

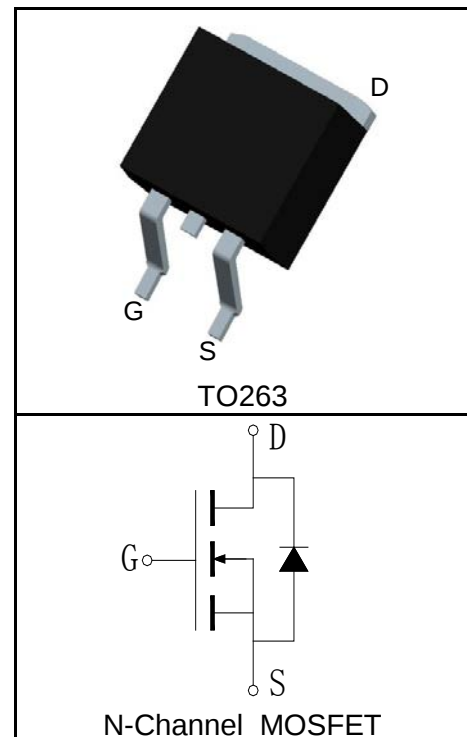
Features

- 80V/100A,
 $R_{DS(ON)} = 5.5m\Omega$ (Typ.) @ $V_{GS}=10V$
- Ultra Low On-Resistance
- Exceptional dv/dt capability
- Fast Switching and Fully Avalanche Rated
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free and Green Available

Applications

- High Current Switching Applications
- Inverter Systems

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		80	V
V _{GSS}	Gate-Source Voltage		±25	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	T _C =25°C	100	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _C =25°C	400	A
I _D ^②	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	100	A
		T _C =100°C	71	
P _D	Maximum Power Dissipation	T _C =25°C	188	W
		T _C =100°C	94	
R _{θJC}	Thermal Resistance-Junction to Case		0.8	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^③	Avalanche Energy, Single Pulsed		225	mJ

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

Symbol	Parameter	Test Condition	RU80100S			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	80			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V, V _{GS} =0V			1	μA
			T _J =125°C		30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±25V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =40A		5.5	7.5	mΩ
Diode Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _{SD} =40A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =40A, dI _{SD} /dt=100A/μs		51		ns
Q _{rr}	Reverse Recovery Charge			96		nC
Dynamic Characteristics ^⑤						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz		1.6		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Frequency=1.0MHz		3600		pF
C _{oss}	Output Capacitance			470		
C _{rss}	Reverse Transfer Capacitance			340		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _L =0.8Ω, I _{DS} =40A, V _{GEN} =10V, R _G =6Ω		15		ns
t _r	Turn-on Rise Time			18		
t _{d(OFF)}	Turn-off Delay Time			42		
t _f	Turn-off Fall Time			64		
Gate Charge Characteristics ^⑤						
Q _g	Total Gate Charge	V _{DS} =64V, V _{GS} =10V, I _{DS} =40A		78		nC
Q _{gs}	Gate-Source Charge			15		
Q _{gd}	Gate-Drain Charge			27		

