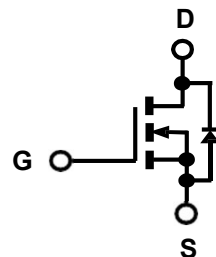


ICEK022G10B N-Channel Enhancement Mode MOSFET

Features

- Low $r_{DS(on)}$
- Superior switching performance
- 100% UIS tested
- Optimized design for DC-DC Converter and BMS

Product Summary			
I_D	$T_A=25^\circ\text{C}$	175A	Max
$V_{(BR)DSS}$	$I_D=1\text{mA}$	100V	Min
$r_{DS(on)}$	$V_{GS}=10\text{V}$	1.6m Ω	Typ
Q_g	$V_{DS}=50\text{V}$	155nC	Typ



TO-263(D²PAK)
1:G, 2:D, 3:S

Maximum ratings^a at $T_j=25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current ^b	I_D	$T_c=25^\circ\text{C}$ silicon limit	265	A
		$T_c=25^\circ\text{C}$ package limit	175	
		$T_c=100^\circ\text{C}$ package limit	175	
Pulsed drain current ^b	$I_{D, \text{pulse}}$	$T_c=25^\circ\text{C}$	960	A
Avalanche energy, single pulse	E_{AS}	$L=0.5\text{mH}$, $V_{DD}=50\text{V}$, $I_D=53\text{A}$, $R_G=50\Omega$	702	mJ
Avalanche current, repetitive ^b	I_{AR}	limited by $T_j\text{max}$	53	A
Gate source voltage	V_{GS}	Static	± 20	V
		AC ($f>1\text{Hz}$)		
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	333.3	W
Operating and storage temperature	T_j, T_{stg}		-55 to +175	$^\circ\text{C}$

a Preliminary data sheet - Specifications subject to change.

b limited by $T_{j\text{max}}$

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 °	R_{thJA}	lead	-	-	50	
Soldering temperature, wave soldering only allowed at leads	T_{solder}	1.6mm (0.063in.) from case for 10 s	-	-	260	°C

Electrical characteristics at $T_j=25^{\circ}\text{C}$, unless otherwise specified

Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=1mA$	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	2.8	4	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=100A$	-	1.6	2.2	m Ω
Gate resistance	R_G	$f=1\text{ MHz}$, open drain	-	1.5	-	Ω

Dynamic characteristics

Input capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1\text{ MHz}$	-	11445	-	pF
Output capacitance	C_{oss}		-	2045	-	
Reverse transfer capacitance	C_{rss}		-	70	-	
Turn-on delay time	$t_{d(on)}$	$V_{DS}=50V, R_L=0.5\Omega, V_{GS}=10V, R_G=6.8\Omega$ (External)	-	47	-	ns
Rise time	t_r		-	93	-	
Turn-off delay time	$t_{d(off)}$		-	110	-	
Fall time	t_f		-	140	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

Gate charge characteristics

Gate to source charge	Q_{gs}	$V_{DS}=50V, I_D=100A,$ $V_{GS}=0 \text{ to } 10V$	-	48	-	nC
Gate to drain charge	Q_{gd}		-	30	-	
Gate charge total	Q_g		-	155	-	

Reverse Diode

Continuous forward current	I_S	$V_{GS}=0V$	-	-	175	A
Diode forward voltage	V_{SD}	$V_{GS}=0V, I_S=100A$	-	0.85	-	V
Reverse recovery time	t_{rr}	$V_{RR}=50V, I_S=50A,$ $d_{iF}/d_t=100 \text{ A}/\mu\text{S}$	-	95	-	ns
Reverse recovery charge	Q_{rr}		-	280	-	nC
Peak reverse recovery current	I_{rm}		-	5	-	A

