

1. Description

These N-channel enhancement mode power mosfets used advanced trench technology design, provided excellent $R_{DS(ON)}$ and low gate charge. Which accords with the RoHS standard.

2. Features

- $V_{DS}=60V$, $I_D=25A$
- $R_{DS(ON)}$, 23 mΩ(Typ) @ $V_{GS}=10V$
- $R_{DS(ON)}$, 30 mΩ(Typ) @ $V_{GS}=4.5V$
- Fast Switching
- Low ON Resistance ($R_{dson} \leq 29m\Omega$)
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

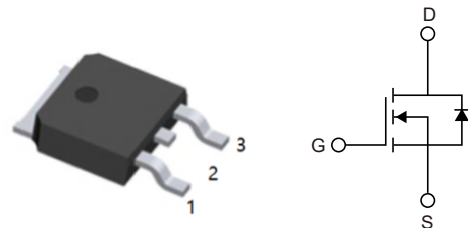
3. Application

- Power switch circuit of adaptor and charger
- LED backlight driver
- Synchronousrectification

4. Pinning Information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

TO-252(DPAK)
top view





5. Absolute Maximum Ratings $T_A = 25^\circ\text{C}$

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	25	A
	$T_C = 100^\circ\text{C}$		17.5	
Pulsed Drain Current ¹⁾		I_{DM}	100	
Single Pulse Avalanche Energy ²⁾		E_{AS}	56.2	mJ
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	36.2	W
Storage Temperature Range		T_{STG}	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range		T_J	-55 to 150	$^\circ\text{C}$

5. Thermal Resistance Rating

Parameter	Symbol	Typ	Max	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		3.45	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$		111.5	$^\circ\text{C/W}$



6. Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTIC						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _{DS} =250μA	1	1.5	2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =19A		23	29	mΩ
		V _{GS} =4.5V, I _{DS} =19A		30	38	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHz		939		pF
Output Capacitance	C _{oss}			73.5		pF
Reverse Transfer Capacitance	C _{rss}			52.7		pF
Gate Resitance	R _g	V _{DD} =0V, V _{GS} =0V, f=1MHz		1.9		Ω
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =30V R _{GEN} =3Ω, I _D =20A		8.4		ns
Rise Time	t _r			8.5		ns
Turn-Off Delay Time	t _{D(off)}			35.4		ns
Fall Time	t _f			4.8		ns
Total Gate Charge	Q _g	V _{DS} =30V, I _{DS} =20A, V _{GS} =10V		21.2		nC
Gate to Source Gate Charge	Q _{gs}			3.6		nC
Gate to Drain“Miller”Charge	Q _{gd}			5.5		nC



