IceMOS Technology

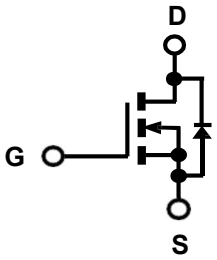
Preliminary
ICEK049G15B

ICEK049G15B N-Channel Enhancement Mode MOSFET

Product Summary			
I_D	T_A=25°C	164A	Max
$V_{(BR)DSS}$	I_D=250uA	150V	Min
$r_{DS(on)}$	V_{GS}=10V	4mΩ	Typ
Q_g	V_{DS}=75V	116nC	Typ

Features

- Ultra Low $r_{DS(on)}$
- Superior UIS performance
- 100% UIS tested
- Optimized design for Battery Management System



RoHS COMPLIANT RoHS (EU) 2015/863

CE

HALOGEN FREE

TO-263(D²PAK)
1:G, 2:D, 3:S

Maximum ratings [a] at T_j=25°C, unless otherwise specified

Parameter	*Symbol*	*Conditions*	*Value*	*Unit*
Continuous drain current [b]	I_D	T_c=25°C	164	A
		T_c=100°C	104	
Pulsed drain current [b]	$I_{D, pulse}$	T_c=25°C	530	A
Avalanche energy, single pulse	E_{AS}	L=0.5mH, V_{DD}=75V, I_D=58A, R_G=50Ω	841	mJ
Avalanche current, repetitive [b]	I_{AR}	limited by $T_j$max	58	A
Gate source voltage	V_{GS}	Static	±20	V
		AC (f>1Hz)		
Power dissipation	P_{tot}	T_c=25°C	277	W
Operating and storage temperature	T_j, T_{stg}		-55 to +150	°C

a Preliminary data sheet - Specifications subject to change.
b limited by Tj_{max}
c when mounted on 1-inch square 2oz copper-clad FR-4

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	
Thermal characteristics						
Thermal resistance, junction-case	R_{thJC}		-	-	0.45	°C/W
Thermal resistance, junction-ambient [c]	R_{thJA}	leaded	-	-	50	
Soldering temperature, wave soldering only allowed at leads	T_{sold}	1.6mm (0.063in.) from case for 10 s	-	-	260	°C

Electrical characteristics at T_j=25°C, unless otherwise specified

Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	150	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2	3	4	
Zero gate voltage drain current	I_{DSS}	V_{DS}=150V, V_{GS}=0V	-	-	1	μA
Gate source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain-source on-state resistance	$R_{DS\ (on)}$	V_{GS}=10V, I_D=20A	-	4	4.9	mΩ
Gate resistance	R_G	f=1 MHz, open drain	-	1.3	-	Ω
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}=75V, V_{GS}=0V, f=1 MHz	-	8330	-	pF
Output capacitance	C_{oss}		-	720	-	
Reverse transfer capacitance	C_{rss}		-	17	-	
Turn-on delay time	$t_{d(on)}$	V_{DS}=75V, R_L=3.75Ω, V_{GS}=10V, R_G=6.8Ω (External)	-	38	-	ns
Rise time	t_r		-	43	-	
Turn-off delay time	$t_{d(off)}$		-	96	-	
Fall time	t_f		-	43	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DS}=75V, I_D=20A, V_{GS}=0 to 10V	-	35	-	nC
Gate to drain charge	Q_{gd}		-	24	-	
Gate charge total	Q_g		-	116	-	
Reverse Diode						
Continuous forward current	I_S	V_{GS}=0V	-	-	164	A
Diode forward voltage	V_{SD}	V_{GS}=0V, I_S=1A	-	0.62	-	V
Reverse recovery time	t_{rr}	V_{RR}=75V, I_S=15A, d_{iF}/d_t=100 A/µS	-	105	-	ns
Reverse recovery charge	Q_{rr}		-	434	-	nC
Peak reverse recovery current	I_{rm}		-	7	-	A

