Features

- Low FOM $R_{DS(on)} \times Q_{gd}$
- Easy to use/drive
- RoHS compliant

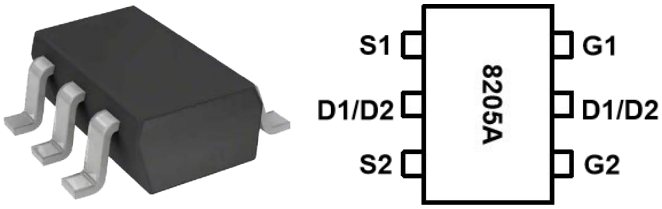
Applications

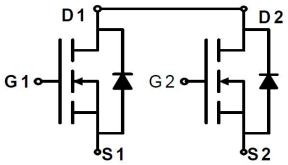
- Portable Equipment
- Battery Powered System

Description

N-Channel Power MOSFET designed by LX -Micro Semiconductor Company, according to the advanced Trench Technology. This devices provide an excellent gate charge and RDS(on), which leads to extremely communication and conduction losses. Low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

SOT23-6





Key Performance Parameters

Parameter	Value	Unit
$V_{DS@\ TA=25℃}$	20	V
$R_{DS(on),max@4.5V}$	24	mΩ
$R_{DS(on),max@2.5V}$	33	mΩ
$Q_{g,typ}$	7	nC
$I_{D@TA=25℃}$	6	A
$I_{D,pulse}$	24	A
$E_{AS1)}$	6.3	mJ

Device Marking and Package Information

Device	Package	Marking
LX8205H	SOT23-6	8205A

Absolute Maximum Ratings TA = 25℃, unless otherwise noted

Parameter		Symbol	Values	Unit
Drain-Source Voltage(V_{GS}=0V)		V_{DS}	20	V
Continuous Drain Current2)	T_A = 25ºC	I_D	6	A
	T_A = 100ºC		4.1	
Pulsed Drain Current3)		$I_{D,pulse}$	24	A
Gate-Source Voltage		V_{GS}	±12	V
Single Pulse Avalanche Energy		E_{AS}	6.3	mJ
Power Dissipation		P_D	1.3	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	ºC

Thermal Resistance

Parameter	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	90	℃/W

Notes

1) L=0.5mH, VDD=10V, Start TJ=25℃.

2) Limited by maximum junction temperature.

3) Repetitive Rating: Pulse width limited by maximum junction temperature.

Electrical Characteristics T_J = 25℃, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
		V_{DS} = 20V V_{GS} = 0V, T_J = 125ºC	--	--	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS} = ±12V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.5	0.75	1.0	V
Drain-Source On-State-Resistance	$R_{DS(on)}$	V_{GS} =4.5V, I_D = 6A	--	18.7	24	mΩ
		V_{GS} = 2.5V, I_D = 3.5A	--	24.7	33	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V f = 1.0MHz	--	365	--	pF
Output Capacitance	C_{oss}		--	65	--	
Reverse Transfer Capacitance	C_{rss}		--	60	--	
Total Gate Charge	Q_g	V_{DS} = 10V, I_D = 6A V_{GS} = 4.5V	--	7	--	nC
Gate-Source Charge	Q_{gs}		--	1.1	--	
Gate-Drain Charge	Q_{gd}		--	2	--	
Gate Plateau Voltage	$V_{Plateau}$		--	1.7	--	V
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 10V, V_{GS} = 4.5V R_G = 3Ω, I_D = 6A	--	8	--	ns
Turn-on Rise Time	t_r		--	11	--	
Turn-off Delay Time	$t_{d(off)}$		--	32	--	
Turn-off Fall Time	t_f		--	27	--	
Drain-Source Body Diode Characteristics						
Body Diode Forward Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 6A V_{GS} = 0V	--	--	1.2	V
Continuous Diode Forward Current	I_S		--	--	6	A
Reverse Recovery Time	t_{rr}	I_F = 6A, di_F/dt = 100A/μs	--	21	--	ns
Reverse Recovery Charge	Q_{rr}		--	9.7	--	nC

