

Features

- 40V/235A,
 $R_{DS(on)} = 1.4m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(on)} = 1.8m\Omega(Typ.)@V_{GS}=4.5V$
- Excellent $Q_G \times R_{DS(on)}$ product(FOM)
- SGT Technology
- 100% Avalanche Tested

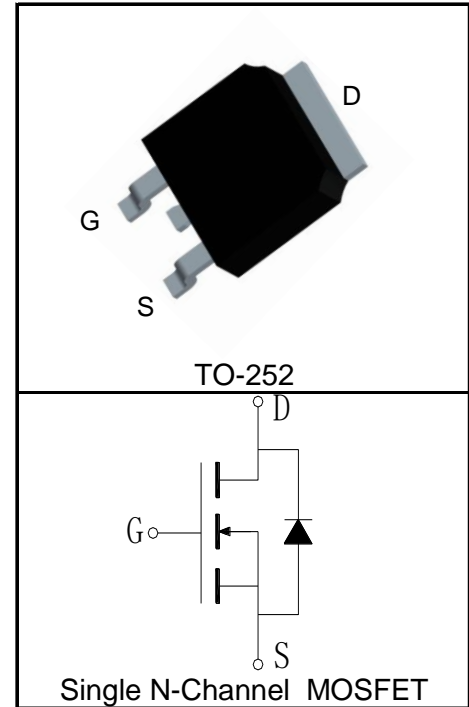
Applications

- DC/DC Converter
- High Frequency Switching and Synchronous Rectification



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 20	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 235	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 940	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=10V$)	$T_C=25^\circ\text{C}$ 235	A
		$T_C=100^\circ\text{C}$ 166	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 160	W
		$T_C=100^\circ\text{C}$ 80	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.94	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C/W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	441	mJ

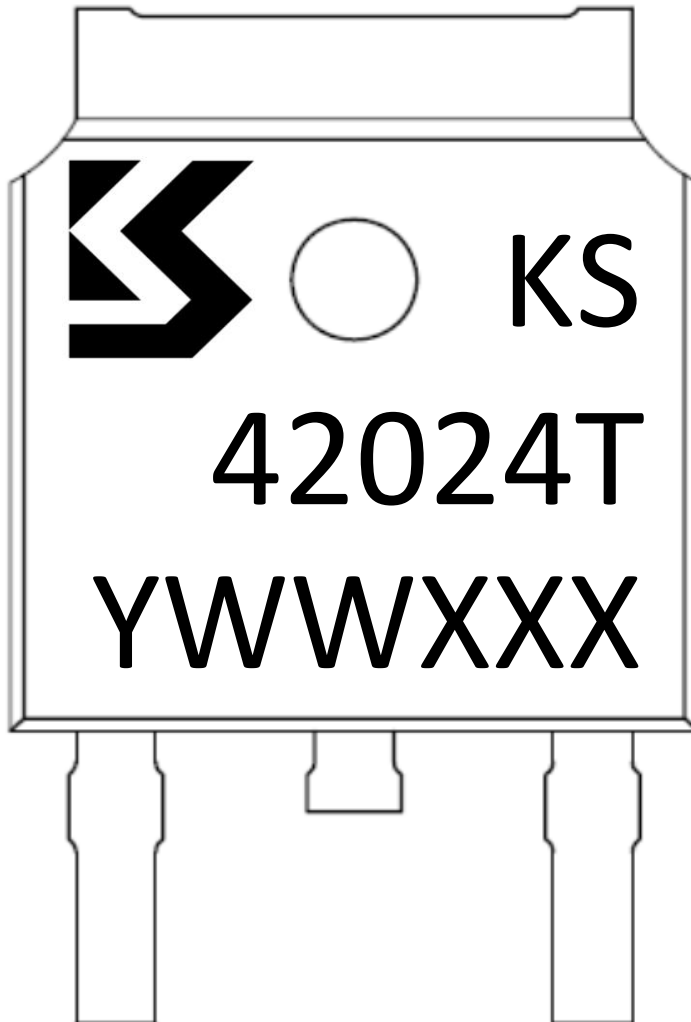
Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS42024DAT			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	40			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$			1	μA
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.1	1.6	2.3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=20A$		1.4	1.8	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=16A$		1.8	2.5	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$		0.76	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=20A, di_{SD}/dt=100A/\mu s$		46		ns
Q_{rr}	Reverse Recovery Charge			30		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.3		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Frequency=1.0MHz		5400		pF
C_{oss}	Output Capacitance			1795		
C_{rss}	Reverse Transfer Capacitance			75		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, I_{DS}=20A,$ $V_{GEN}=10V, R_G=3\Omega$		18		ns
t_r	Turn-on Rise Time			53		
$t_{d(OFF)}$	Turn-off Delay Time			99		
t_f	Turn-off Fall Time			61		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V,$ $I_{DS}=20A$		100		nC
Q_{gs}	Gate-Source Charge			18		
Q_{gd}	Gate-Drain Charge			27		