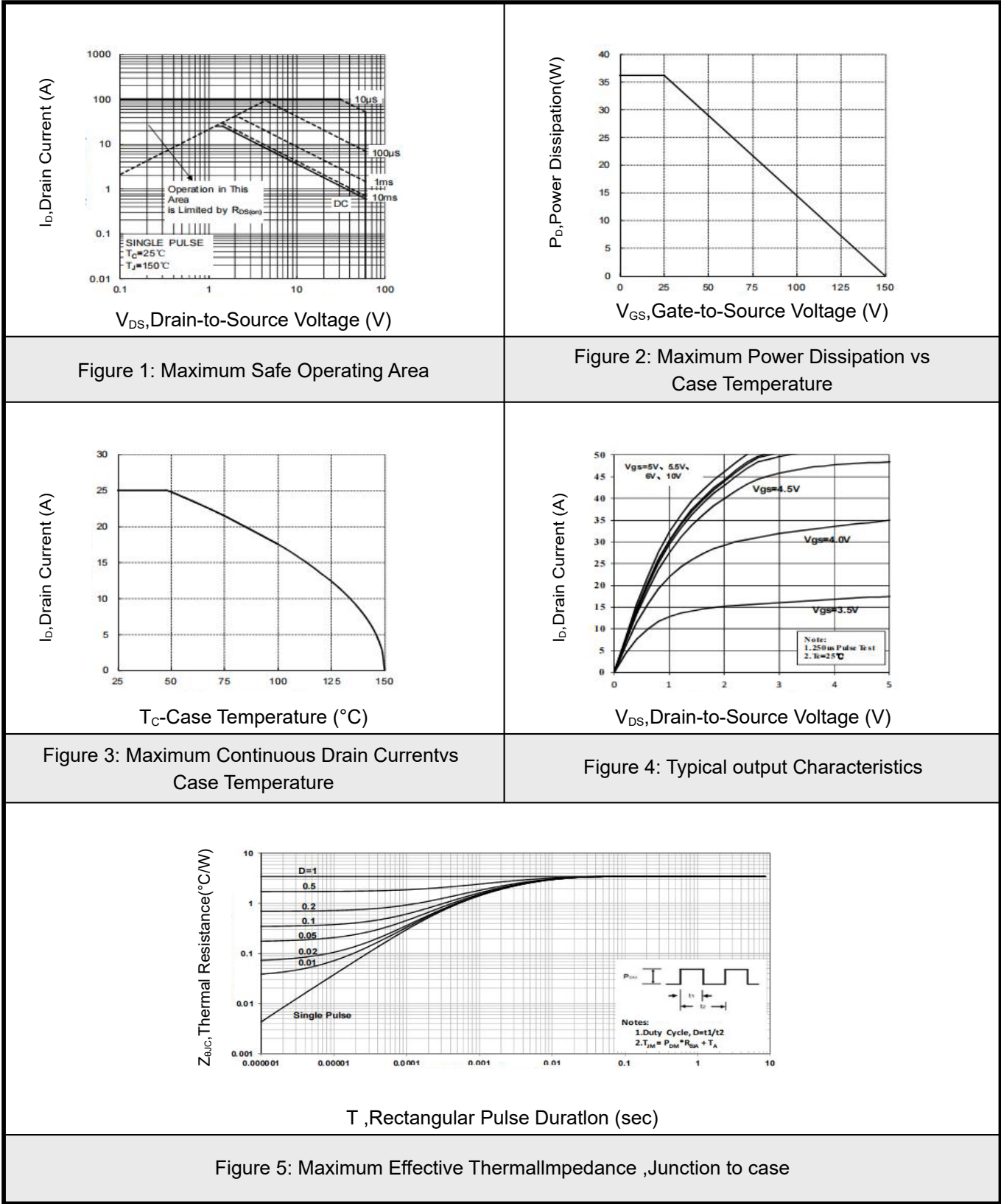
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{DS}=20A$			1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}C, I_F=20A$		18.8		nS
Reverse Recovery Charge	Q_{rr}	$di/dt=100A/\mu s$		13.4		nC

Notes:

- 1) Repetitive rating; pulse width limited by maximum junction temperature .
- 2) $L=0.5mH, V_{DD}=30V, I_{AS}=15A$ Start $T_J=25^{\circ}C$.
- 3) Recommend soldering temperature defined by IPC/JEDEC J-STD 020.