Typical Characteristics T_J = 25℃, unless otherwise noted

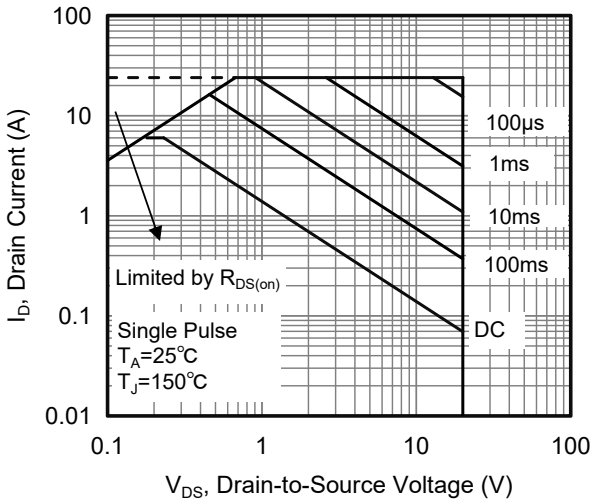


Figure 1. Maximum Safe Operating Area

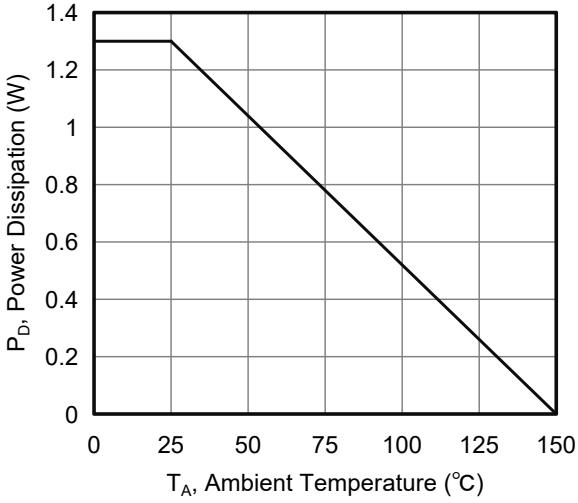


Figure 2. Maximum Power Dissipation vs Ambient Temperature

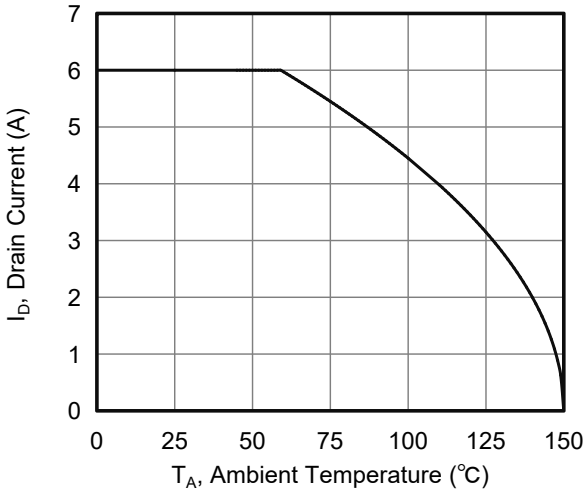


Figure 3. Maximum Continuous Drain Current vs Ambient Temperature

