

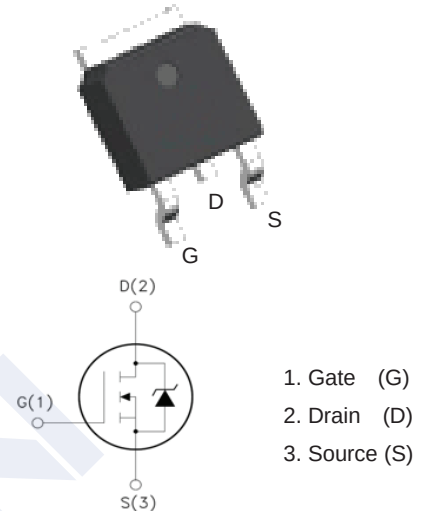
N-Channel MOSFET

2KK5116

■ Features

- $V_{DS} = 100V$
- $I_D = 53A$
- $R_{DS(ON)} < 13m\Omega$ @ $V_{GS}=10V$
- $R_{DS(ON)} < 17m\Omega$ @ $V_{GS}=4.5V$
- Low $R_{DS(ON)}$
- 100% UIS Tested

TO-252

■ Absolute Maximum Ratings ($T_A=25^\circ C$ Unless Otherwise Noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current (Note 1)	I_D	53	A
		33	
Pulsed Drain Current (Note 2)	I_{DM}	212	mJ
Single Pulse Avalanche Energy (Note 3)	E_{AS}	64	
Thermal Resistance, Junction-to-Ambient (Note 4)	$R_{\theta JA}$	55	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.9	
Maximum Power Dissipation	P_D	65	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ C$

Notes

1. The max drain current rating is silicon limited
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. $L = 0.5\text{ mH}$, $V_{DD} = 50\text{ V}$, $I_{AS} = 16\text{ A}$, $R_G = 25\text{ }\Omega$, Starting $T_J = 25\text{ }^\circ C$
4. Mount on minimum PCB layout

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■ Electrical Characteristics (Tc=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.5	2	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =25A		10	13	mΩ
		V _{GS} =4.5V, I _D =25A		14	17	
Gate Resistance	R _G	F=1MHz		1.2		Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=1MHz		1565		pF
Output Capacitance	C _{oss}			390		
Reverse Transfer Capacitance	C _{rss}			25		
Turn-On DelayTime	t _{d(on)}	V _{DD} = 50 V, R _L = 2 Ω, V _{GS} = 10 V, R _G = 3 Ω		14		ns
Turn-On Rise Time	t _r			110		
Turn-Off DelayTime	t _{d(off)}			29		
Turn-Off Fall Time	t _f			85		
Total Gate Charge	Q _g	V _{DD} = 50 V, I _D = 25 A, V _{GS} = 10 V		27		nC
Gate Source Charge	Q _{gs}			5		
Gate Drain Charge	Q _{gd}			9		
Body Diode Voltage	V _{SD}	I _S =1A, V _{GS} =0V		0.72	1	V
Diode Forward Current	I _S				53	A
Body Diode Reverse Recovery Time	t _{rr}	V _{DD} = 50 V, I _D = 25 A, di/dt = 100 A/μS		40		ns
Body Diode Reverse Recovery Charge	Q _{rr}			60		μC
Peak Reverse Recovery Current	I _{RRM}			2		A

■ Marking

Marking	K5116 K****
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■ Typical Characteristics

