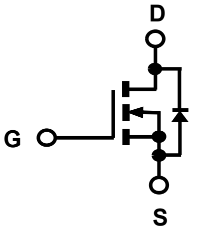
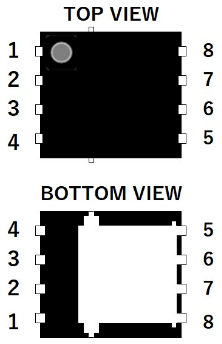
ICEK012G8LK N-Channel Enhancement Mode MOSFET

Product Summary			
I_D	T_A=25°C	283A	Max
$V_{(BR)DSS}$	I_D=250uA	80V	Min
$r_{DS(on)}$	V_{GS}=10V	1.05mΩ	Typ
Q_g	V_{DS}=40V	113nC	Typ

Features

- Ultra Low $r_{DS(on)}$
- Superior switching performance
- Optimized designs for Motor Drivers and Synchronous Rectification





DFN5x6

1-3=Source

4=Gate, 5-8=Drain

RoHS COMPLIANT
RoHS (EU)
2015/863

HALOGEN FREE

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	283	A
		T_c=100°C	179	
Pulsed drain current [b]	$I_{D,\ pulse}$	T_c=25°C	1132	A
Avalanche energy, single pulse	E_{AS}	L=0.5mH, V_{DD}=40V, I_D=44A, R_G=50Ω	484	mJ
Avalanche current, repetitive [b]	I_{AR}	limited by $T_j$max	44	A
Gate source voltage	V_{GS}	Static	±20	V
		AC (f>1Hz)		
Power dissipation	P_{tot}	T_c=25°C	183	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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Thermal resistance, junction-case	R_{thJC}		-	-	0.68	°C/W
Thermal resistance, junction-ambient [c]	R_{thJA}	leaded	-	-	45	
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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(\mathrm{BR})\mathrm{DSS}}$	V_{GS}=0V, I_{D}=250μA	80	-	-	V
Gate threshold voltage	$V_{\mathrm{GS(th)}}$	V_{DS}=V_{GS}, I_{D}=250μA	2	3	4	
Zero gate voltage drain current	I_{DSS}	V_{DS}=80V, V_{GS}=0V	-	-	1	μA
Gate source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain-source on-state resistance	$R_{\mathrm{DS\ (on)}}$	V_{GS}=10V, I_{D}=88A	-	1.05	1.28	mΩ
Gate resistance	R_{G}	f=1 MHz, open drain	-	2	-	Ω

Dynamic characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input capacitance	C_{iss}	V_{DS}=40V, V_{GS}=0V, f=1 MHz	-	8255	-	pF
Output capacitance	C_{oss}		-	4271	-	
Reverse transfer capacitance	C_{rss}		-	68	-	
Turn-on delay time	$t_{\mathrm{d(on)}}$	V_{DS}=40V, R_{L}=0.5Ω, V_{GS}=10V, R_{G}=3.3Ω (External)	-	31	-	ns
Rise time	t_{r}		-	54	-	
Turn-off delay time	$t_{\mathrm{d(off)}}$		-	56	-	
Fall time	t_{f}		-	43	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

Gate charge characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Gate to source charge	Q_{gs}	V_{DS}=40V, I_D=50A, V_{GS}=0 to 10V	-	40	-	nC
Gate to drain charge	Q_{gd}		-	20	-	
Gate charge total	Q_g		-	113	-	

Reverse Diode

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous forward current	I_S	V_{GS}=0V	-	-	283	A
Diode forward voltage	V_{SD}	V_{GS}=0V, I_S=88A	-	0.84	-	V
Reverse recovery time	t_{rr}	V_{RR}=40V, I_S=50A, d_{iF}/d_t=100 A/μS	-	110	-	ns
Reverse recovery charge	Q_{rr}		-	260	-	nC
Peak reverse recovery current	I_{rm}		-	4	-	A