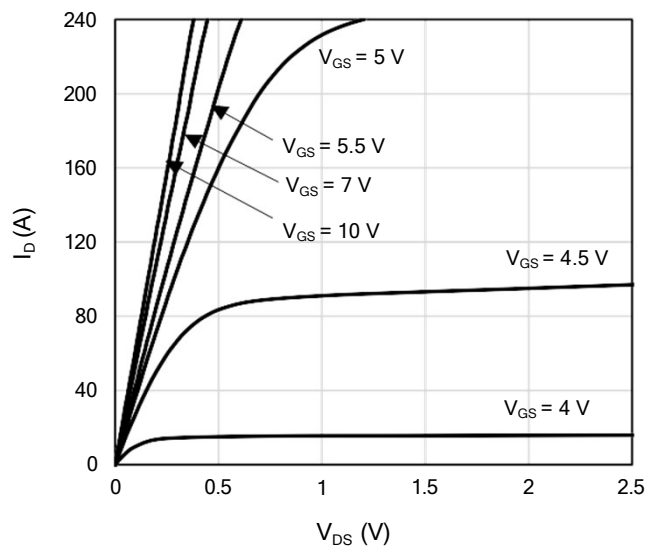


Figure 1: On-Region Characteristics

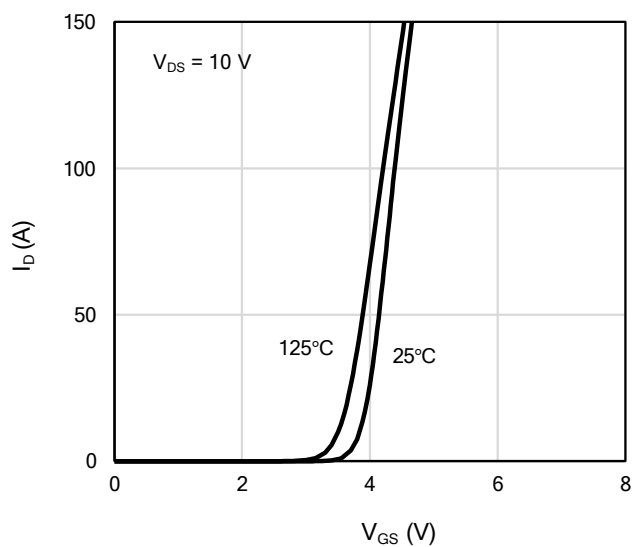


Figure 2: Transfer Characteristics

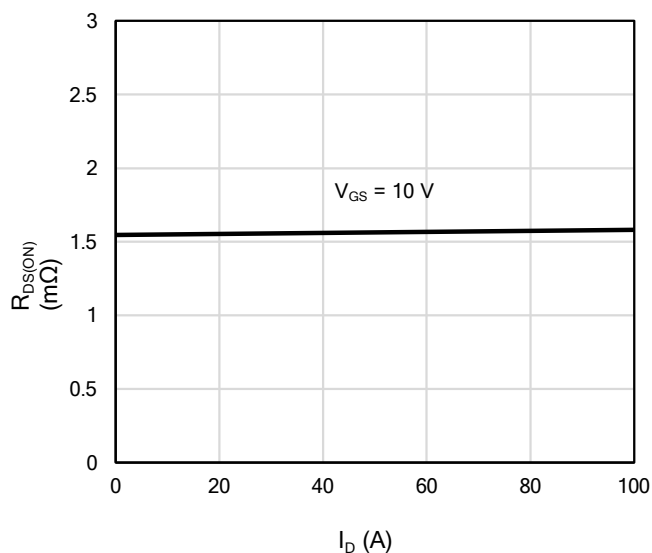


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

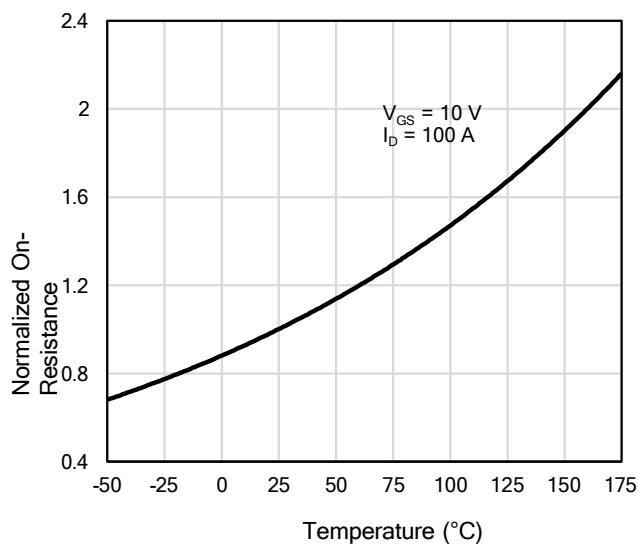