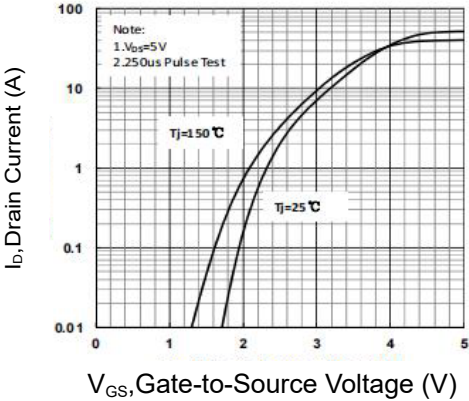
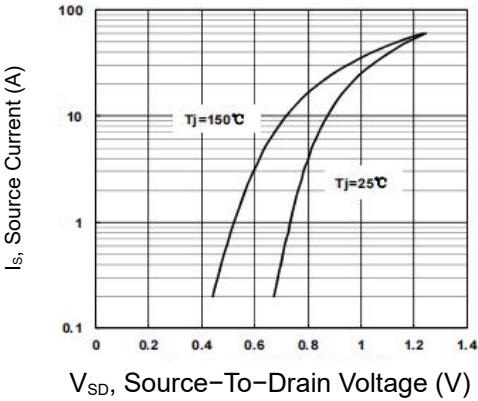
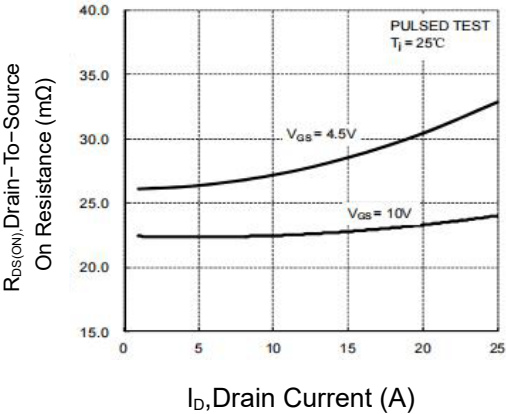
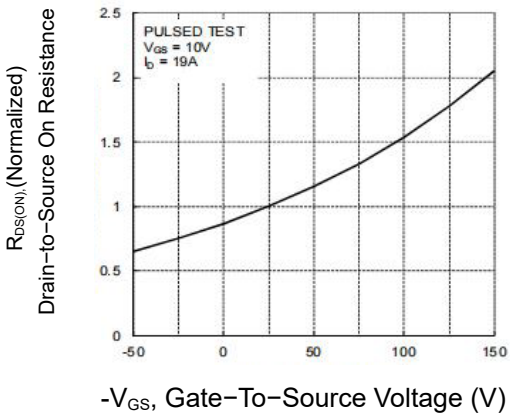
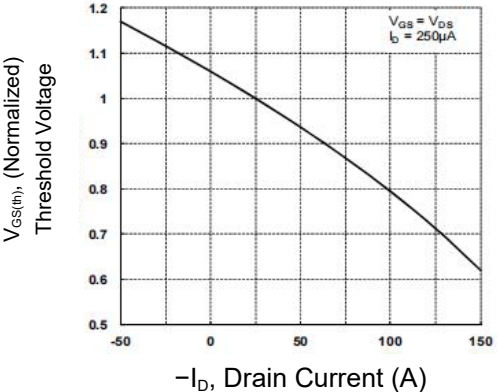
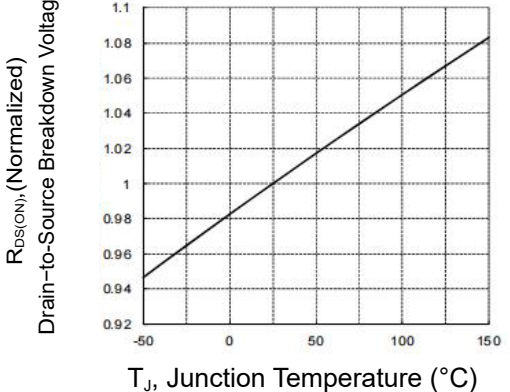


