IceMOS Technology

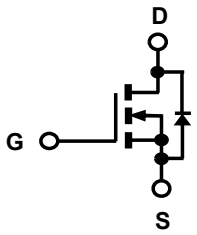
Preliminary
ICEK007GL4LK

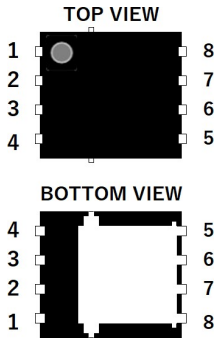
ICEK007GL4LK N-Channel Enhancement Mode MOSFET

Product Summary			
I_D	T_A=25°C	345A	Max
$V_{(BR)DSS}$	I_D=250uA	40V	Min
$r_{DS(on)}$	V_{GS}=10V	0.59mΩ	Typ
Q_g	V_{DS}=20V	92nC	Typ

Features

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





DFN5x6

1-3=Source

4=Gate, 5-8=Drain

RoHS COMPLIANT RoHS (EU) 2015/863

CE

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	345	A
		T_c=100°C	218	
Pulsed drain current [b]	$I_{D, pulse}$	T_c=25°C	1380	A
Avalanche energy, single pulse	E_{AS}	L=0.5mH, V_{DD}=20V, I_D=53A, R_G=50Ω	702	mJ
Avalanche current, repetitive [b]	I_{AR}	limited by $T_j$max	53	A
Gate source voltage	V_{GS}	Static	±20	V
		AC (f>1Hz)		
Power dissipation	P_{tot}	T_c=25°C	138	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}		-	-	0.9	°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						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	40	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1	1.8	3	
Zero gate voltage drain current	I_{DSS}	V_{DS}=40V, 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=50A	-	0.59	0.7	mΩ
Gate resistance	R_G	f=1 MHz, open drain	-	1.85	-	Ω
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}=20V, V_{GS}=0V, f=1 MHz	-	6760	-	pF
Output capacitance	C_{oss}		-	2700	-	
Reverse transfer capacitance	C_{rss}		-	67	-	
Turn-on delay time	$t_{d(on)}$	V_{DS}=20V, R_L=1Ω, V_{GS}=10V, R_G=1.1Ω (External)	-	15	-	ns
Rise time	t_r		-	38	-	
Turn-off delay time	$t_{d(off)}$		-	46	-	
Fall time	t_f		-	14	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DS}=20V, I_D=50A, V_{GS}=0 to 10V	-	18	-	nC
Gate to drain charge	Q_{gd}		-	16	-	
Gate charge total	Q_g		-	92	-	
Reverse Diode						
Continuous forward current	I_S	V_{GS}=0V	-	-	345	A
Diode forward voltage	V_{SD}	V_{GS}=0V, I_S=50A	-	0.75	-	V
Reverse recovery time	t_{rr}	V_{RR}=20V, I_S=20A, d_{iF}/d_t=100 A/μS	-	85	-	ns
Reverse recovery charge	Q_{rr}		-	135	-	nC
Peak reverse recovery current	I_{rm}		-	2.6	-	A