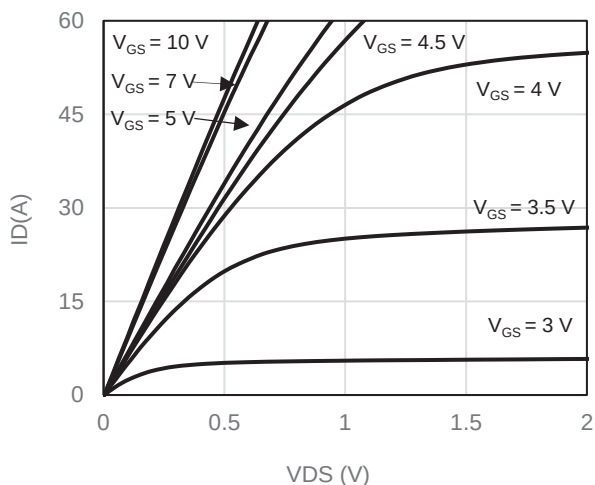


Figure 1: On-Region Characteristics

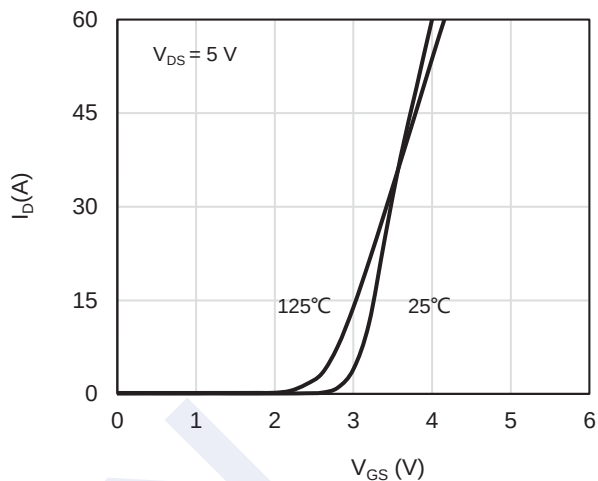


Figure 2: Transfer Characteristics

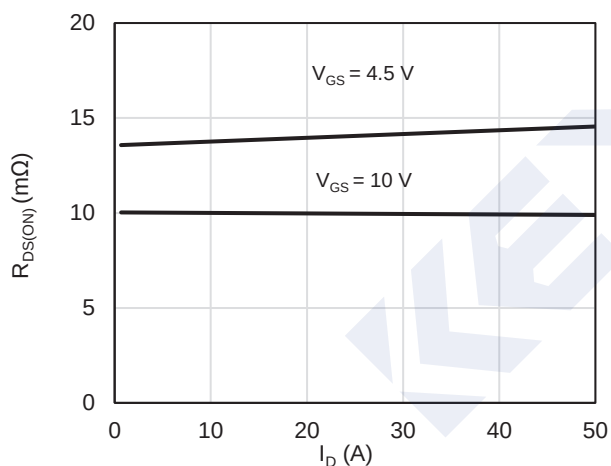


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

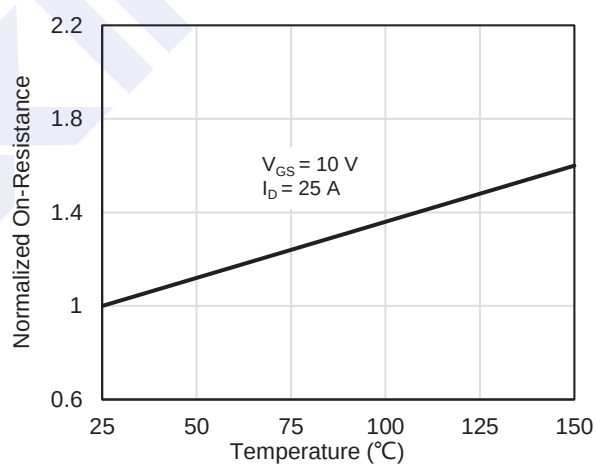