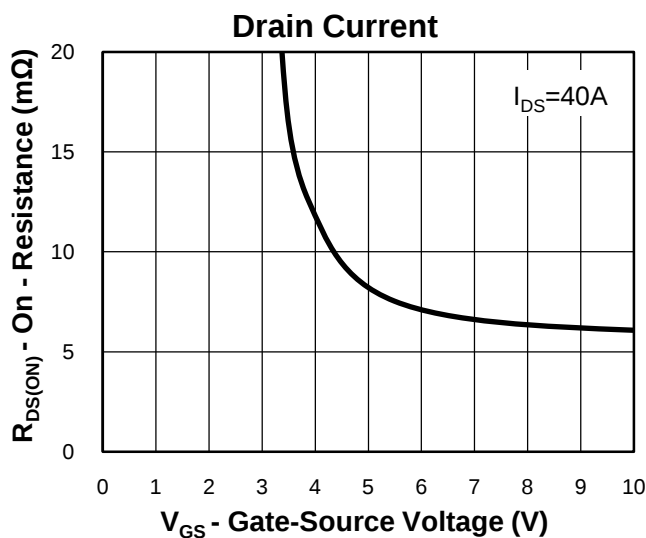
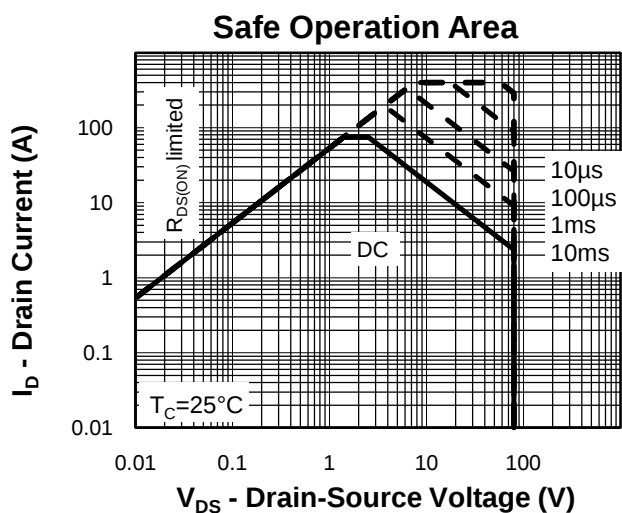
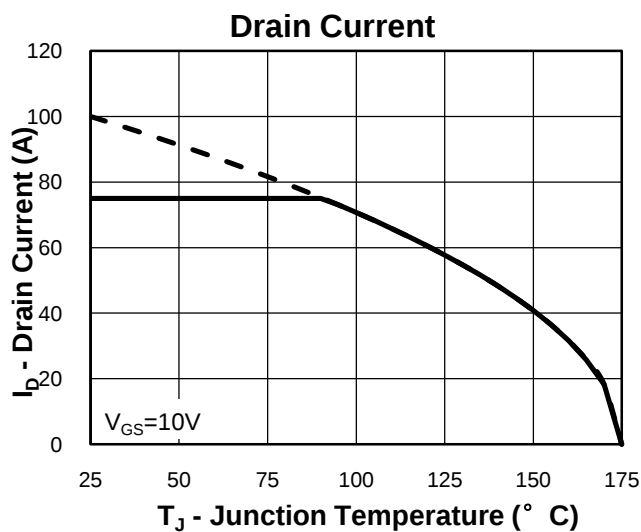
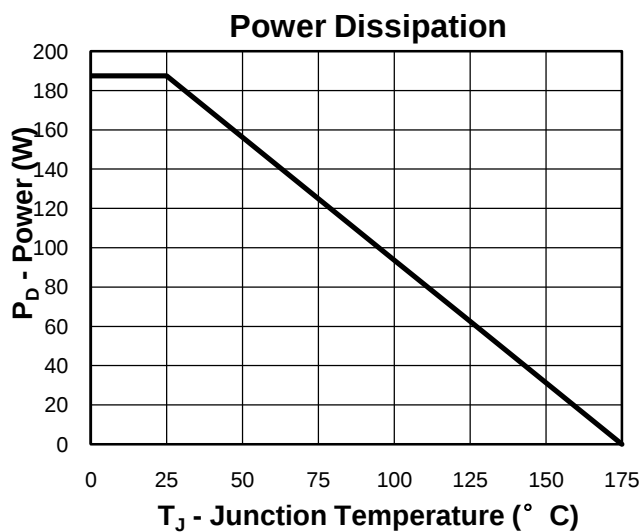
Notes:

- ① Pulse width limited by safe operating area.
- ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.
- ③ Limited by T_{Jmax} , $I_{AS}=30A$, $V_{DD}=48V$, $R_G=50\Omega$, 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.