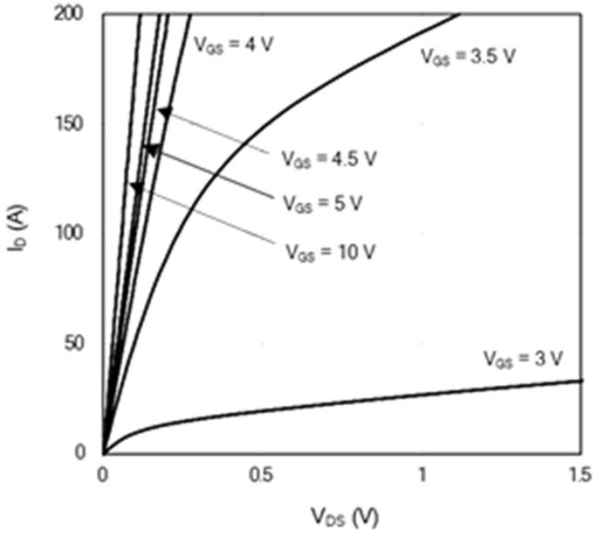


Figure 1: On-Region Characteristics

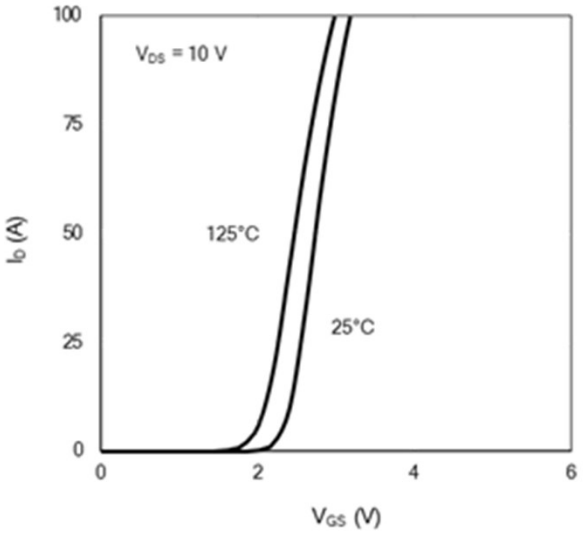


Figure 2: Transfer Characteristics

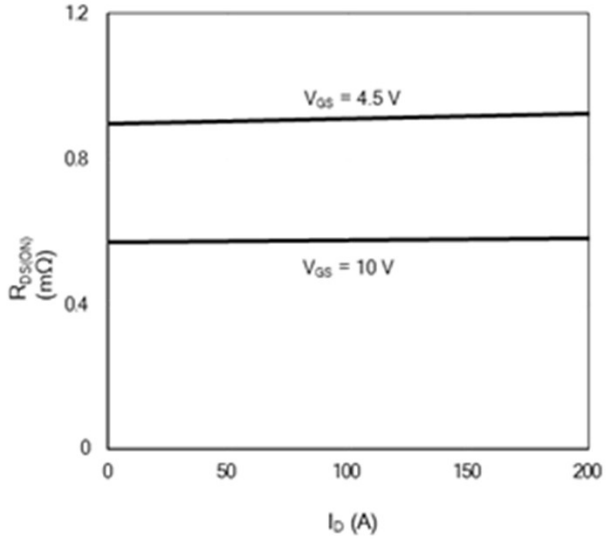


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

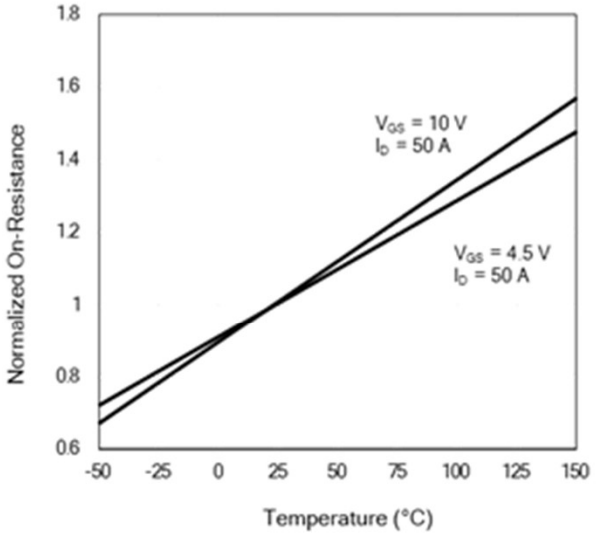