7.1 Typical Characteristics



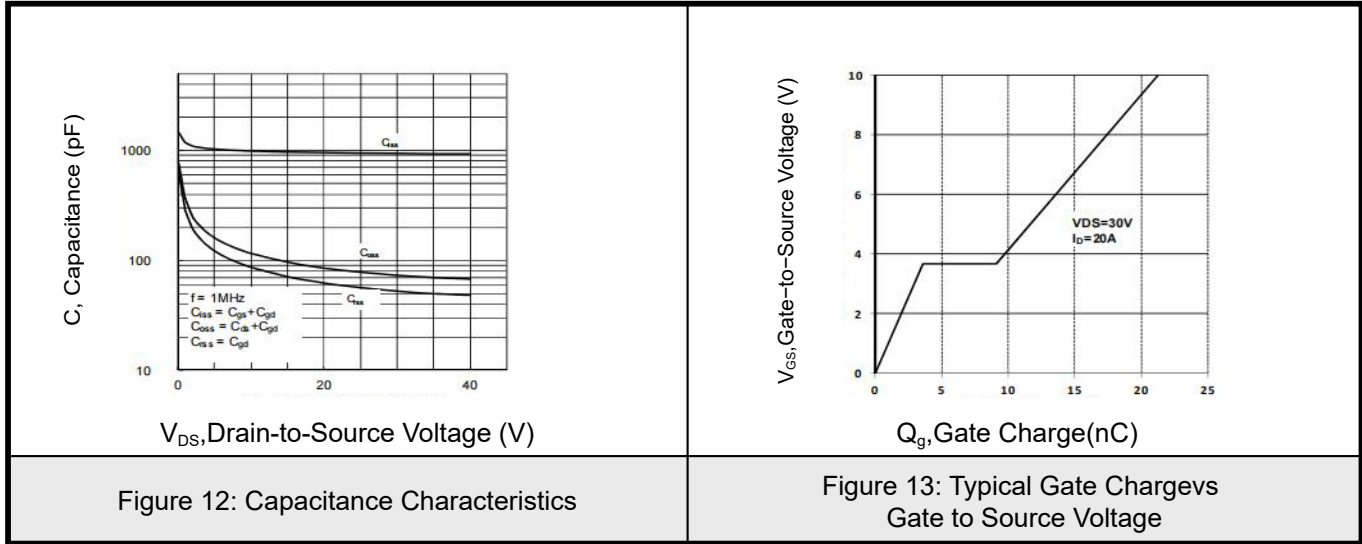


7.2 Typical Characteristics

	
Figure 6: Typical Transfer Characteristics	Figure 7: Typical Body Diode Transfer Characteristics
	
Figure 8: Drain-to-Source On Resistance vs Drain Current	Figure 9: Normalized On Resistance vs Junction Temperature
	
Figure 10: Normalized Threshold Voltage vs Junction Temperature	Figure 11: Normalized Breakdown Voltage vs Junction Temperature