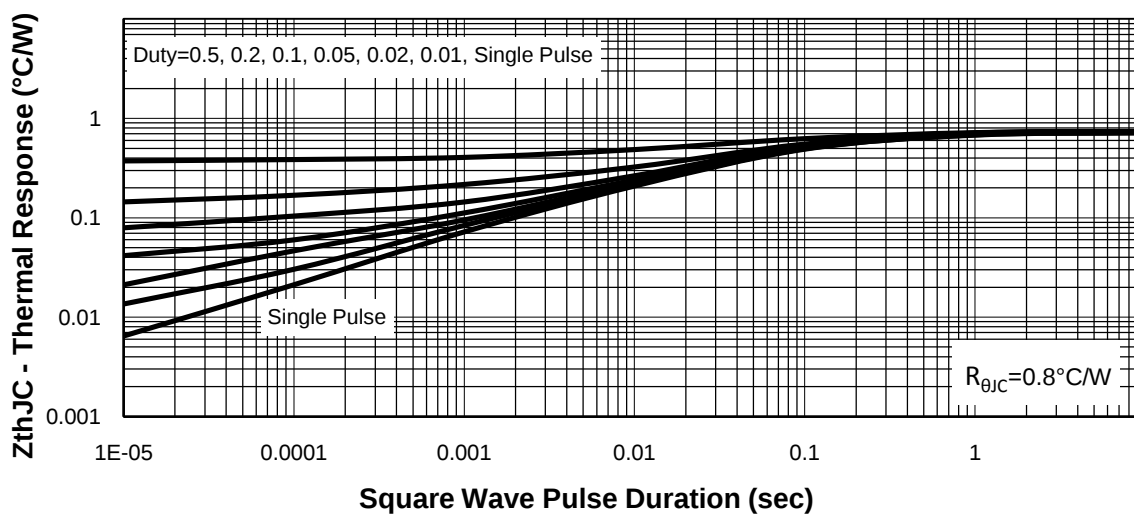
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU80100S	RU80100S	TO263	Tube	50	-	-