Figure 4: On-Resistance vs. Junction Temperature

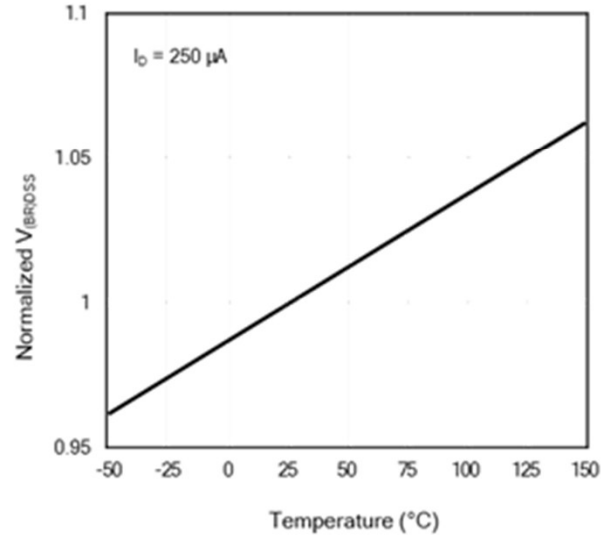


Figure 5: Breakdown Voltage vs. Junction Temperature

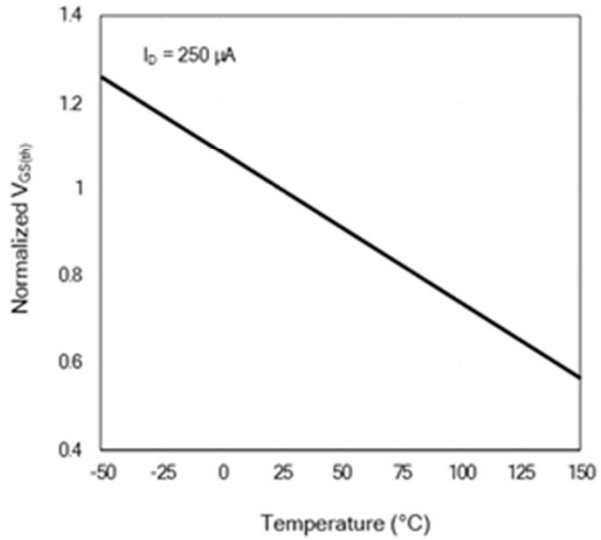


Figure 6: Threshold Voltage vs. Junction Temperature

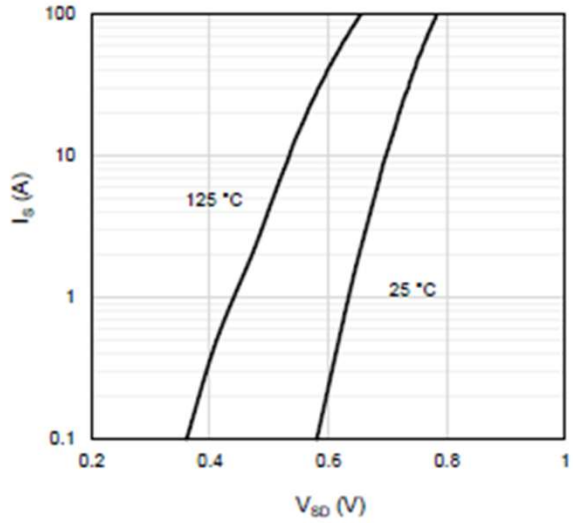


Figure 7: Body-Diode Characteristics