Figure 4: On-Resistance vs. Junction Temperature

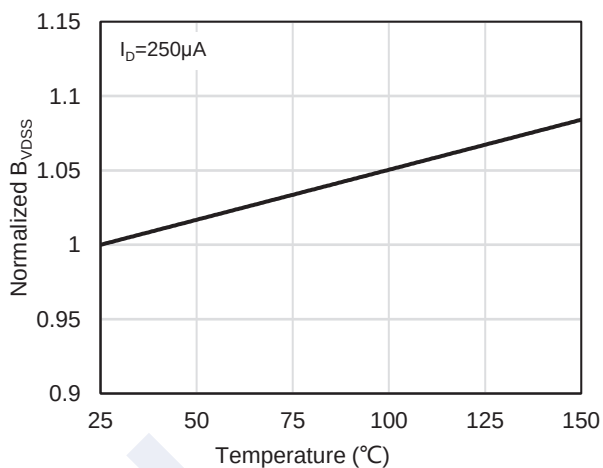


Figure 5: Breakdown Voltage vs. Junction Temperature

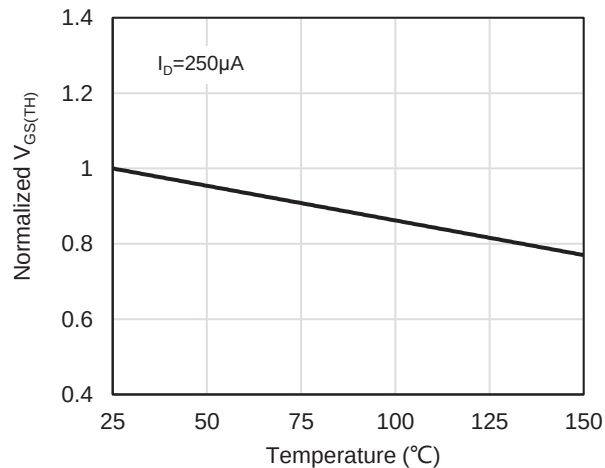


Figure 6: Threshold Voltage vs. Junction Temperature

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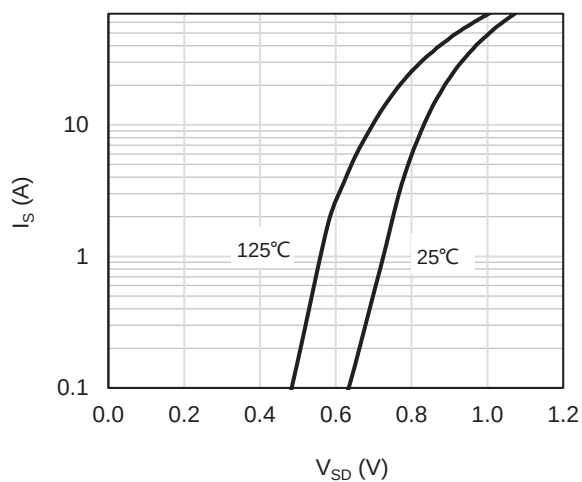