Figure 4: On-Resistance vs. Junction Temperature

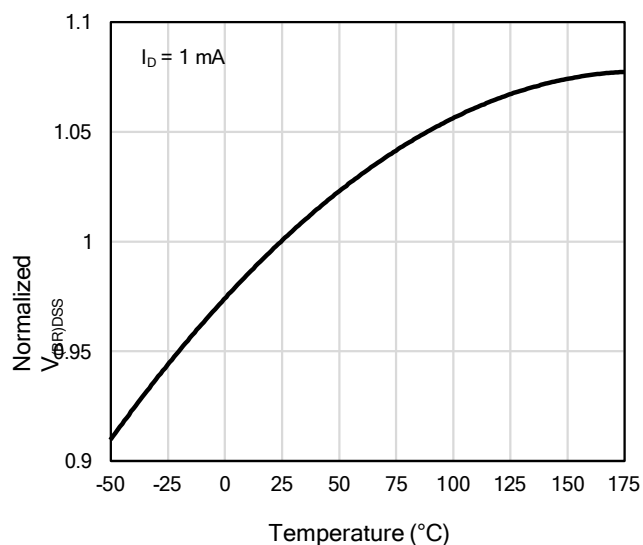


Figure 5: Breakdown Voltage vs. Junction Temperature

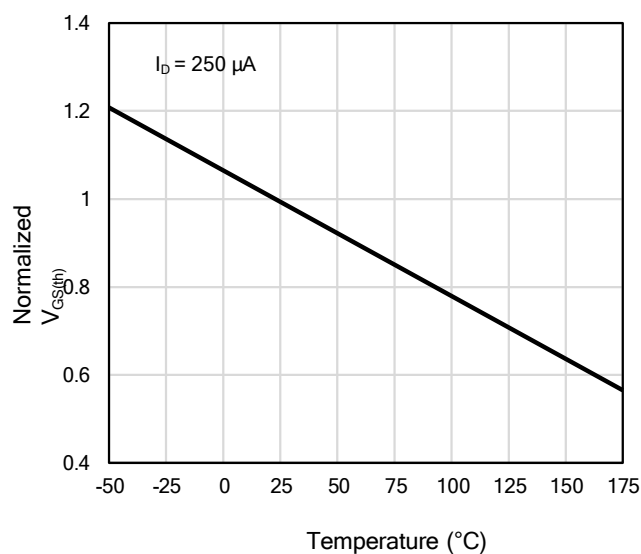


Figure 6: Threshold Voltage vs. Junction Temperature

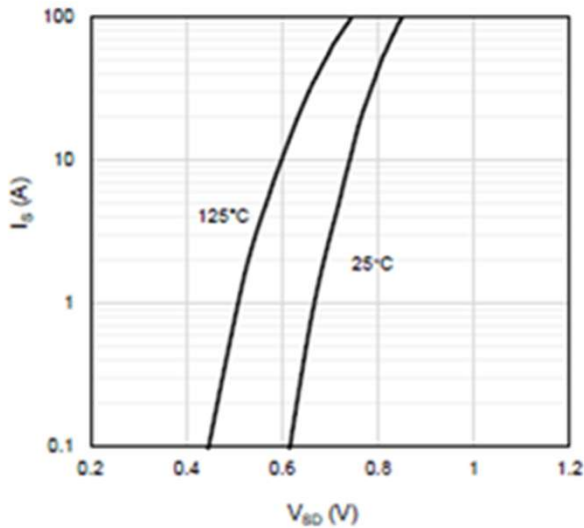