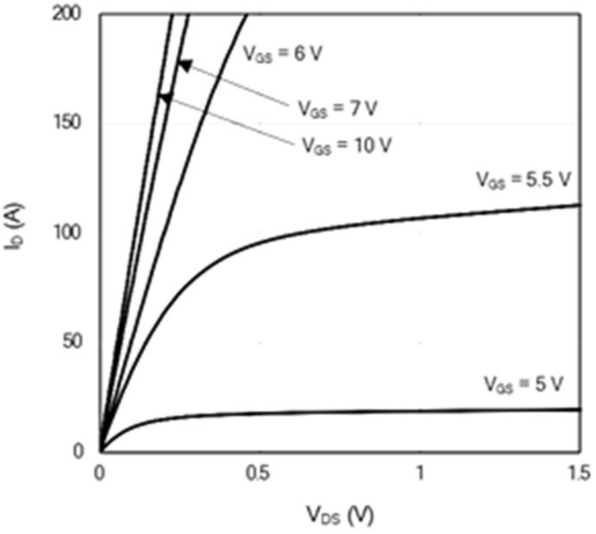


Figure 1: On-Region

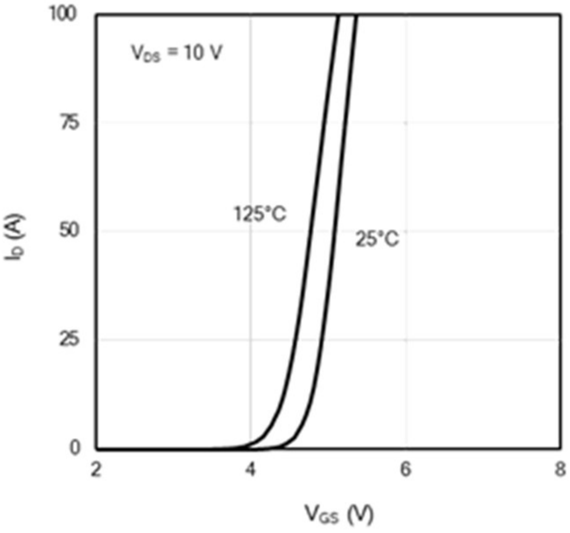


Figure 2: Transfer Characteristics

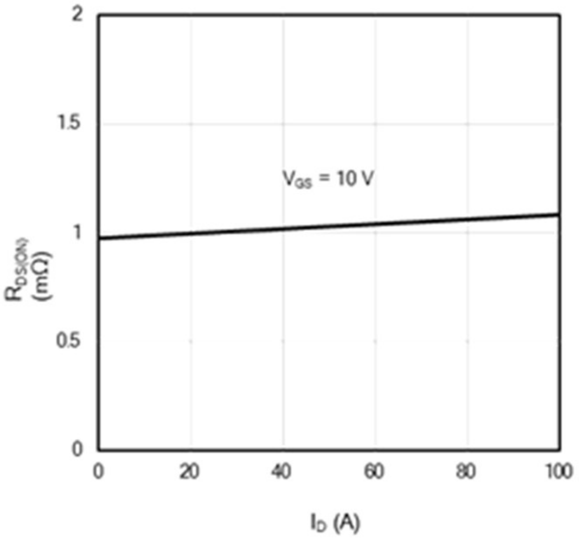


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

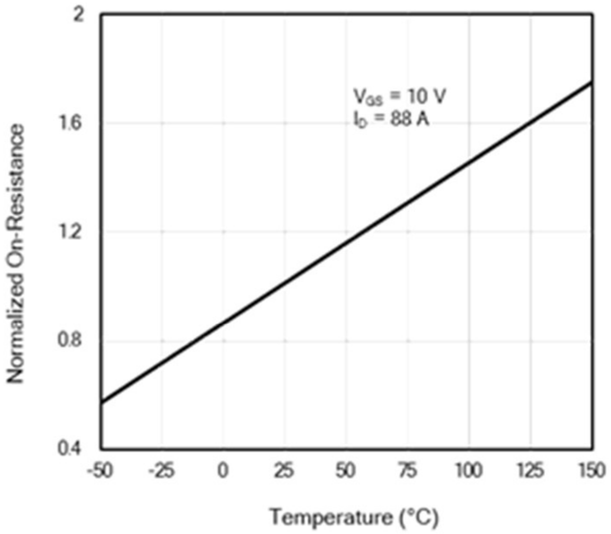


Figure 4: On-Resistance vs. Junction Temperature

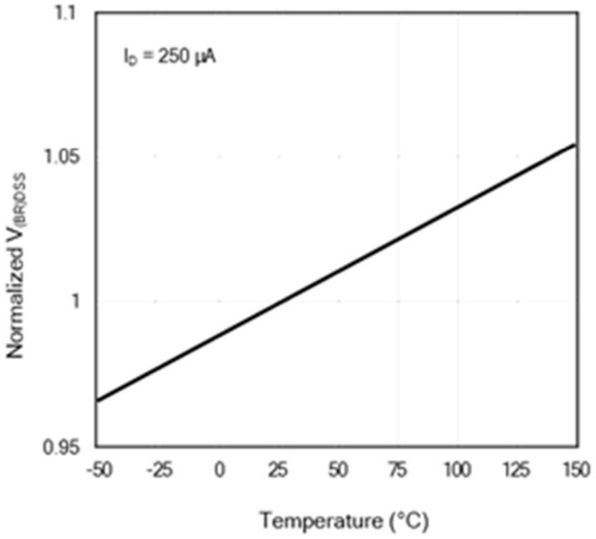