Figure 7: Body-Diode Characteristics

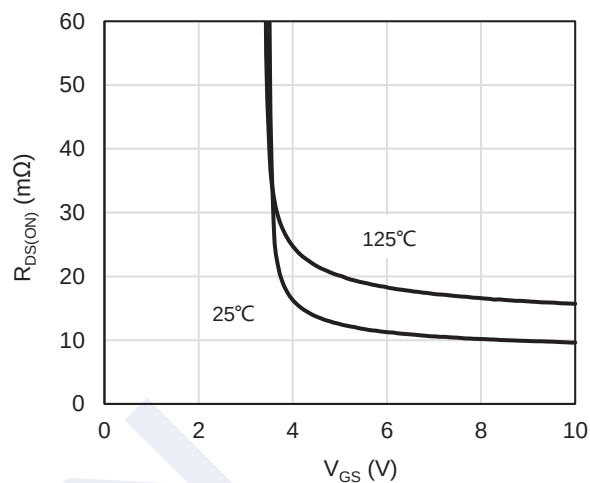


Figure 8: On-Resistance vs. Gate-Source Voltage

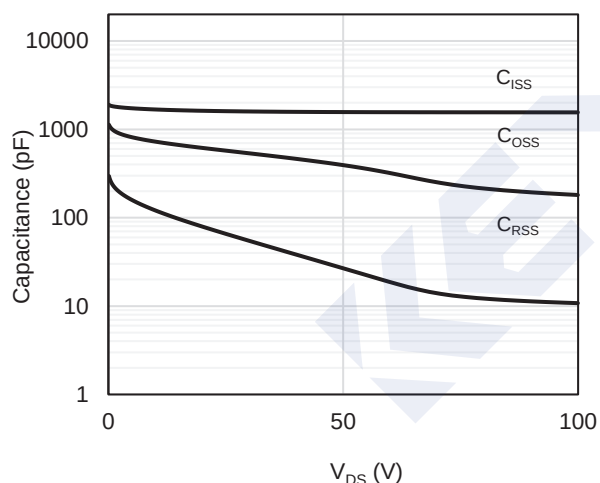


Figure 9: Capacitance Characteristics

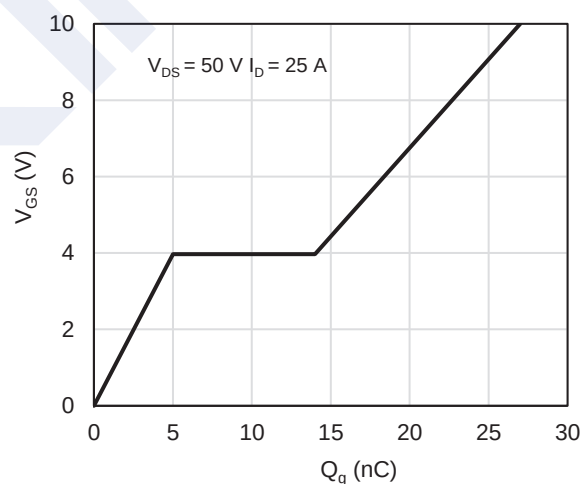


Figure 10: Gate-Charge Characteristics

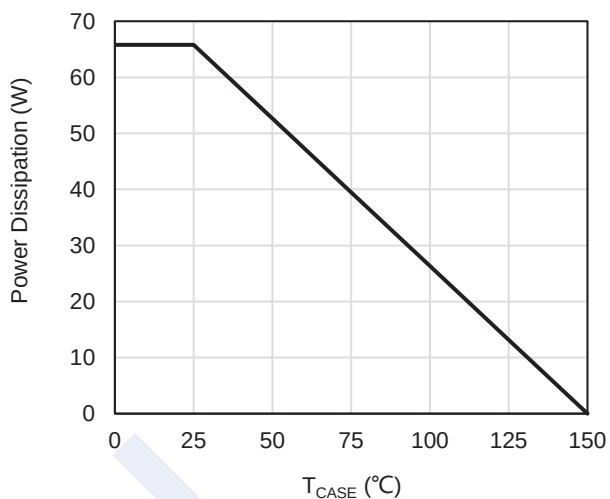


Figure 11: Power De-rating

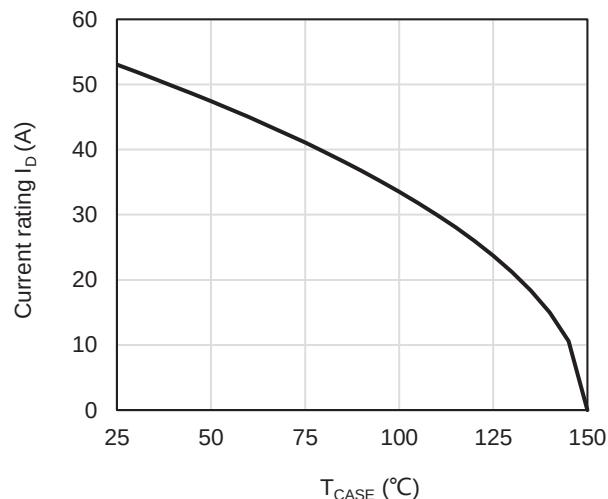


Figure 12: Current De-rating

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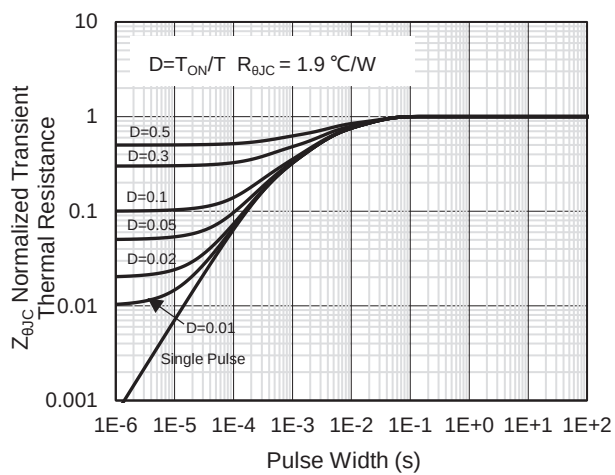