- 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 $T_{Jmax}, I_{AS}=42A, L=0.5\text{mH}, V_{DD}=24V, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$, 100% tested and guaranteed.
 - 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
KS42024DAT	TO-252	Tape&Reel	2500	13"	16mm

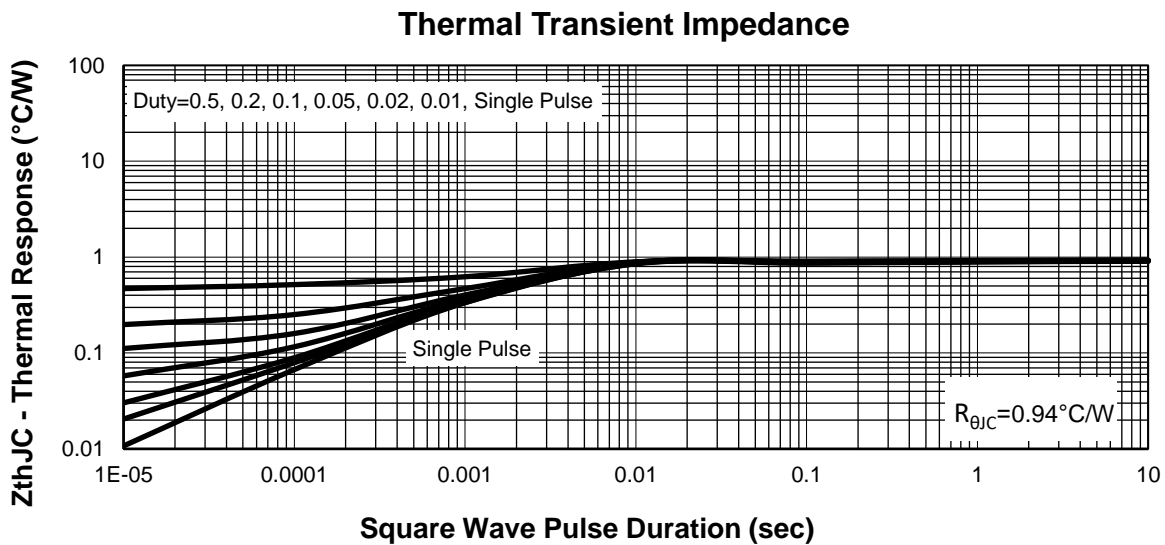
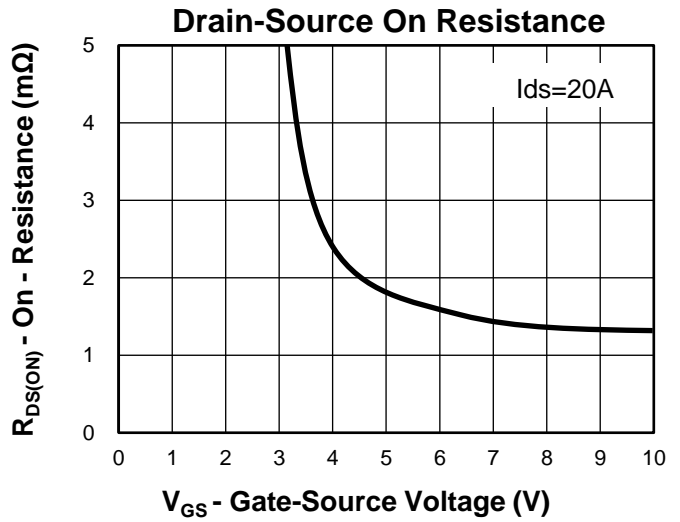
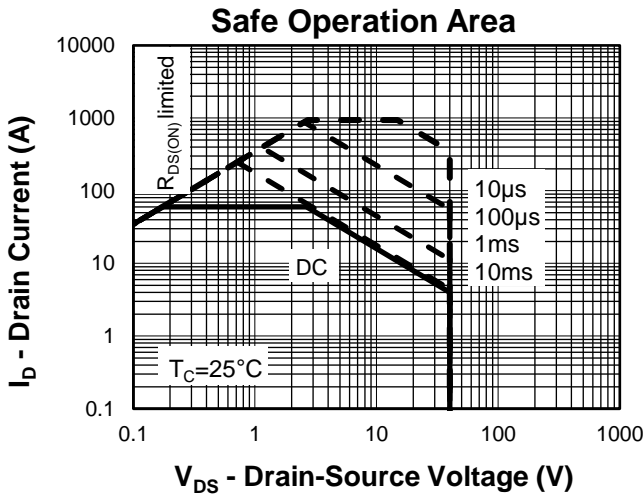
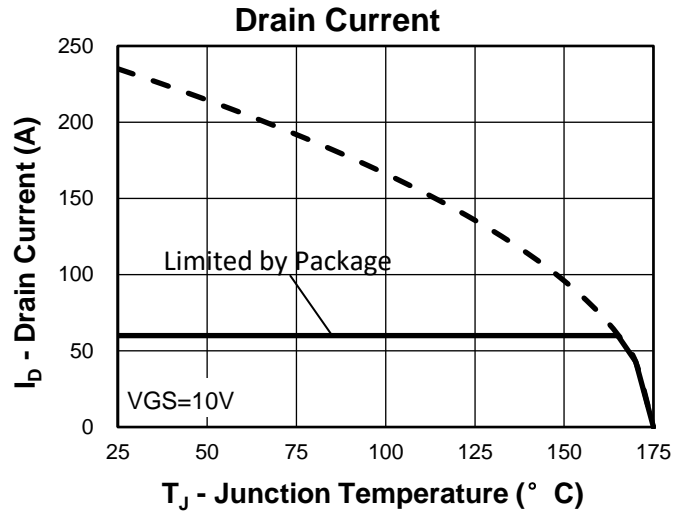
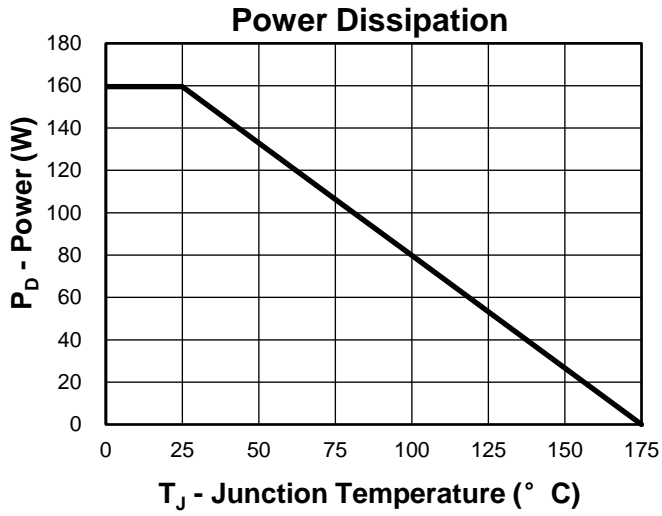


