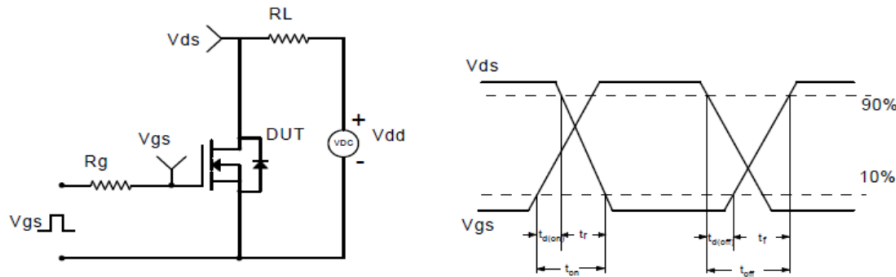
**Package Information**
**TO-252**


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.200	2.300	2.400	0.087	0.091	0.094
A1	*	*	0.100	*	*	0.004
b	0.660	0.760	0.860	0.026	0.030	0.034
b3	5.130	5.295	5.460	0.202	0.208	0.215
c	0.470	0.535	0.600	0.019	0.021	0.024
D	6.000	6.100	6.200	0.236	0.240	0.244
D1	5.30 REF			0.20 REF		
E	6.500	6.600	6.700	0.256	0.260	0.264
E1	4.700	4.810	4.920	0.185	0.189	0.194
e	2.28 REF			0.09 REF		
H	9.800	10.100	10.400	0.386	0.398	0.409
L	1.400	1.550	1.700	0.055	0.061	0.067
L1	2.743 REF			0.108 REF		
L2	0.510 BSC			0.020 BSC		
L3	0.900	1.075	1.250	0.035	0.042	0.049
L4	0.600	0.800	1.000	0.024	0.031	0.039
$\theta$	0°	*	8°	0°	*	8°
$\theta 1$	5°	7°	9°	5°	7°	9°
$\theta 2$	5°	7°	9°	5°	7°	9°

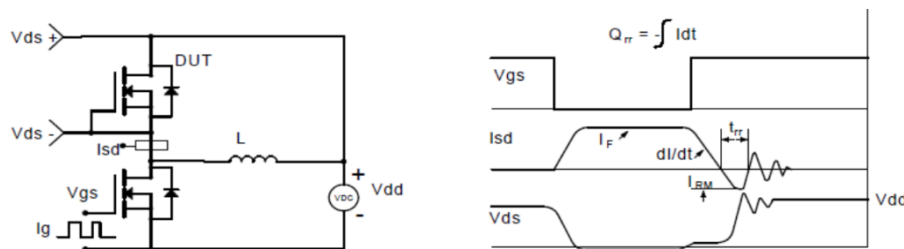
### Avalanche Test Circuit and Waveforms



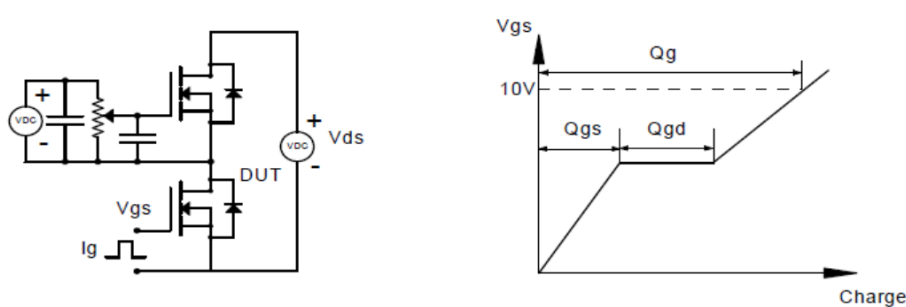
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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