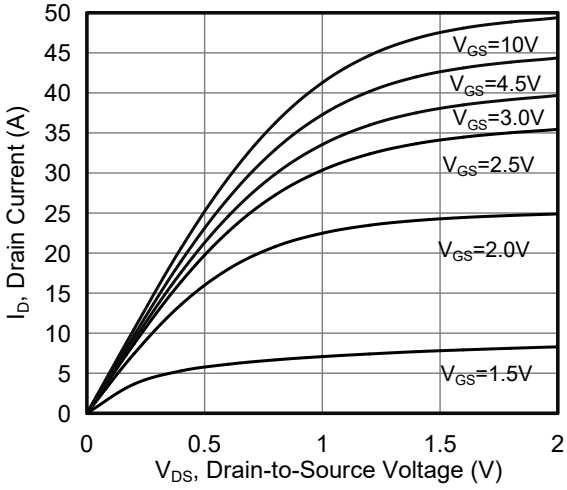


Figure 4. Typical output Characteristics

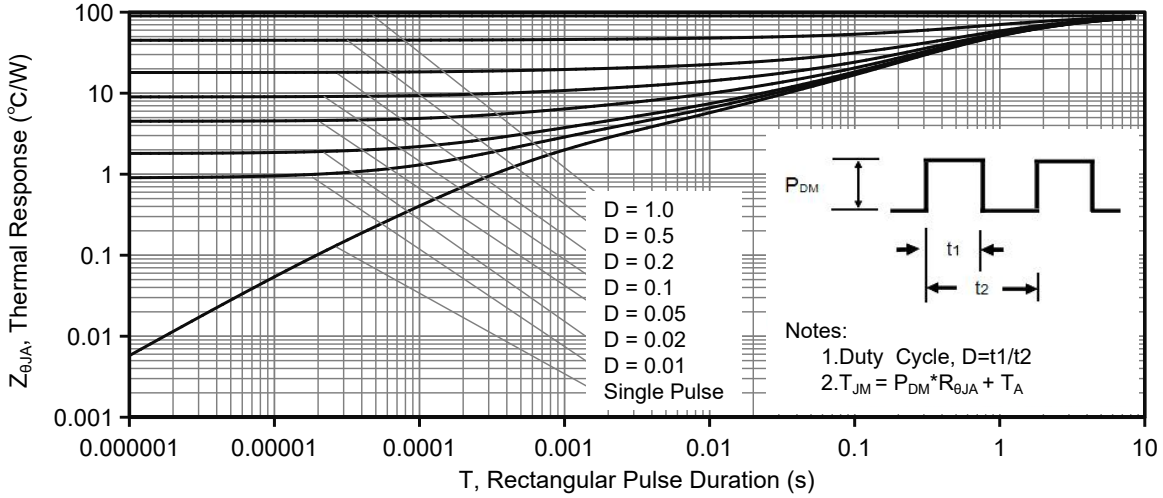


Figure 5. Maximum Effective Thermal Impedance, Junction to Ambient

Typical Characteristics T_J = 25℃, unless otherwise noted

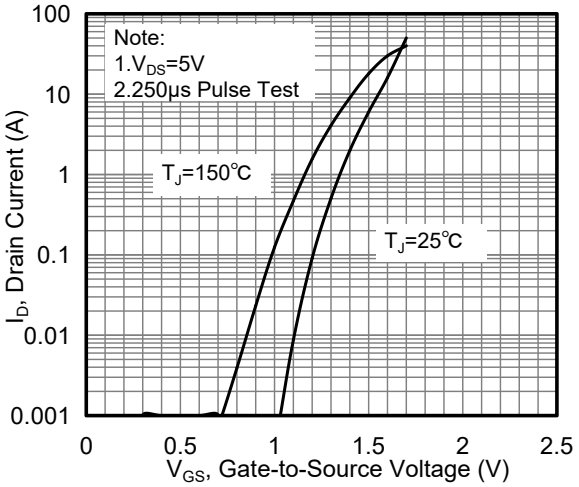


Figure 6. Typical Transfer Characteristics