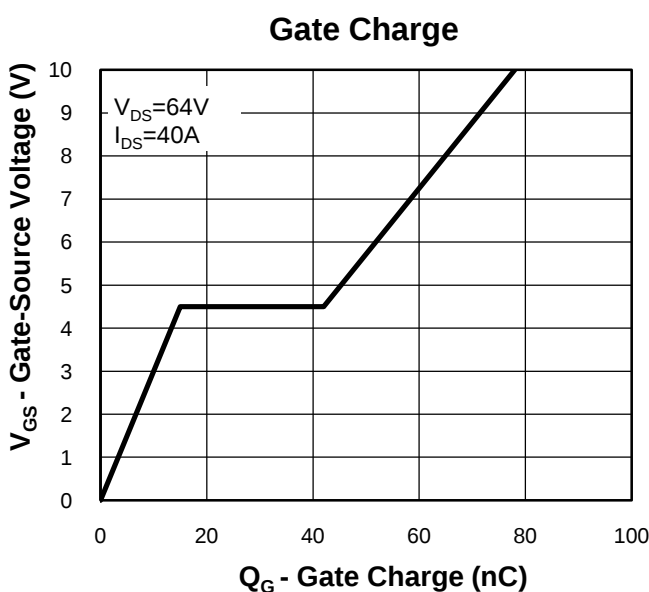
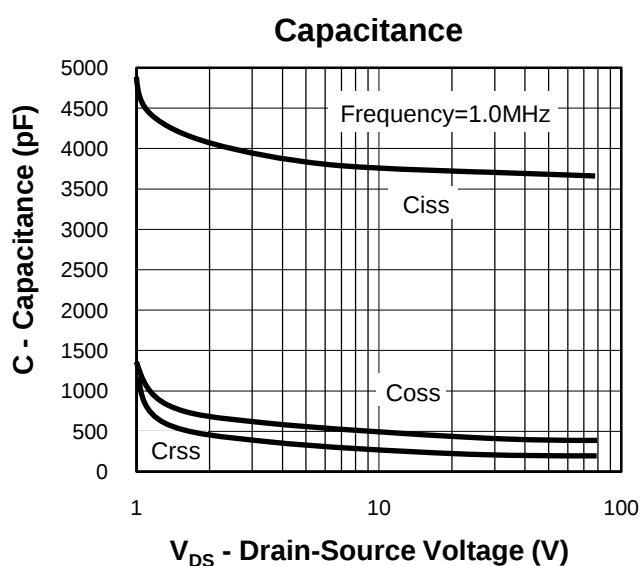
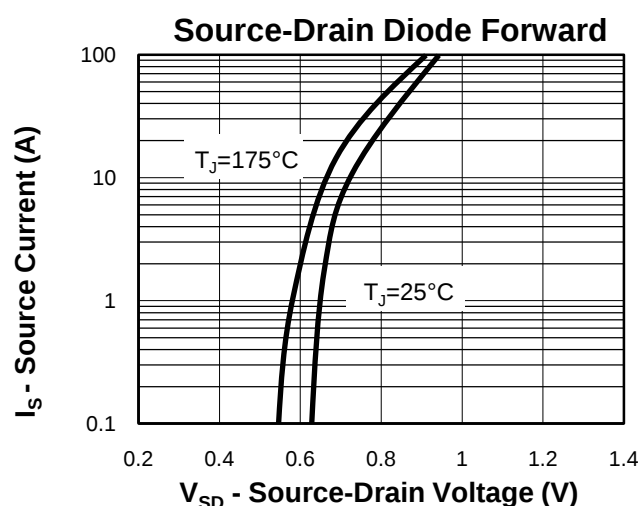
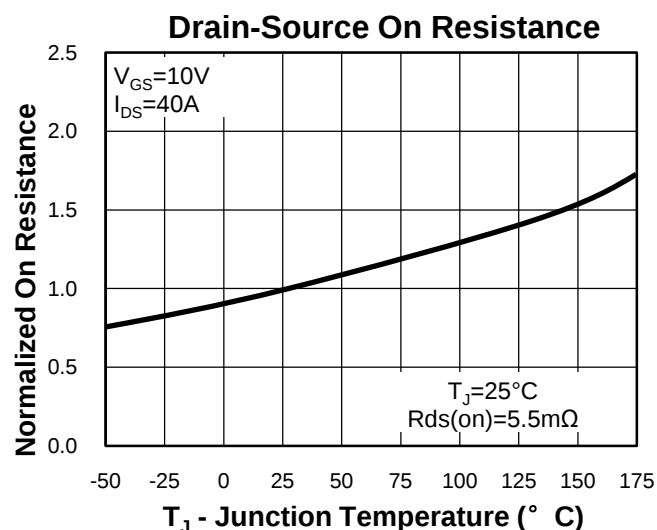
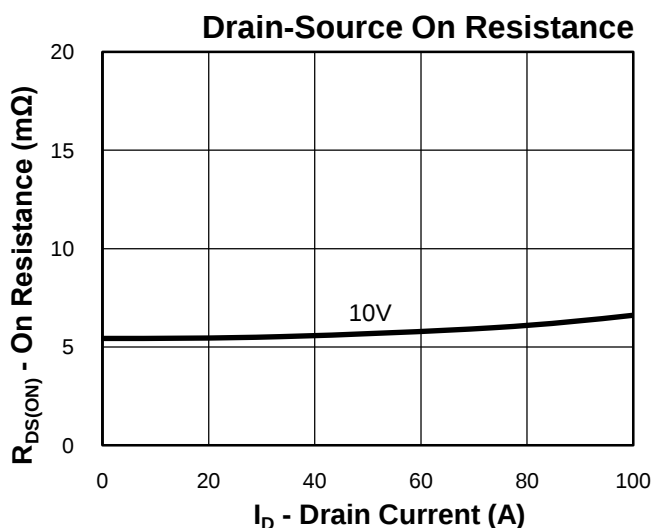
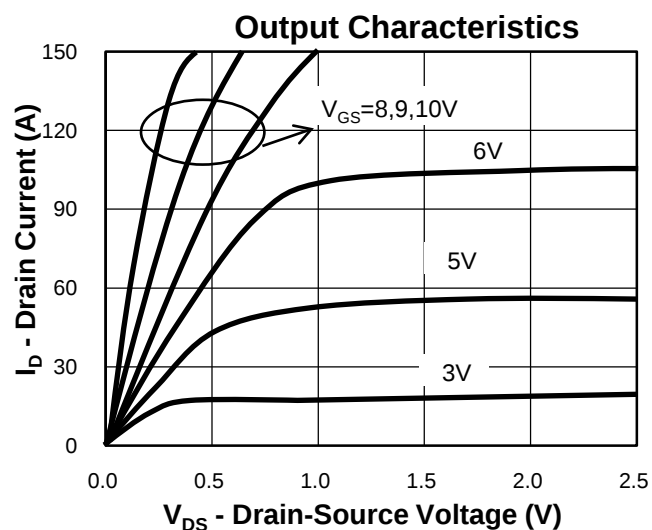
Typical Characteristics