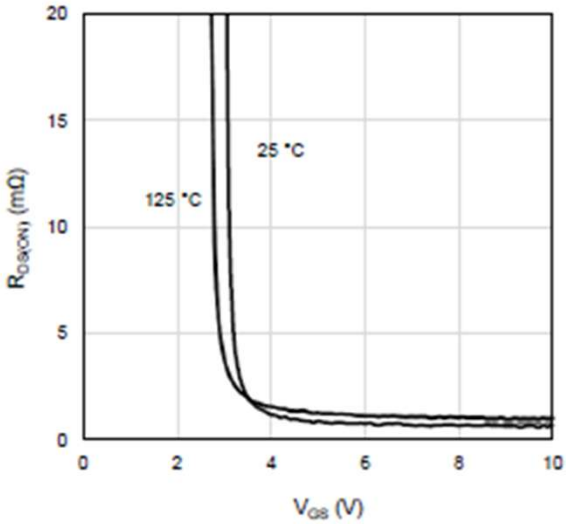


Figure 8: On-Resistance vs. Gate-Source Voltage

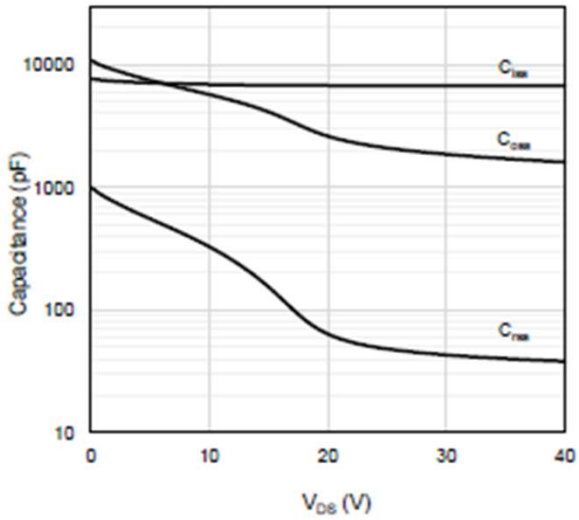


Figure 9: Capacitance Characteristics

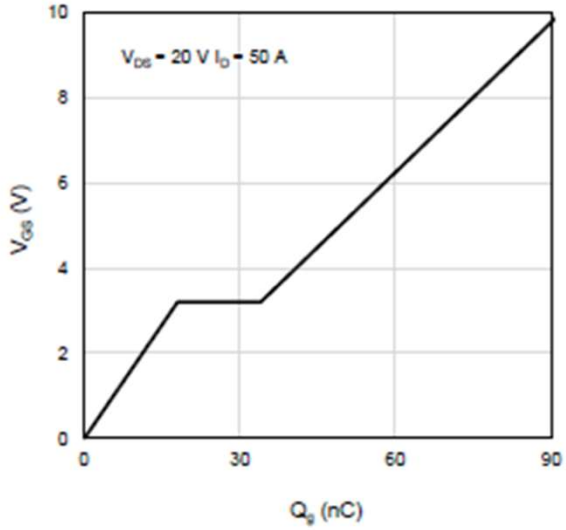


Figure 10: Gate-Charge Characteristics

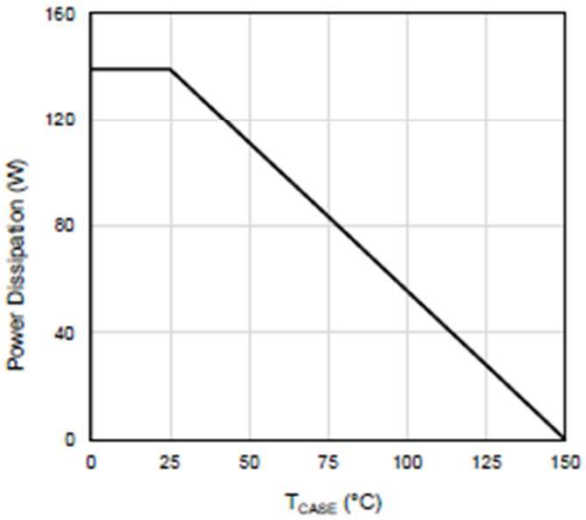


Figure 11: Power De-rating