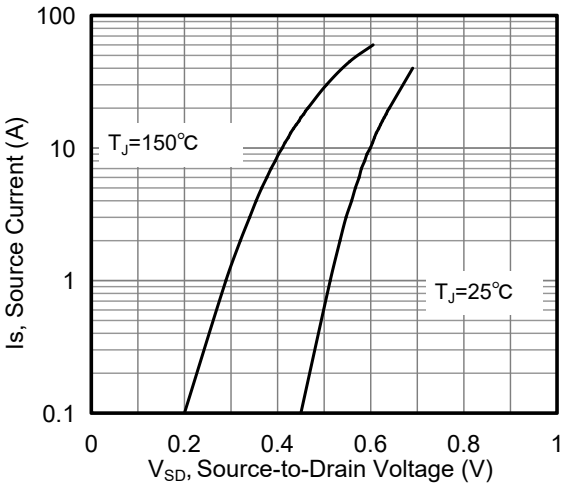


Figure 7. Typical Body Diode Transfer Characteristics

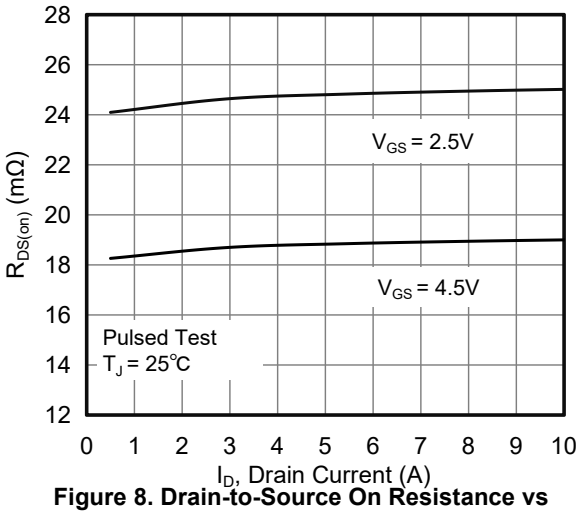


Figure 8. Drain-to-Source On Resistance vs Drain Current

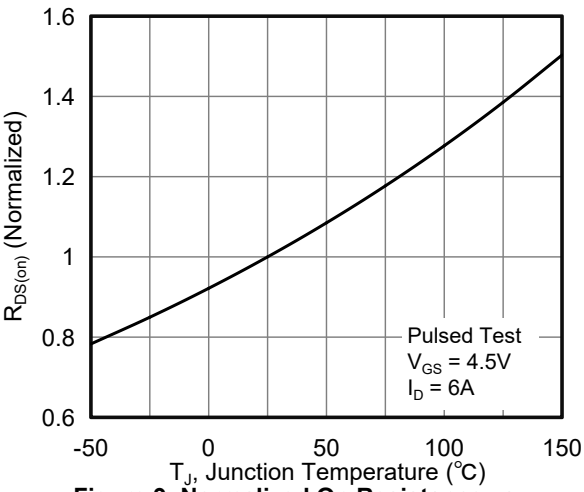


Figure 9. Normalized On Resistance vs Junction Temperature

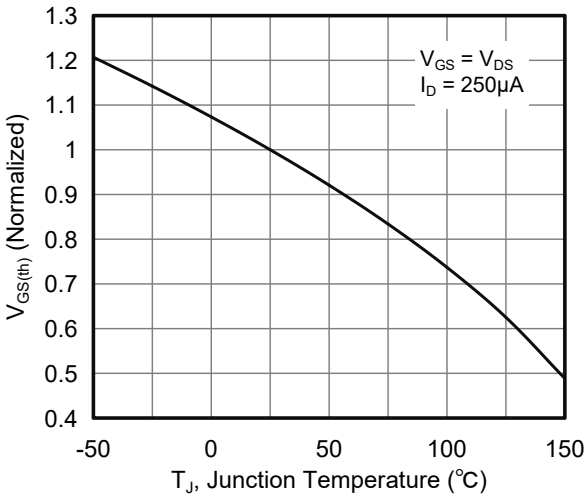