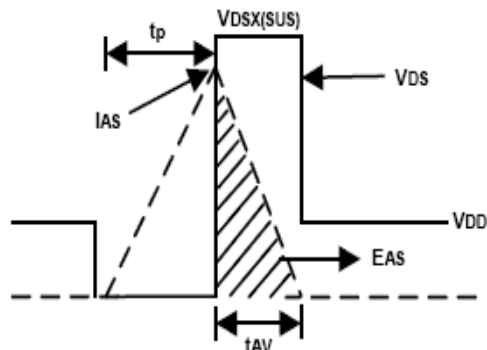
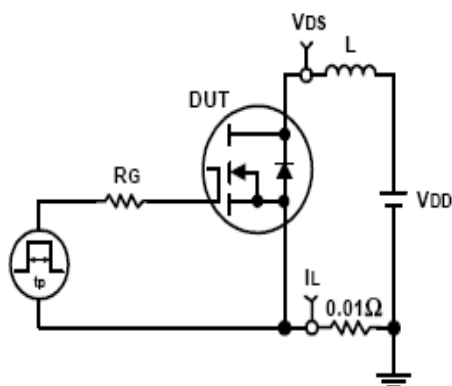
Thermal Transient Impedance



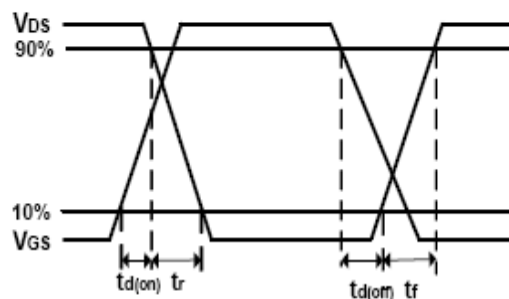
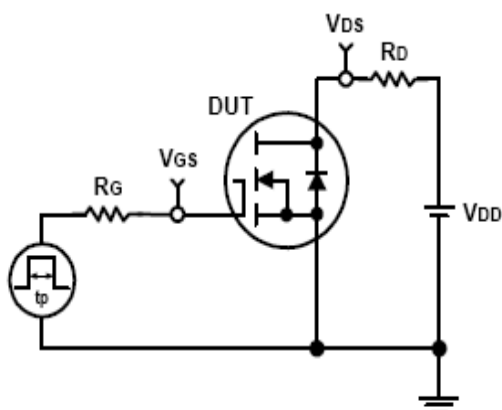
Typical Characteristics