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

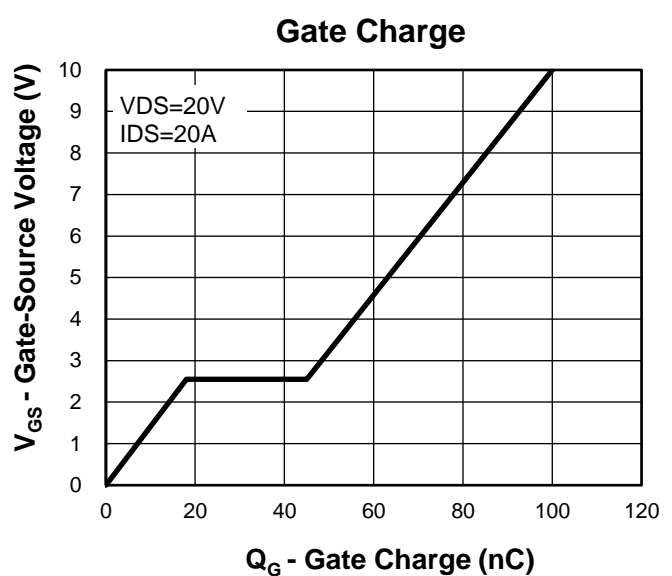
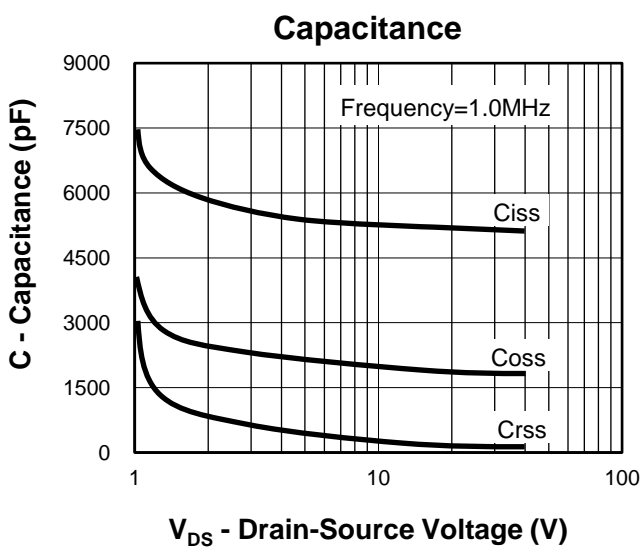
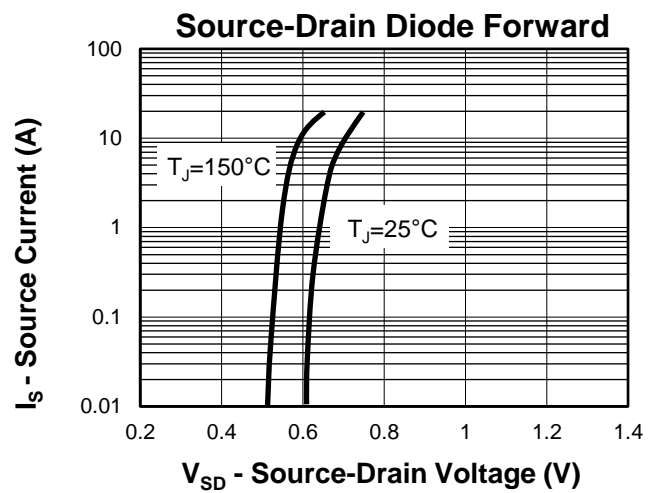