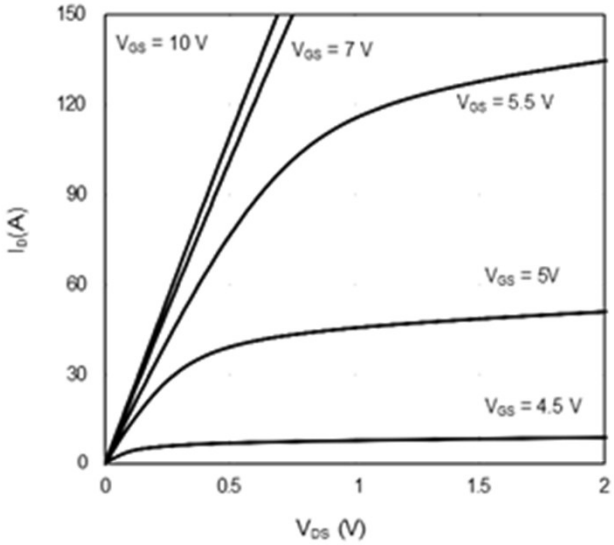


Figure 1: On-Region Characteristics

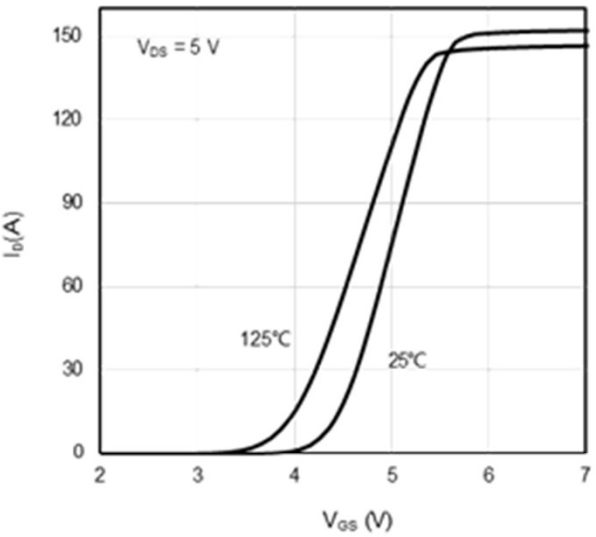


Figure 2: Transfer Characteristics

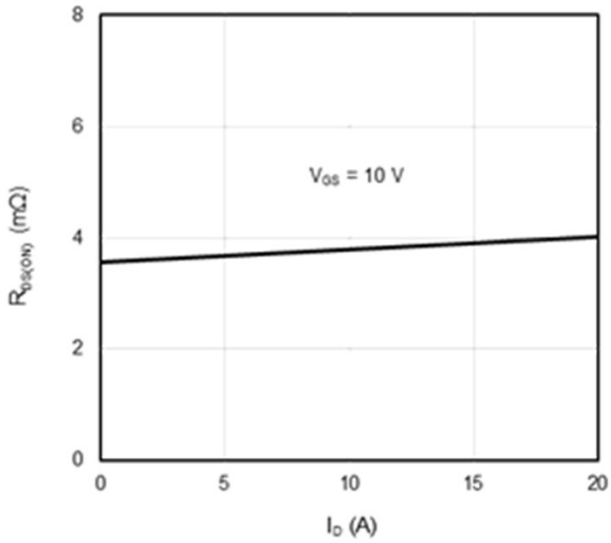


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