Figure 7: Body-Diode Characteristics

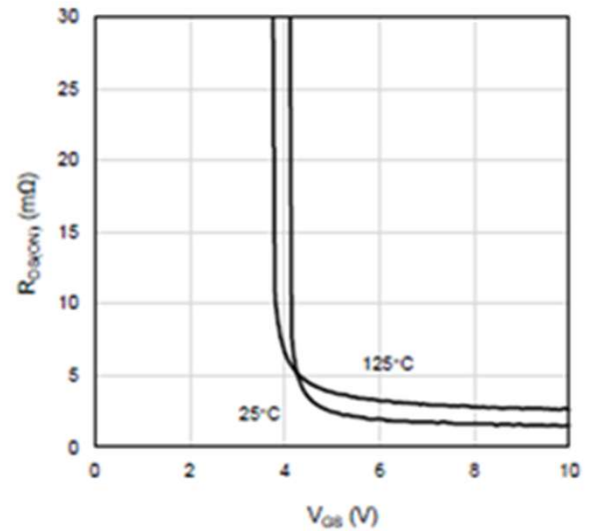


Figure 8: On-Resistance vs. Gate-Source Voltage

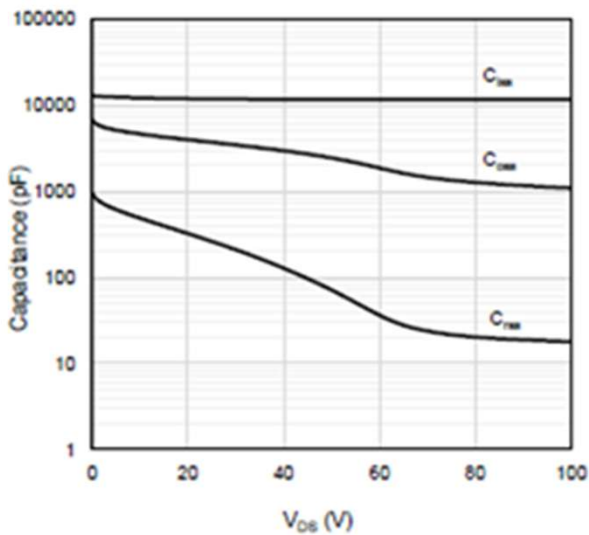


Figure 9: Capacitance Characteristics

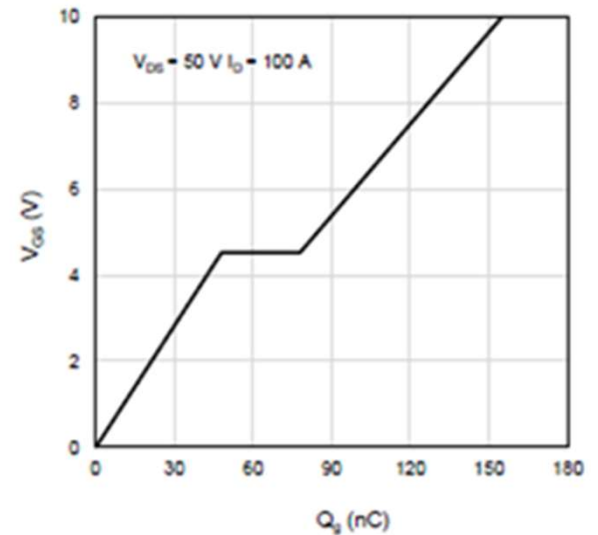


Figure 10: Gate-Charge Characteristics

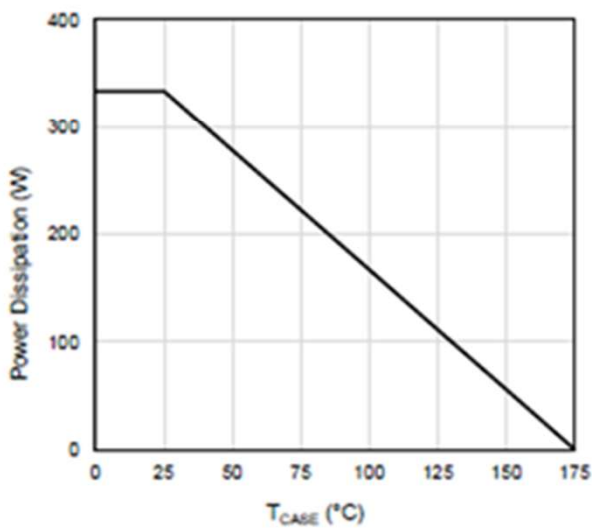