7.3 Typical Characteristics





8. Test Circuit and Waveform

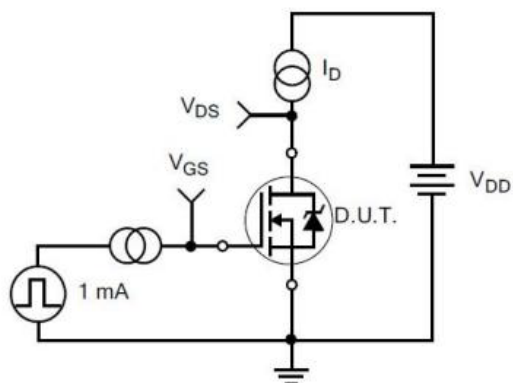


Figure 14: Gate Charge Test Circuit

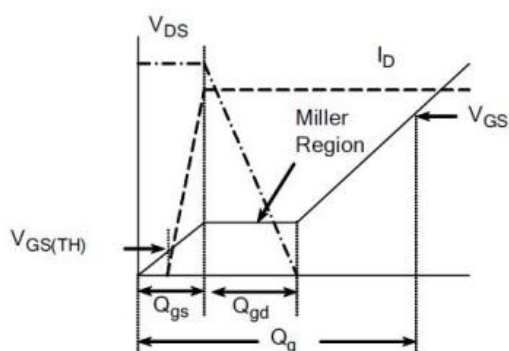


Figure 15: Gate Charge Waveforms

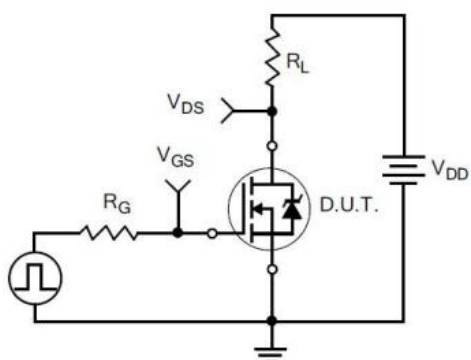


Figure 16: Resistive Switching Test Circuit

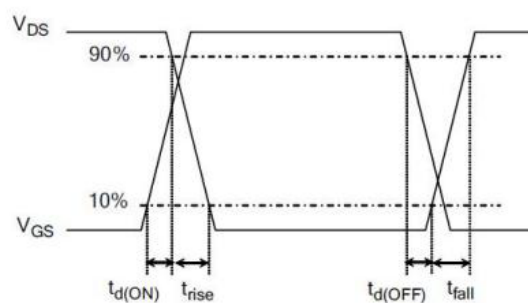


Figure 17: Resistive Switching Waveforms

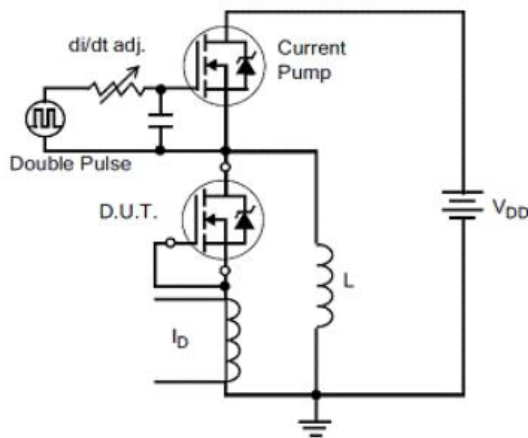


Figure 18: Diode Reverse Recovery Test Circuit

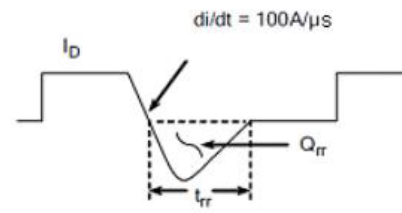


Figure 19: Diode Reverse Recovery Waveform

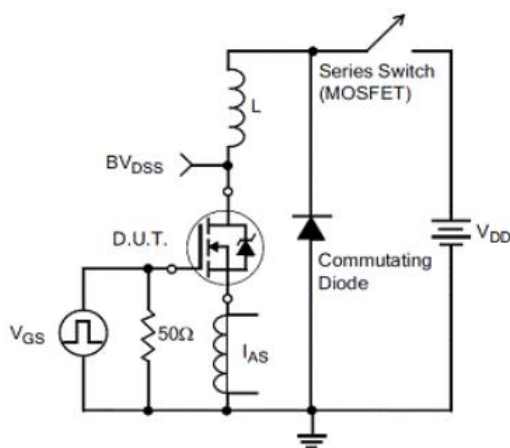