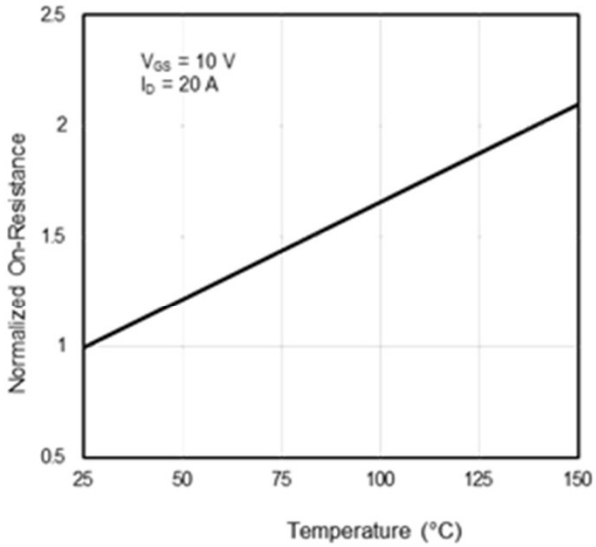


Figure 4: On-Resistance vs. Junction Temperature

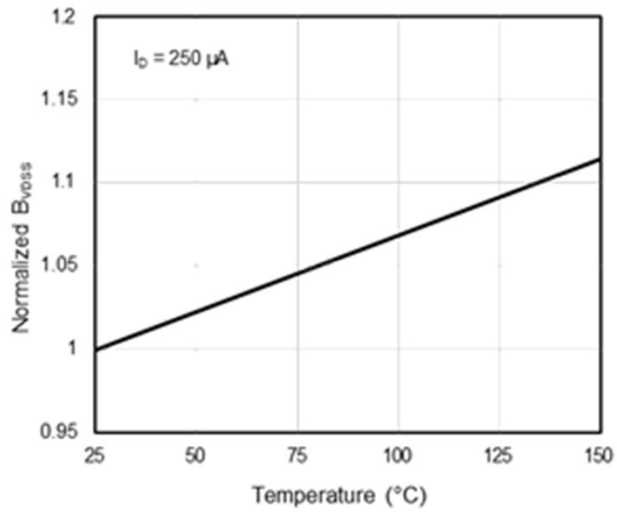


Figure 5: Breakdown Voltage vs. Junction Temperature

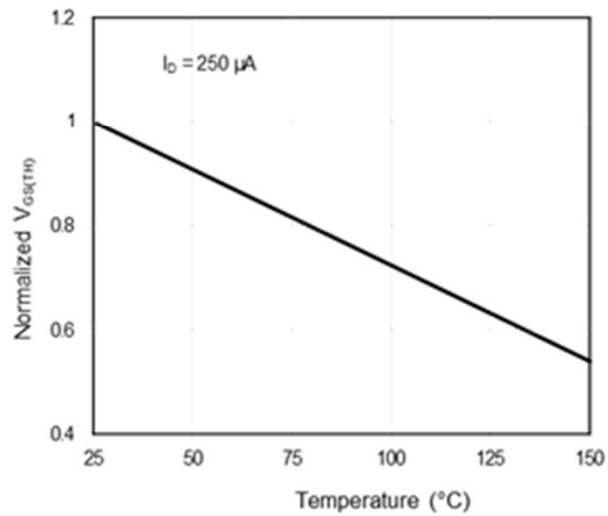