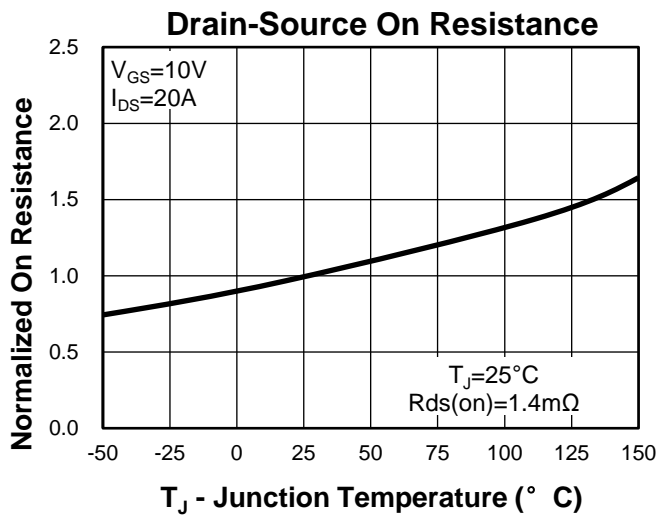
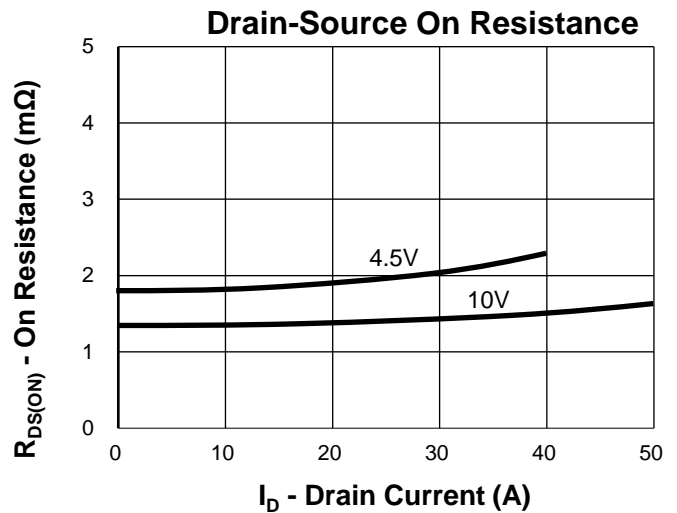
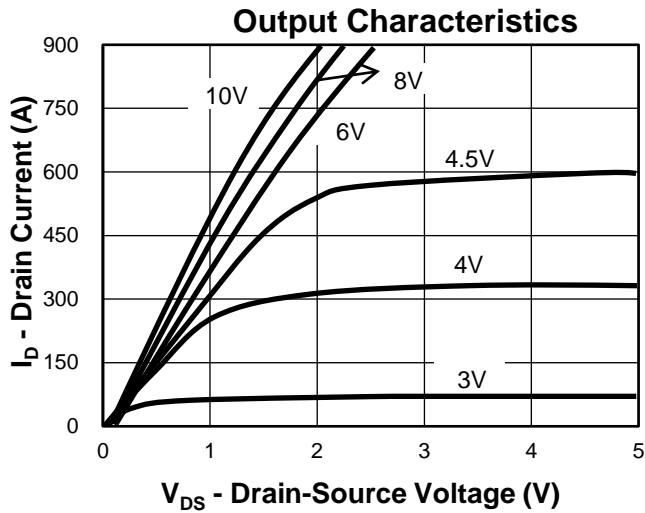
2nd Line: Part Number(42024T)