Figure 20: Unclamped Inductive Switching Test Circuit

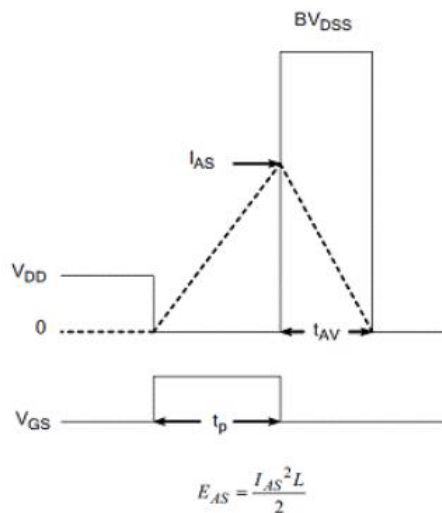
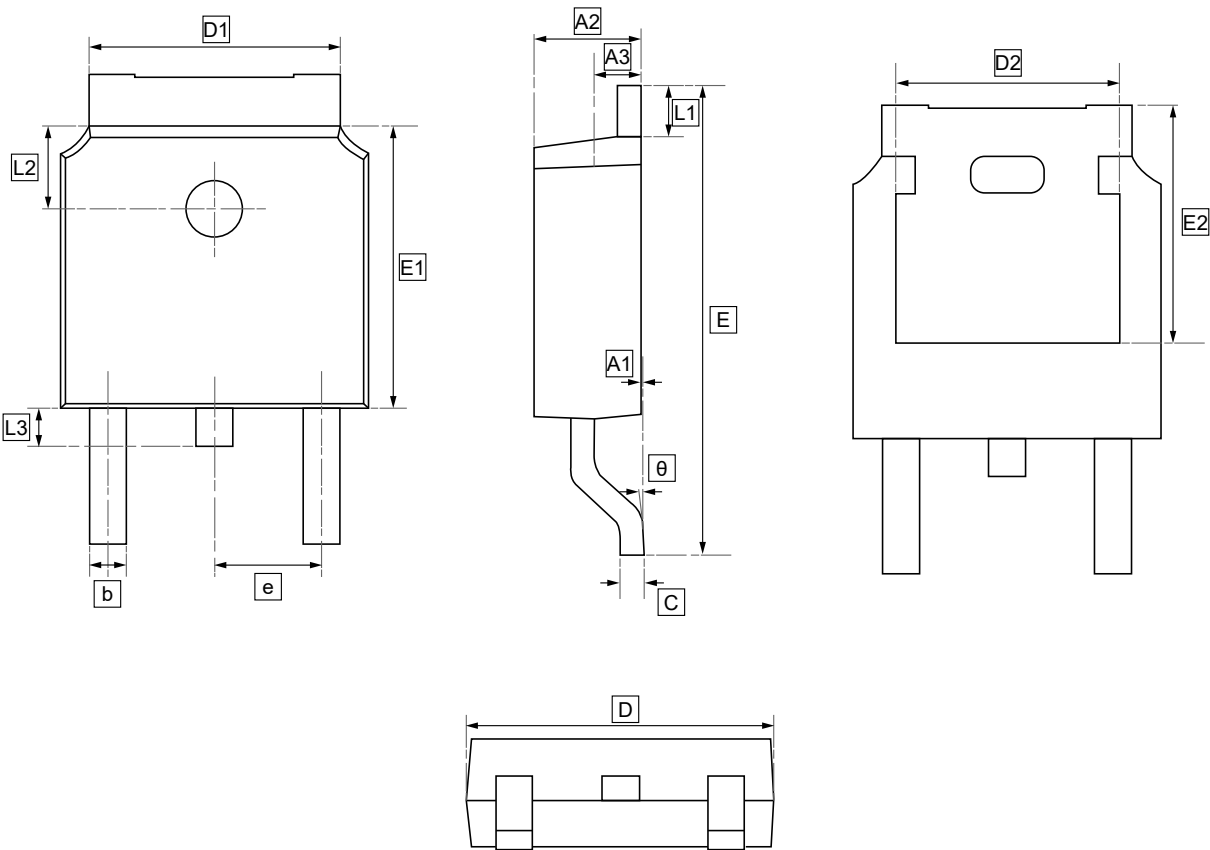


Figure 21: Unclamped Inductive Switching Waveform



8.TO-252 Package Outline Dimensions

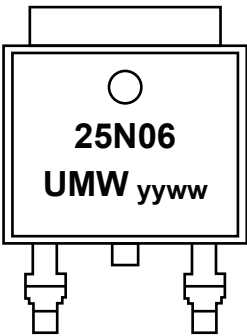


DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286 BSC	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38		1.27	1.90	1.00	8.00



9.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW 25N06	TO-252	2500	Tape and reel



10.Disclaimer

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