Figure 6: Threshold Voltage vs. Junction Temperature

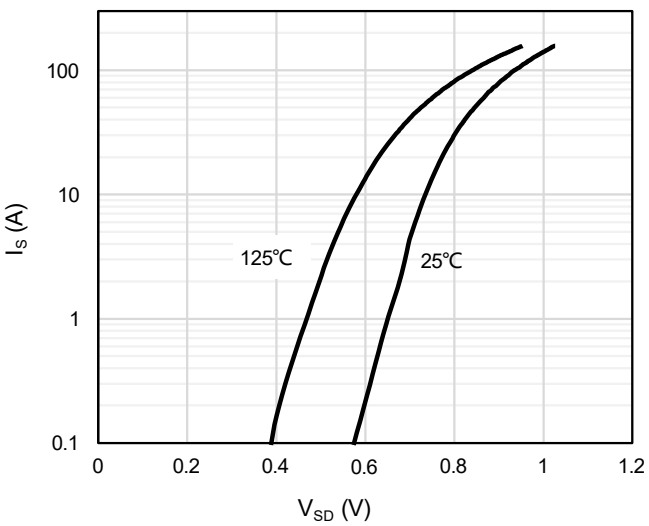


Figure 7: Body-Diode Characteristics

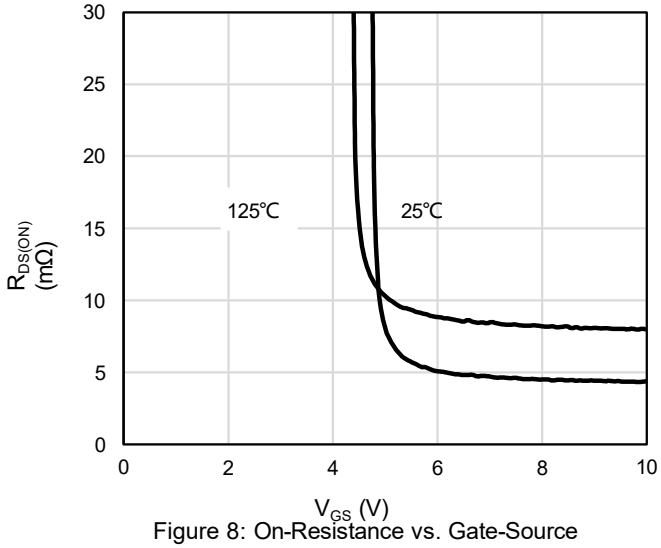


Figure 8: On-Resistance vs. Gate-Source Voltage