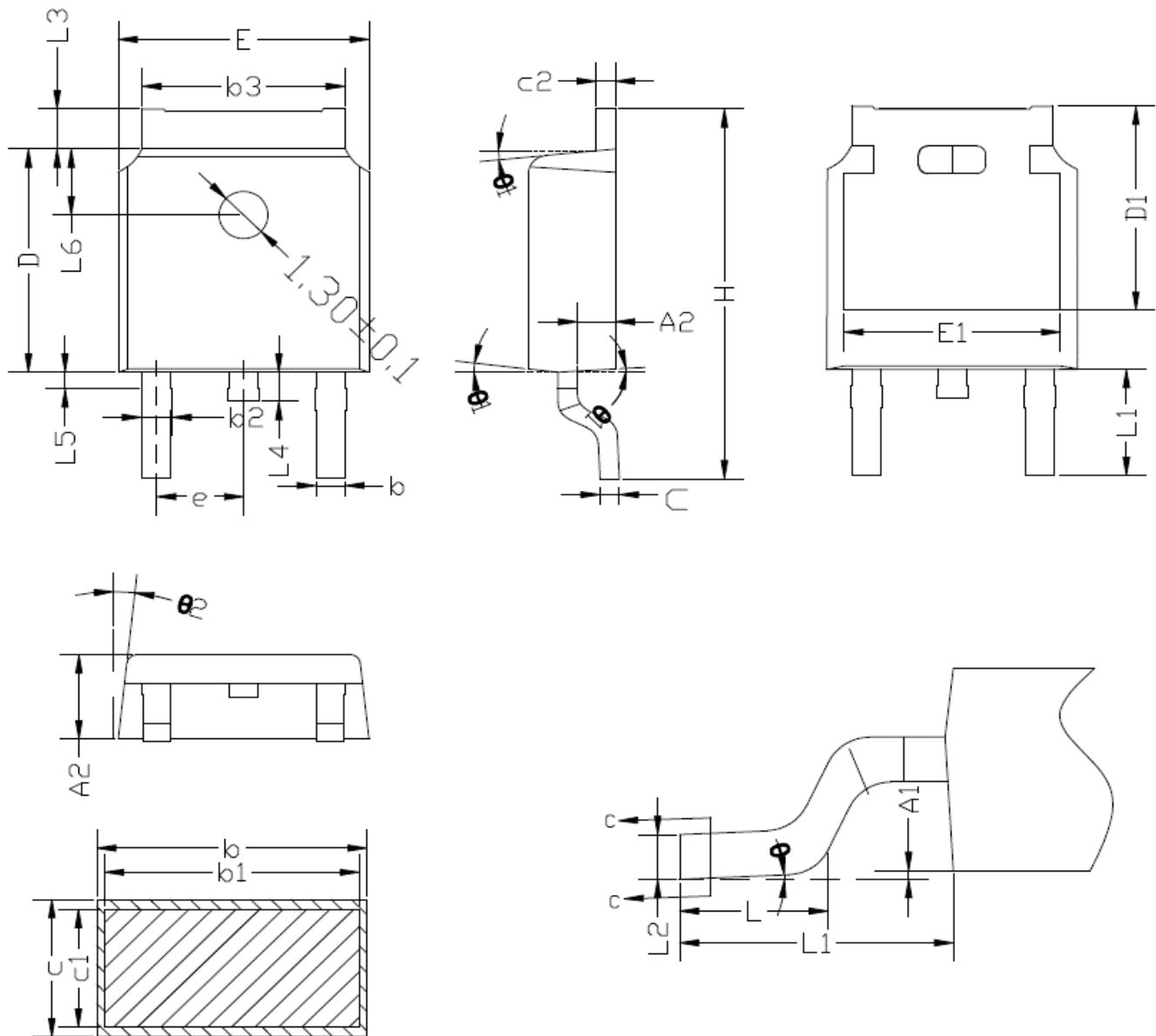
3rd Line: Lot Number(YWWXXX)