Figure 5: Breakdown Voltage vs. Junction Temperature

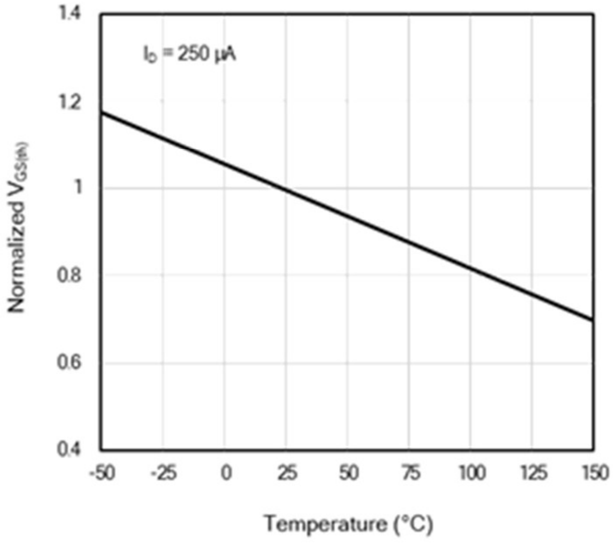


Figure 6: Threshold Voltage vs. Junction Temperature

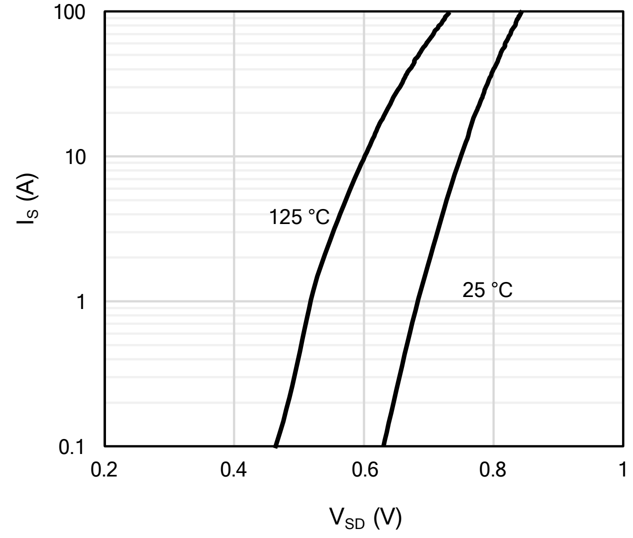


Figure 7: Body-Diode Characteristics

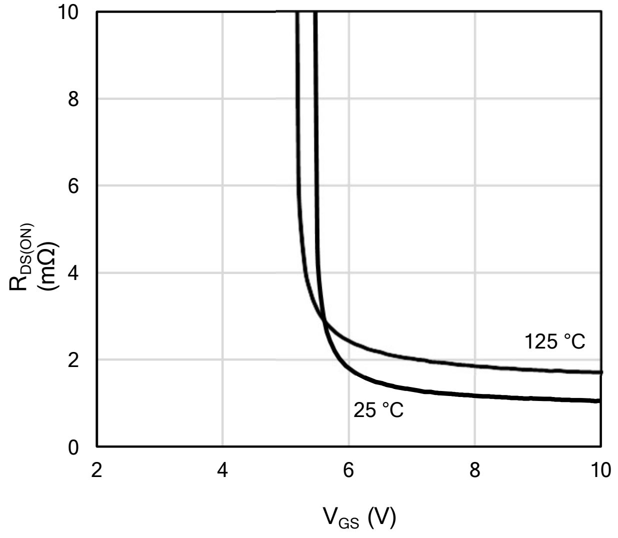


Figure 8: On-Resistance vs. Gate-Source Voltage

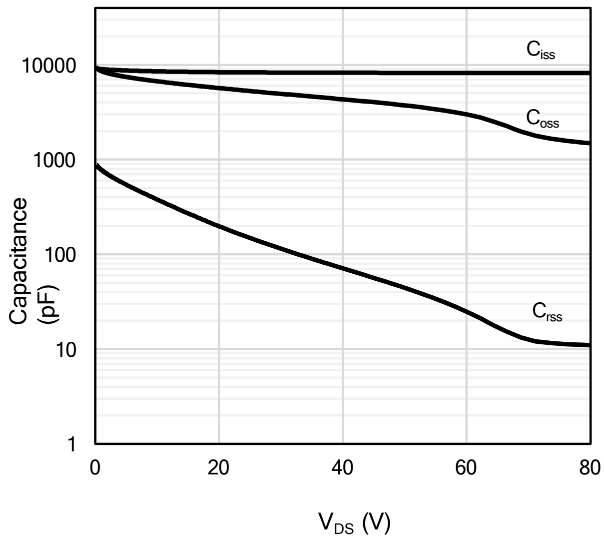