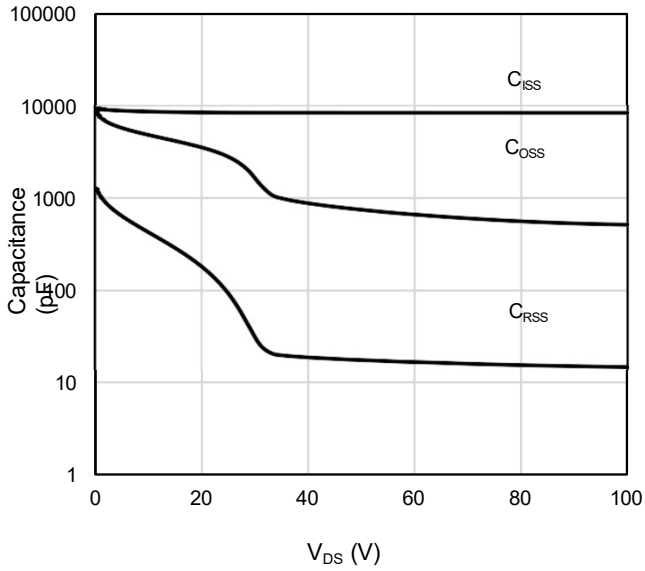


Figure 9: Capacitance Characteristics

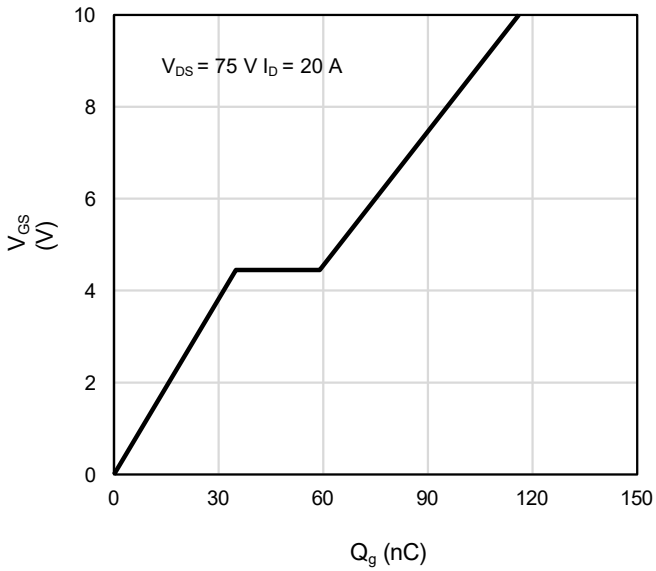


Figure 10: Gate-Charge Characteristics

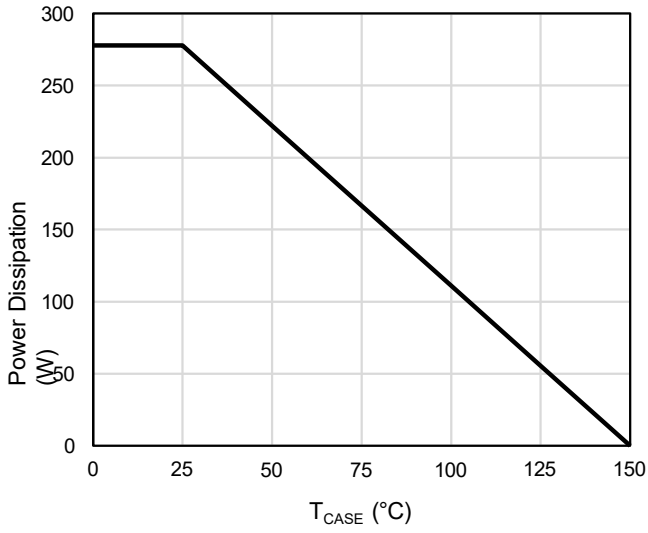


Figure 11: Power De-rating