Figure 13: Normalized Maximum Transient Thermal Impedance

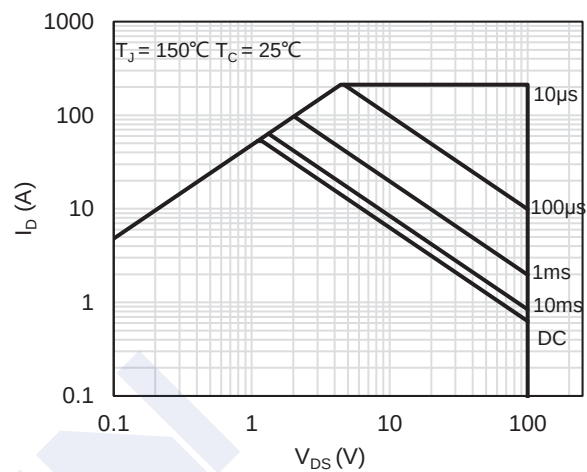
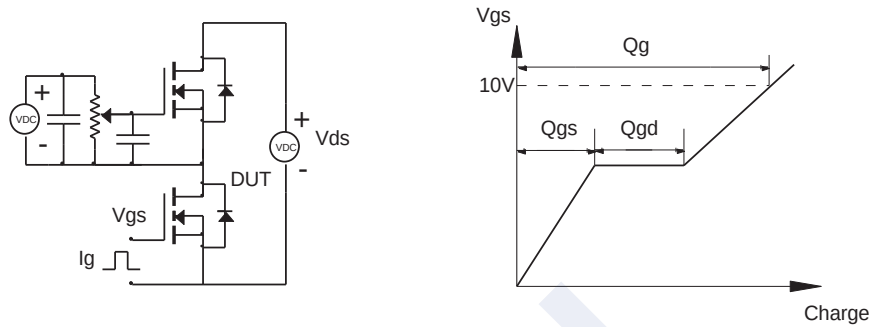


Figure 14: Maximum Forward Biased Safe Operating Area

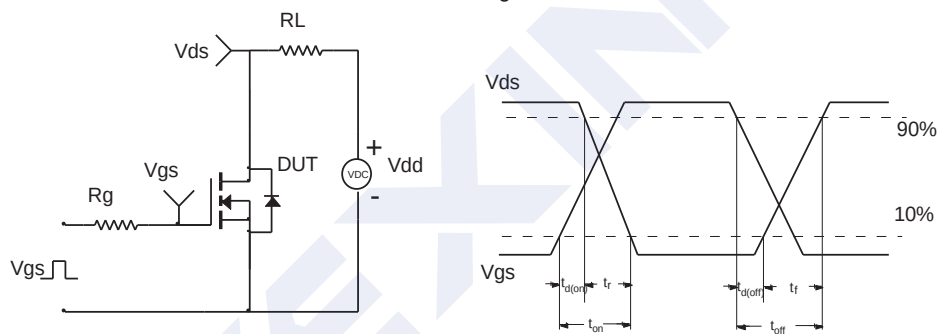
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■ Test Circuit and Waveform

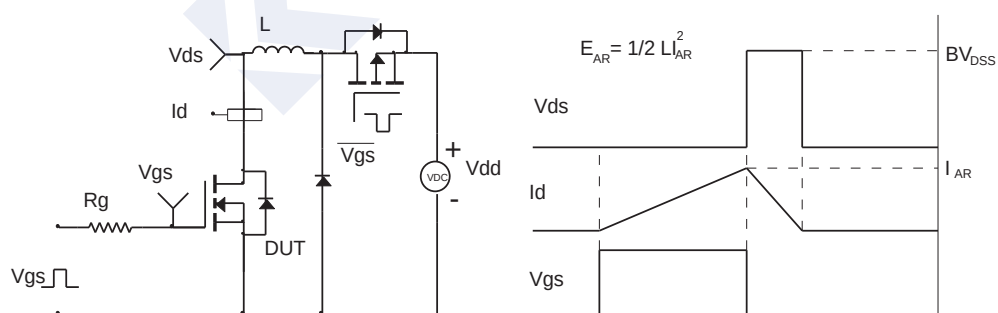
Gate Charge Test Circuit & Waveform



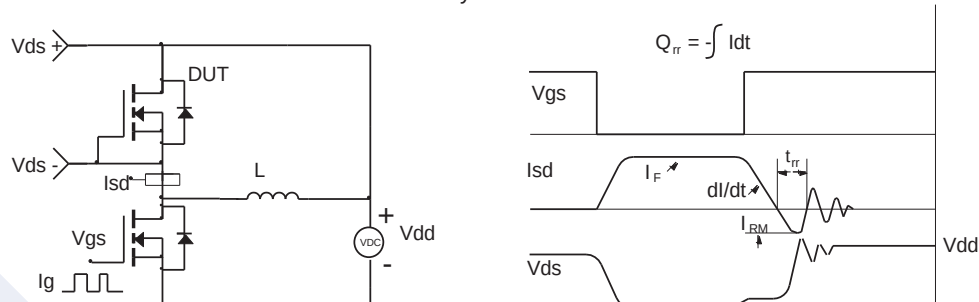
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