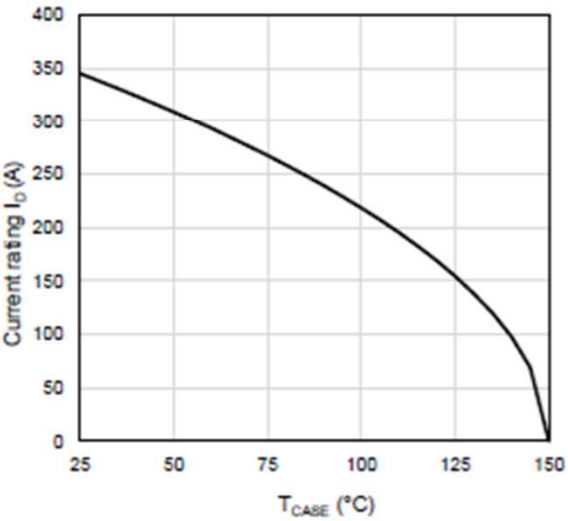


Figure 12: Current De-rating

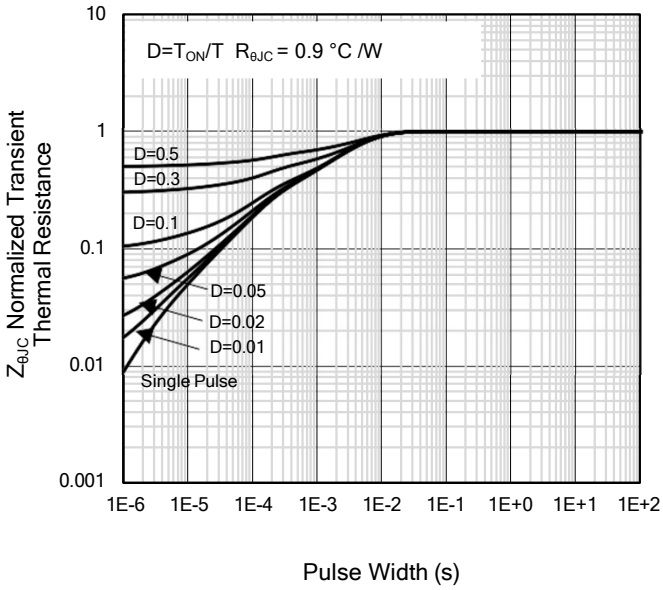


Figure 13: Normalized Maximum Transient Thermal Impedance

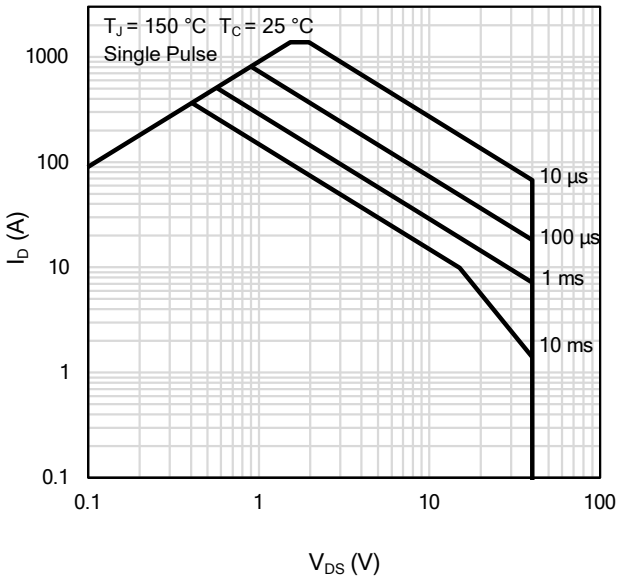
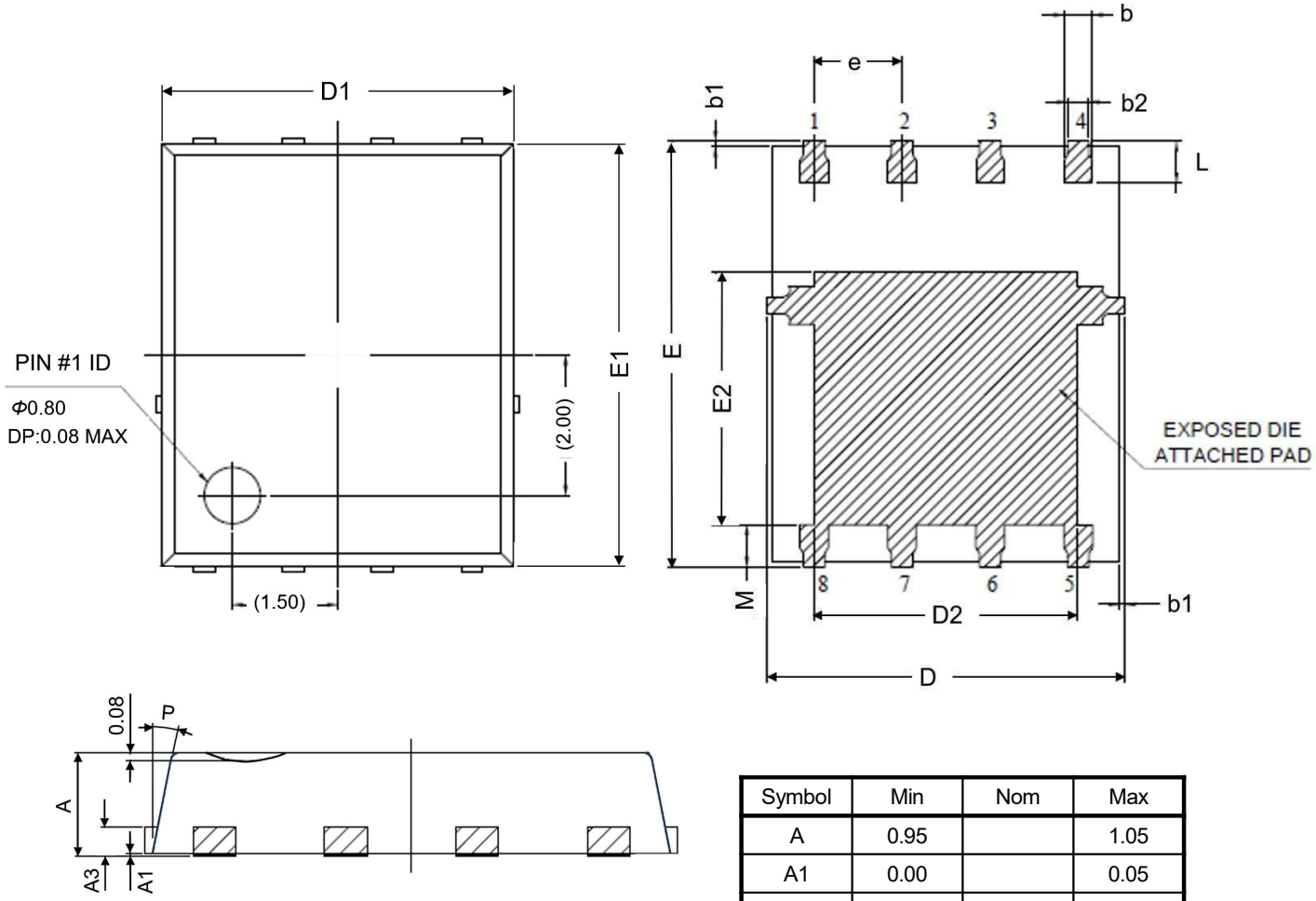


Figure 14: Maximum Forward Biased Safe Operating Area

Package Outline



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°

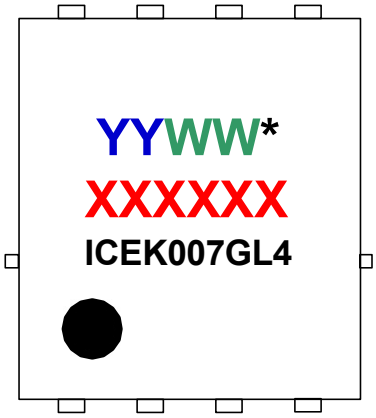
Marking Information

YY = Last two digits of the year

WW = Work week

* = Site ID

XXXXXX = Lot ID



ICEK007GL4 = ICE is IceMOS logo and K007GL4 is a designated device part number

Disclaimer