Figure 10. Normalized Threshold Voltage vs Junction Temperature

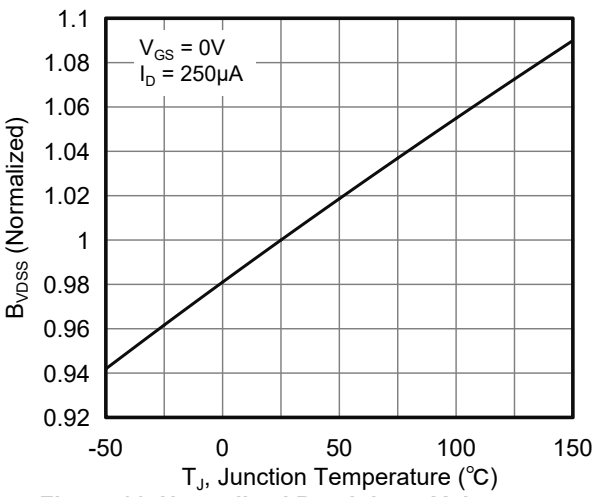


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

Typical Characteristics T_J = 25℃, unless otherwise noted

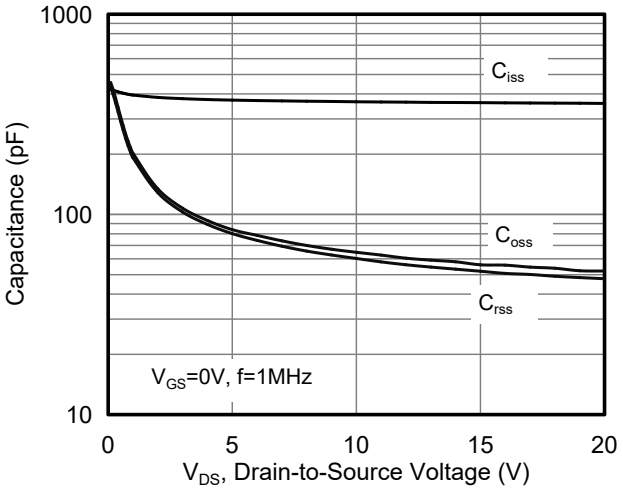


Figure 12. Capacitance Characteristics

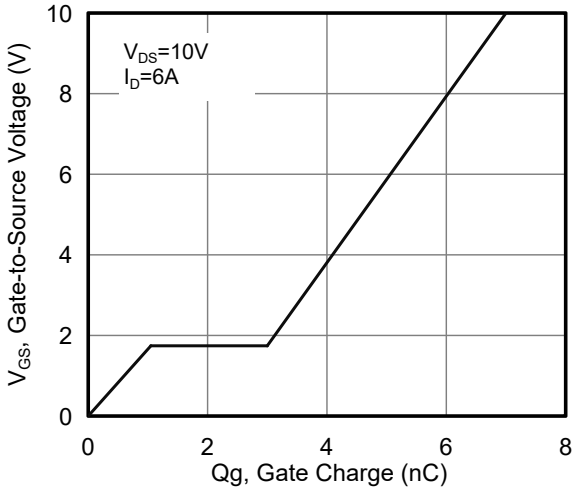