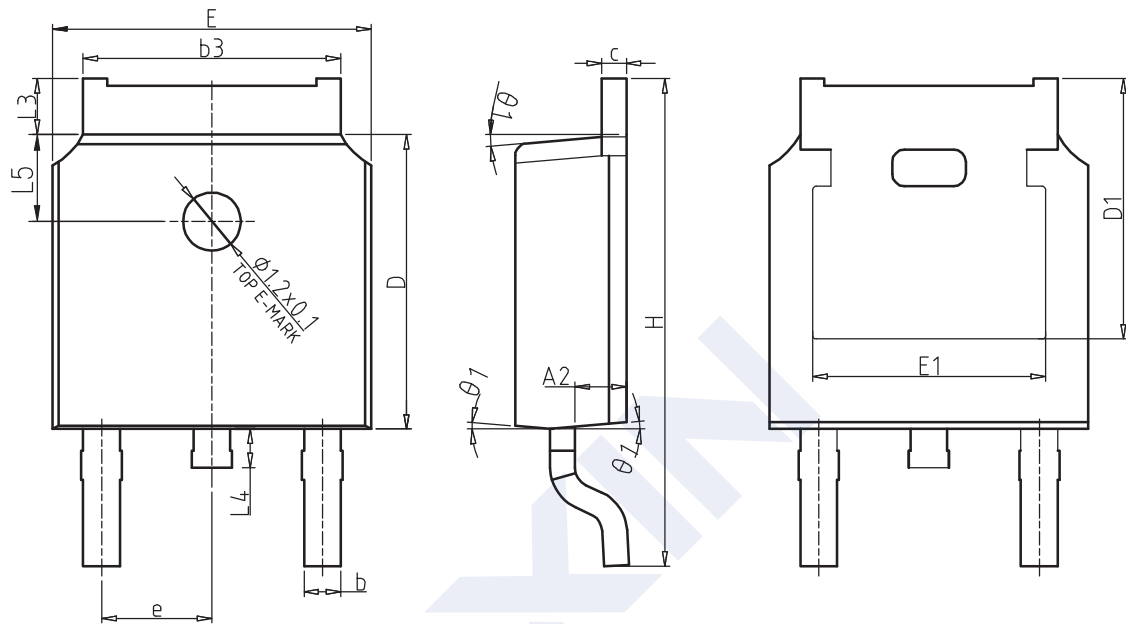
Diode Recovery Test Circuit & Waveforms



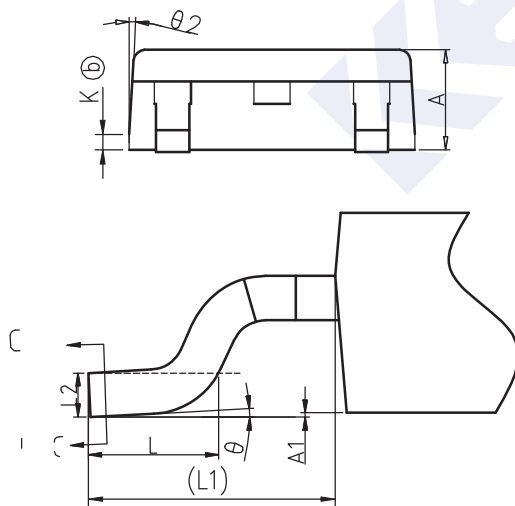
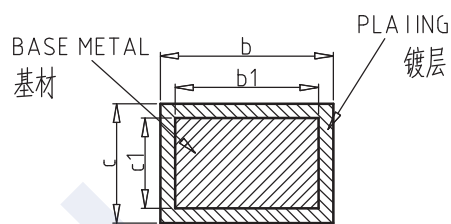
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■ Package Dimension

TO-252



COMMON DIMENSIONS



SECTION C-C

SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0.00	-	0.10
A2	0.97	1.07	1.17
b	0.72	0.78	0.85
b1	0.71	0.76	0.81
b3	5.23	5.33	5.46
c	0.47	0.53	0.58
c1	0.46	0.51	0.56
D	6.00	6.10	6.20
D1	5.30REF		
E	6.50	6.60	6.70
E1	4.70	4.83	4.92
e	2.286BSC		
H	9.90	10.10	10.30
L	1.40	1.50	1.70
L1	2.90REF		
L2	0.51BSC		
L3	0.90	-	1.25
L4	0.60	0.80	1.00
L5	1.70	1.80	1.90
Ø	0°	-	8°
Ø1	5°	7°	9°
Ø2	5°	7°	9°
K	0.40REF		