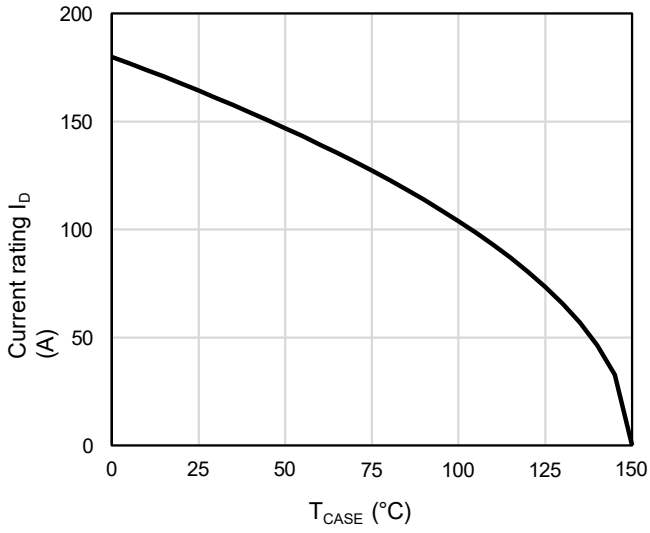


Figure 12: Current De-rating

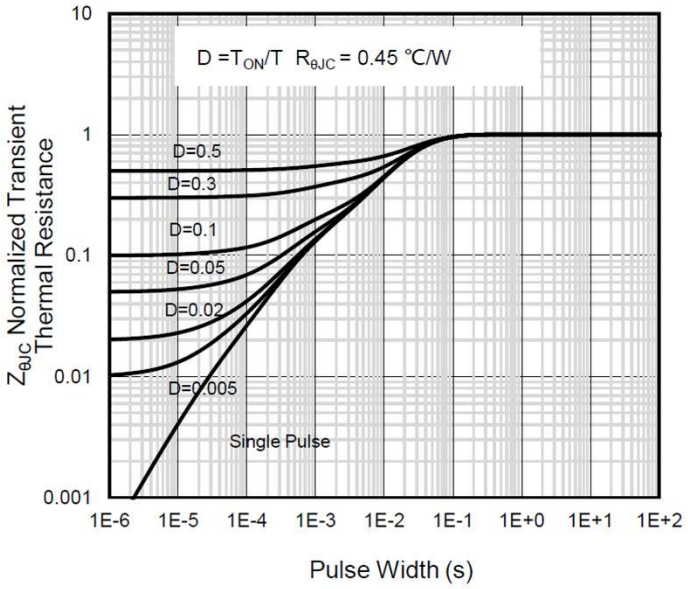


Figure 13: Normalized Maximum Transient Thermal Impedance

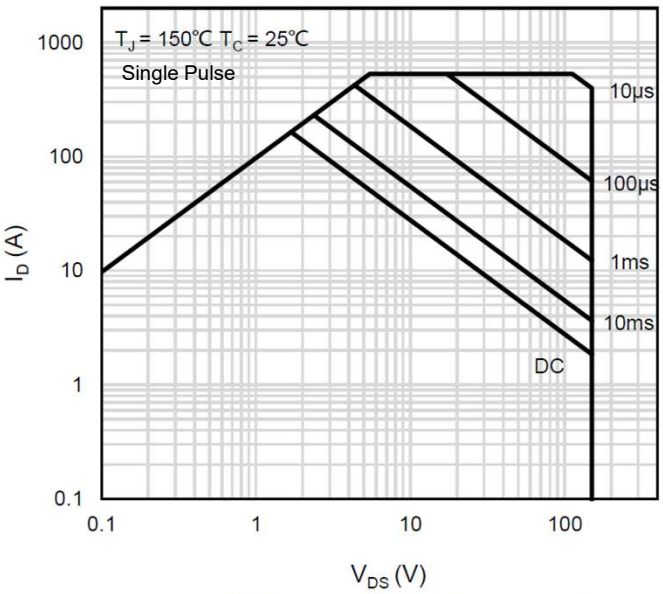
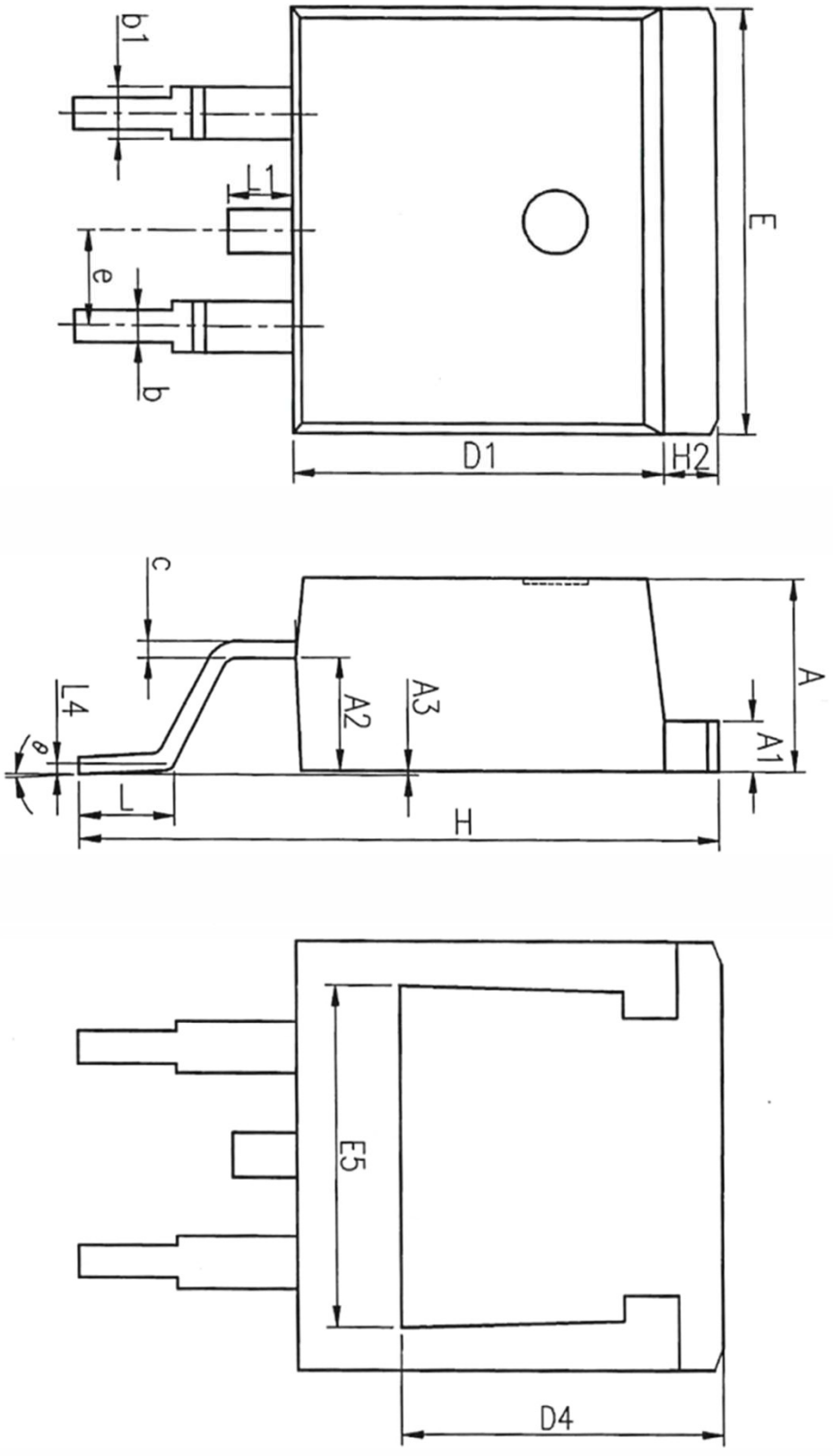