Figure 13. Typical Gate Charge vs Gate to Source Voltage

Figure A：Gate Charge Test Circuit and Waveform

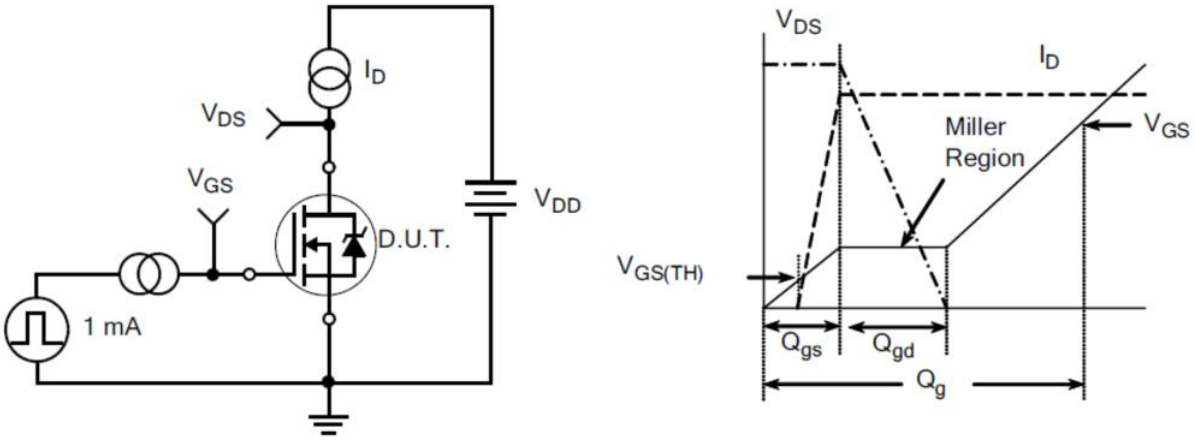


Figure B：Resistive Switching Test Circuit and Waveform

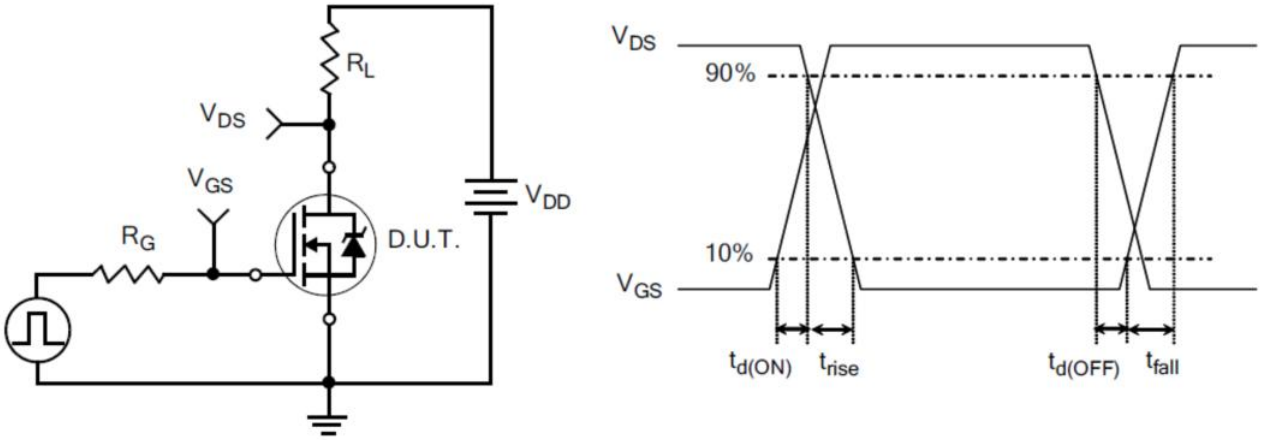
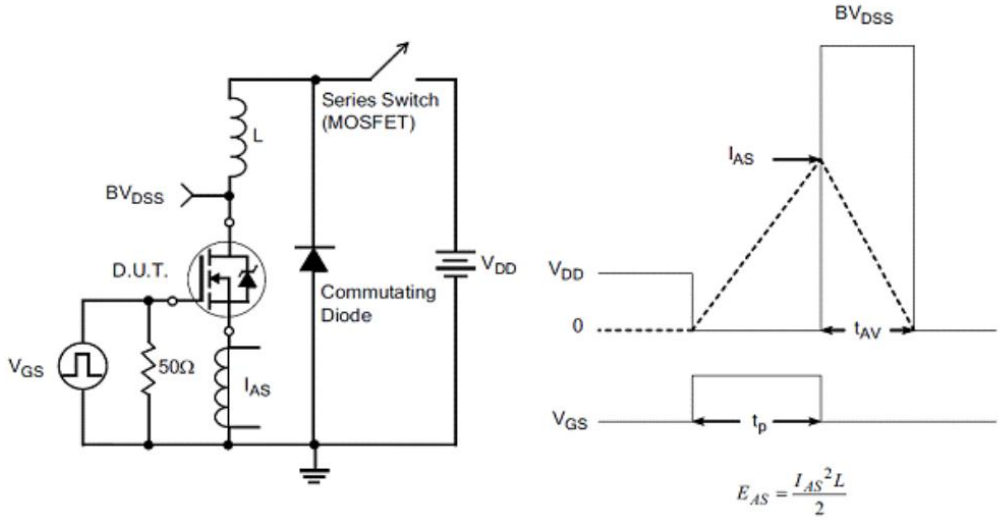
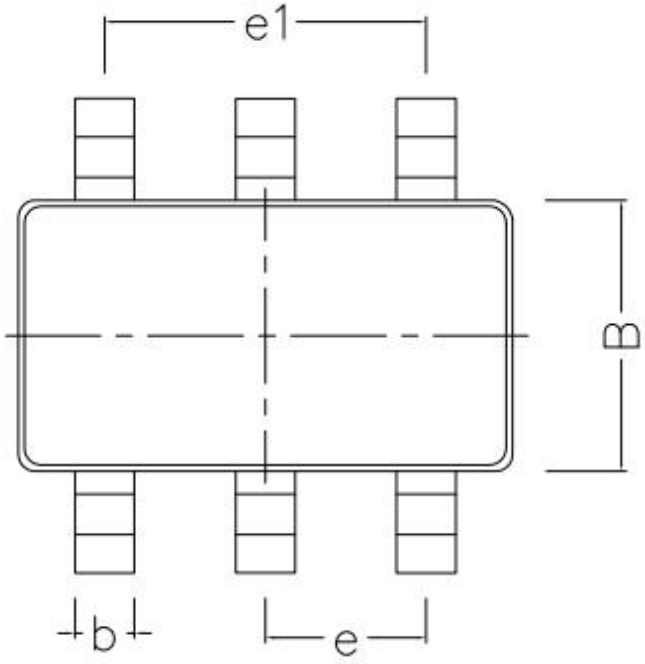