Avalanche Test Circuit and Waveforms

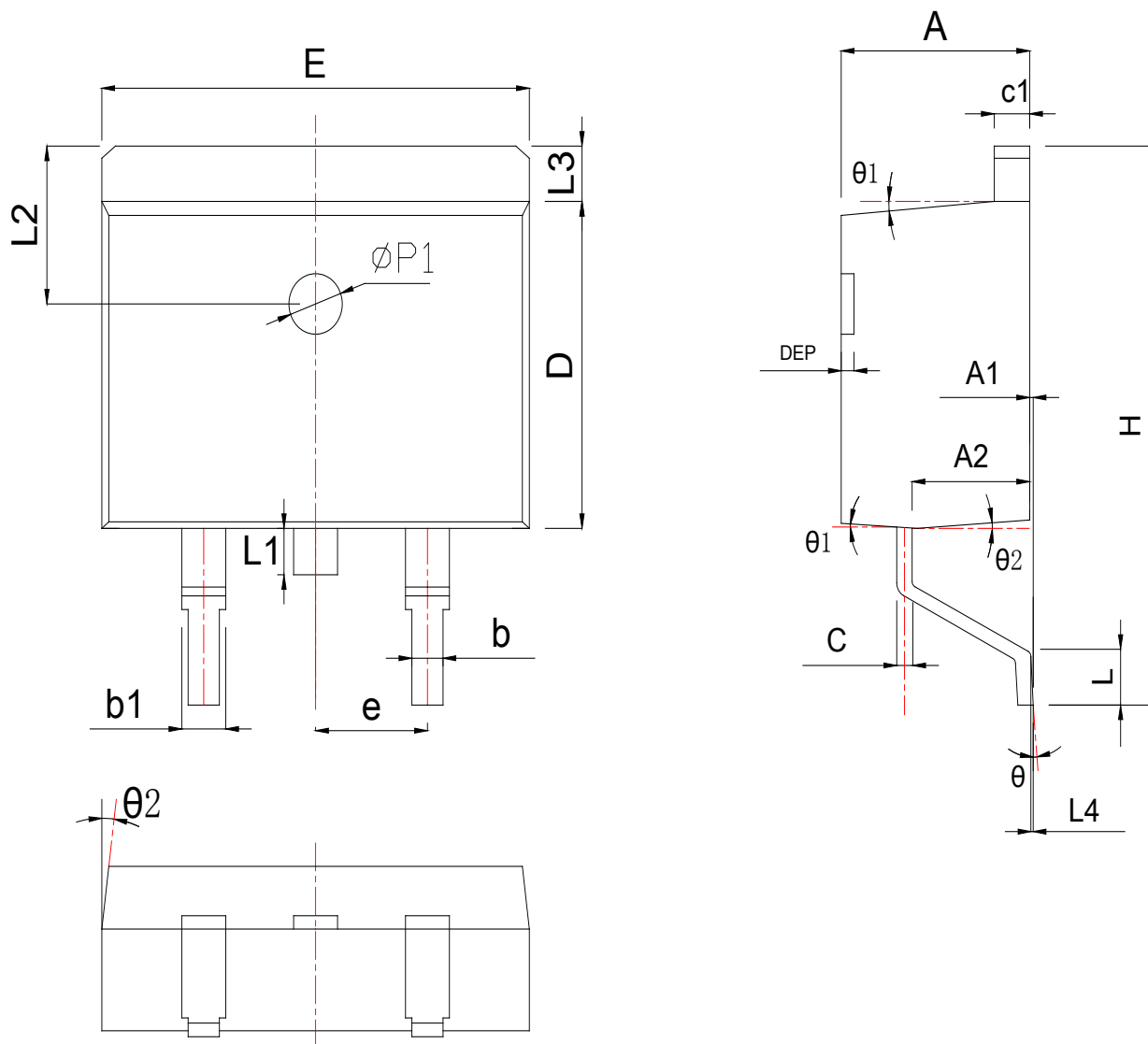


Switching Time Test Circuit and Waveforms



Package Information

TO263



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.55	4.70	0.173	0.179	0.185	L	2.00	2.30	2.60	0.079	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	0.77	*	0.90	0.030		0.035	L4	0.25 BSC			0.01 BSC		
b1	1.23	*	1.36	0.048		0.054	L2	2.50 REF			0.098 REF		
c	0.34	*	0.47	0.013		0.019	θ	0°	*	8°	0°	*	8°
c1	1.22	*	1.32	0.048		0.052	θ_1	5°	7°	9°	5°	7°	9°
D	8.60	8.70	8.80	0.339	0.343	0.346	θ_2	1°	3°	5°	1°	3°	5°
E	10.00	10.13	10.26	0.394	0.399	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	15.50	0.579	0.594	0.610							

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