Figure 9: Capacitance Characteristics

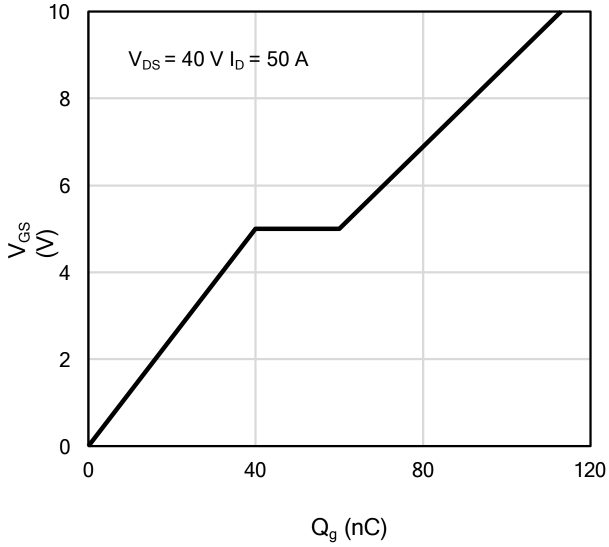


Figure 10: Gate-Charge Characteristics

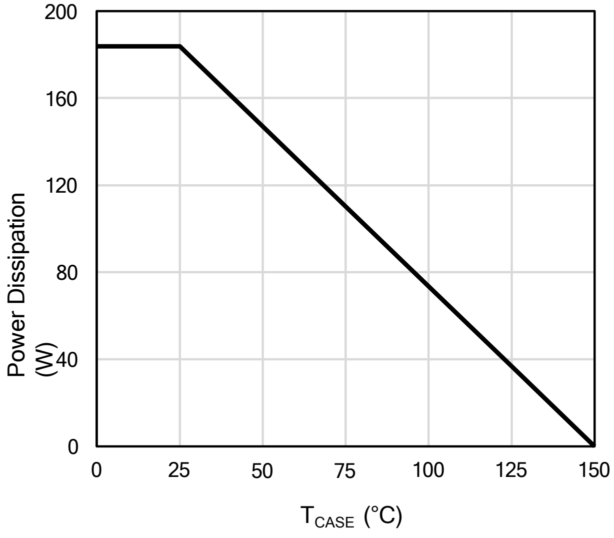


Figure 11: Power De-rating

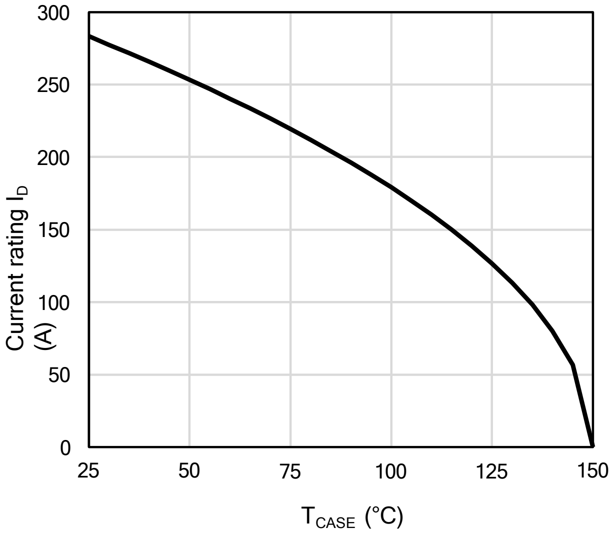


Figure 12: Current De-rating

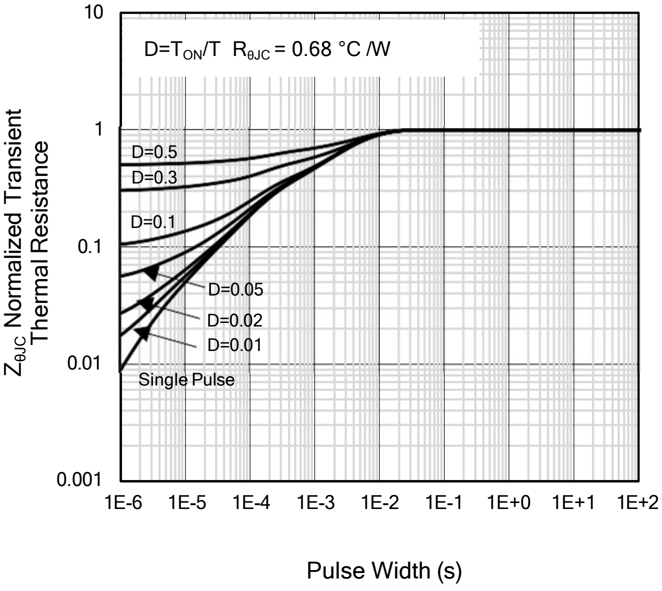


Figure 13: Normalized Maximum Transient Thermal Impedance