Figure 11: Power De-rating

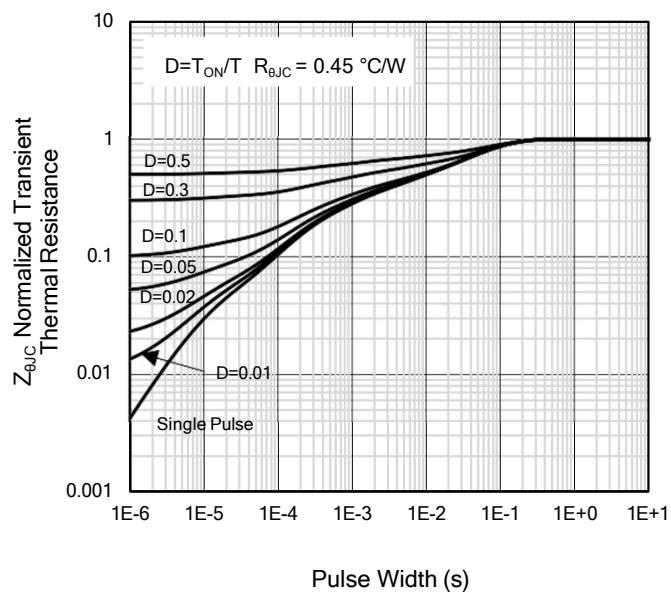


Figure 12: Normalized Maximum Transient Thermal Impedance

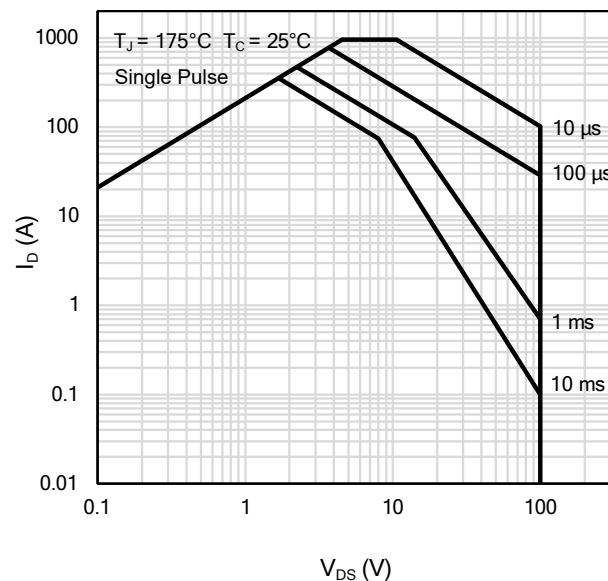
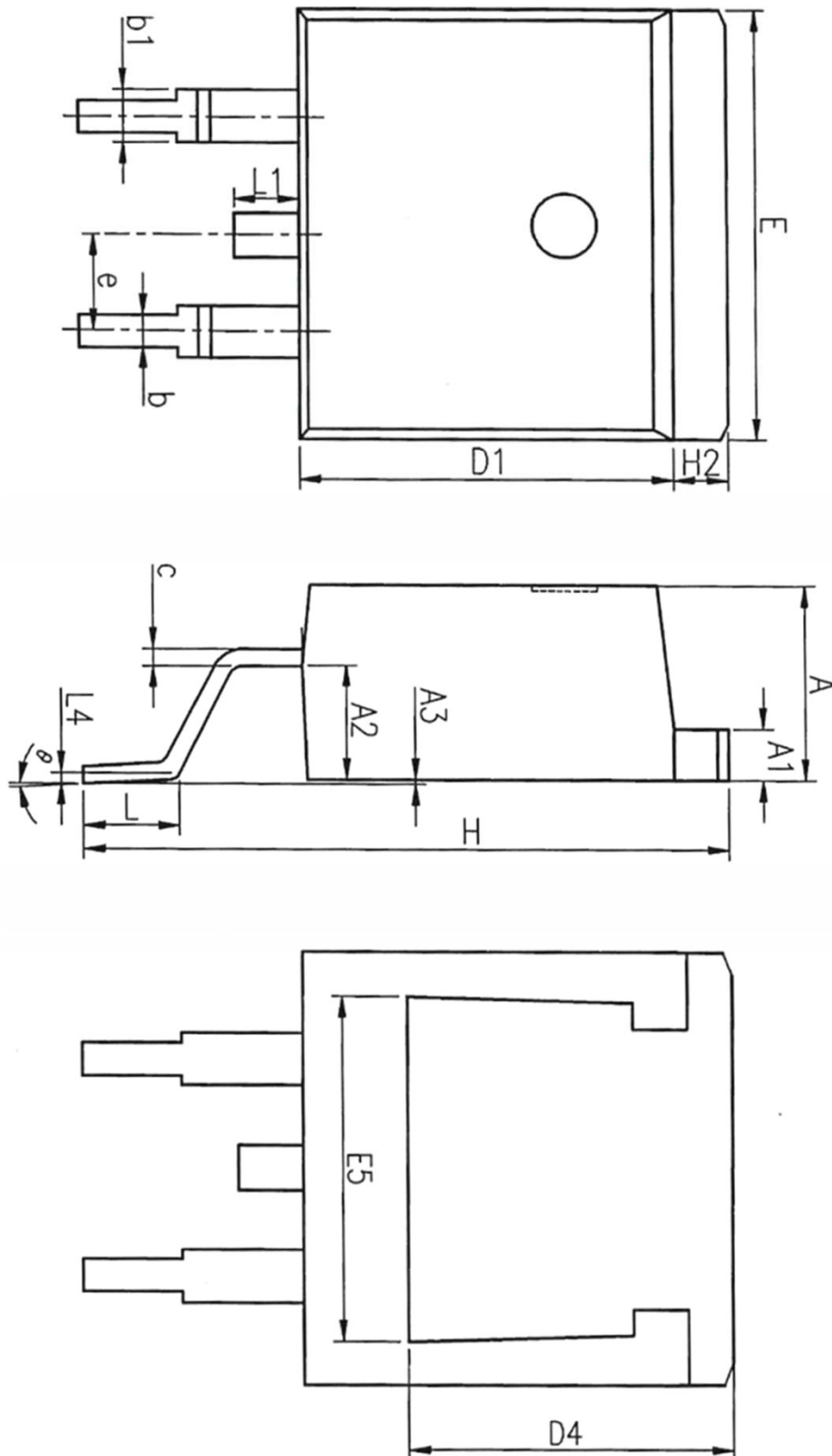


Figure 13: Maximum Forward Biased Safe Operating Area

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

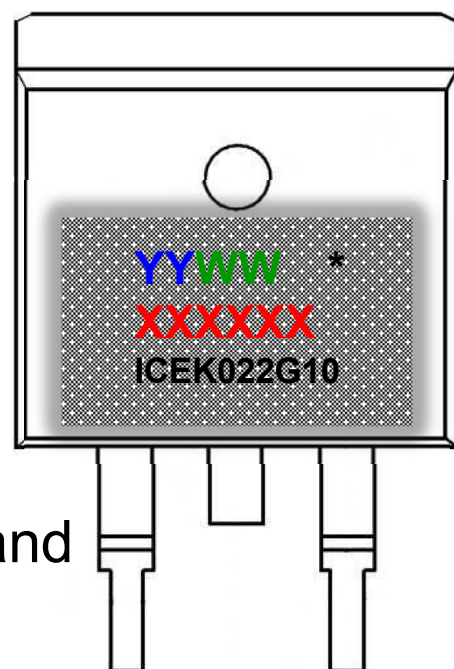
YY = Last two digits of the year

WW = Work week

***** = Site ID

XXXXXX = Lot ID

ICEK022G10 = ICE is IceMOS logo and K022G10 is a designated device part number



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