Typical Characteristics



Typical Characteristics



Package Information
TO-252


SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	2.20	2.30	2.40	0.087	0.091	0.094	D1	5.25	5.35	5.45	0.207	0.211	0.215
A1	0.00	*	0.15	0.000	*	0.006	E	6.50	6.60	6.70	0.256	0.260	0.264
A2	0.90	1.00	1.10	0.035	0.039	0.043	E1	5.10	5.13	5.16	0.201	0.202	0.203
b	0.72	*	0.85	0.028	*	0.033	e	2.28REF			0.09REF		
b1	0.71	0.76	0.81	0.028	0.030	0.032	H	9.80	10.10	10.40	0.386	0.398	0.409
b2	0.72	*	0.90	0.028	*	0.035	L	1.40	1.50	2.60	0.055	0.059	0.102
b3	5.13	5.33	5.46	0.202	0.210	0.215	L1	2.90REF			0.11REF		
c	0.47	0.51	0.54	0.019	0.020	0.021	L2	0.51REF			0.02REF		
c1	0.46	0.50	0.53	0.018	0.020	0.021	L3	0.90	*	1.25	0.035	*	0.049
c2	0.47	0.51	0.54	0.019	0.020	0.021	θ	1°	5°	7°	1°	5°	7°
D	6.00	6.10	6.20	0.236	0.240	0.244	θ_1	5°	7°	9°	5°	7°	9°

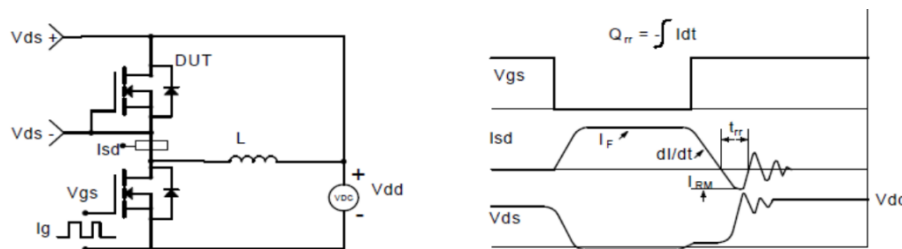
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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