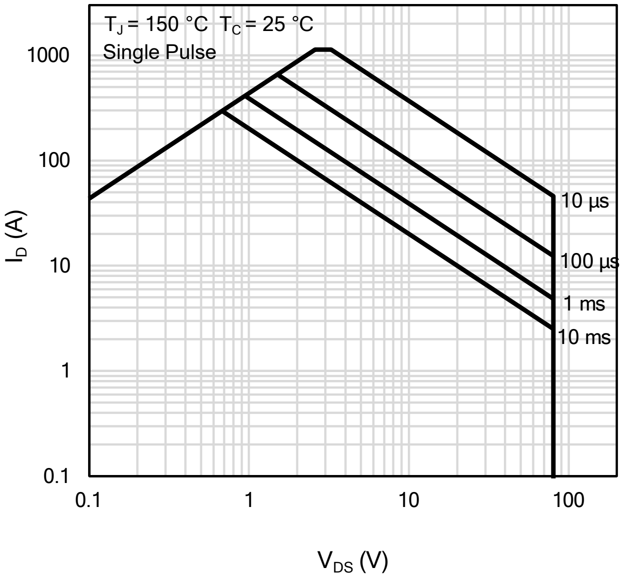
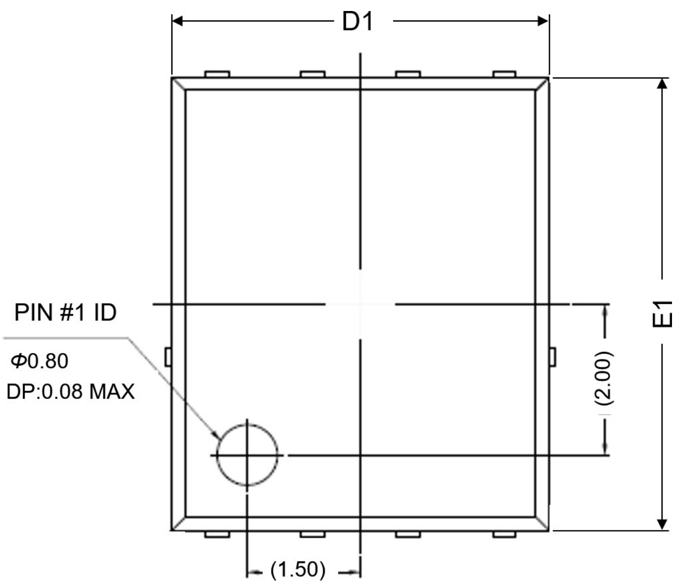
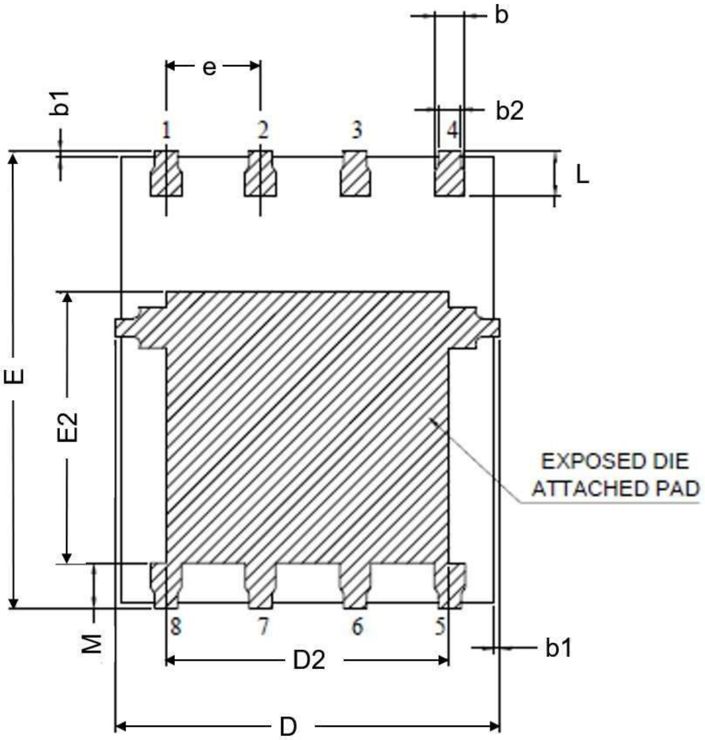
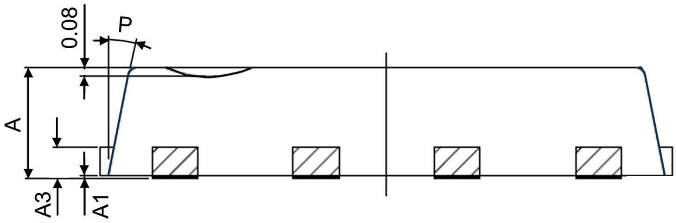


Figure 14: Maximum Forward Biased Safe Operating Area

Package Outline







Symbol	Min	Nom	Max
A	0.95		1.05
A1	0.00		0.05
A3		0.25 REF	
b	0.31		0.51
b1	0.03		0.13
b2	0.21		0.41
D		5.15 BSC	
D1		5.00 BSC	
D2	3.7		3.9
E		6.15 BSC	
E1		6.00 BSC	
E2	3.56		3.76
e		1.27 BSC	
L	0.51		0.71
M	0.51		0.71
P	10°		12°

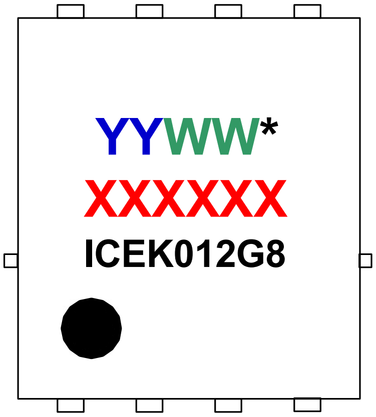
Marking Information

YY = Last two digits of the year

WW = Work week

* = Site ID

XXXXXX = Lot ID



ICEK012G8 = ICE is IceMOS logo and K012G8 is a designated device part number

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