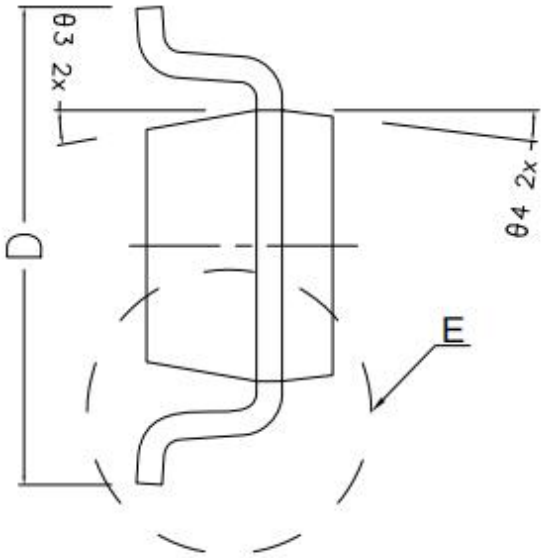
Figure C：Unclamped Inductive Switching Test Circuit and Waveform

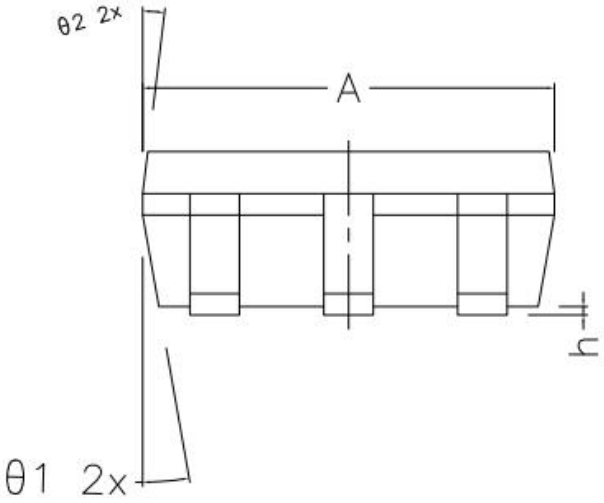


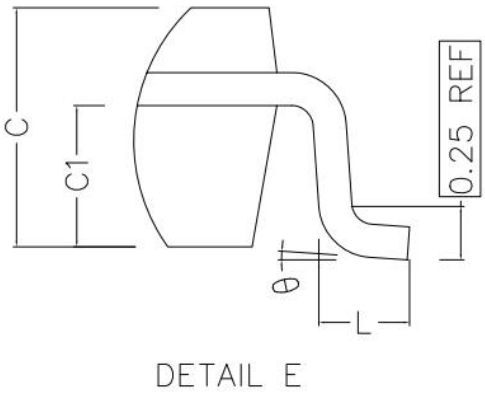
$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

Outlines SOT23-6 Package









DETAIL E

SYMBOL	MIN	NORMAL	MAX
A	2.82	2.92	3.02
B	1.5	1.6	1.7
C	1.05	1.1	1.15
C1	0.6	0.65	0.7
D	2.65	2.8	2.95
L	0.3	0.45	0.6
b	0.28	0.35	0.42
n	0.02	0.05	0.1
K	0.12	--	0.23
e	0.95type		
e1	1.9type		
θ1	10°type		
θ2	7°type		
θ3	10°type		
θ4	7°type		
θ	0°~8°		