Figure 14: Maximum Forward Biased Safe Operating Area

Package Outline: TO-263(D²PAK)



Package Outline: TO-263(D²PAK)

SYMBOL	MM		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0.00	0.13	0.25
b	0.70	0.81	0.96
b1	1.17	1.27	1.47
c	0.30	0.38	0.53
D1	8.50	8.70	8.90
D4	6.60	-	-
E	9.86	10.16	10.36
E5	7.06	-	-
e		2.54 BSC	
H	14.70	15.10	15.50
H2	1.07	1.27	1.47
L	2.00	2.30	2.60
L1	1.40	1.55	1.70
L4		0.25 BSC	
θ	0°	5°	9°

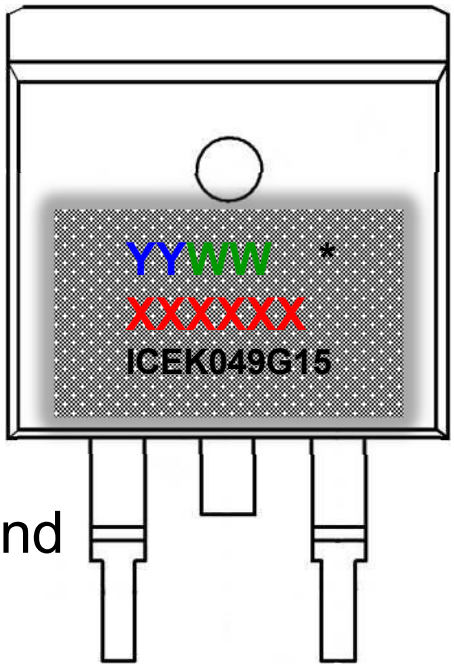
Marking Information

YY = Last two digits of the year

WW = Work week

* = Site ID

XXXXXX = Lot ID



ICEK049G15 = ICE is IceMOS logo and K049G15 is a designated device part number

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