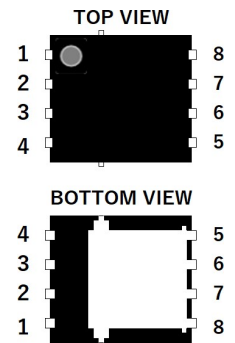
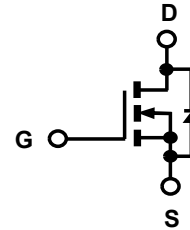


ICEK046GL10LK N-Channel Enhancement Mode MOSFET

Features

- Very low on-resistance ($R_{DS(on)}$)
- Superior switching performance
- Optimized design for Motor Drivers and DC-DC Converter

Product Summary			
I_D	$T_A=25^\circ\text{C}$	113.6A	Max
$V_{(BR)DSS}$	$I_D=250\mu\text{A}$	100V	Min
$r_{DS(on)}$	$V_{GS}=10\text{V}$	3.8m Ω	Typ
Q_g	$V_{DS}=50\text{V}$	38nC	Typ



DFN5x6

1-3=Source

4=Gate, 5-8=Drain



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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current ^b	I_D	$T_c=25^\circ\text{C}$	113.6	A
		$T_c=100^\circ\text{C}$	71.9	
Pulsed drain current ^b	$I_{D, \text{pulse}}$	$T_c=25^\circ\text{C}$	460	A
Avalanche energy, single pulse	E_{AS}	$L=0.5\text{mH}$, $V_{DD}=50\text{V}$, $I_D=25\text{A}$, $R_G=50\Omega$	156	mJ
Avalanche current, repetitive ^b	I_{AR}	limited by $T_{j\text{max}}$	25	A
Gate source voltage	V_{GS}	Static	± 20	V
		AC ($f>1\text{Hz}$)		
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	104	W
Operating and storage temperature	T_j, T_{stg}		-55 to +150	$^\circ\text{C}$

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}		-	-	1.2	°C/W
Thermal resistance, junction-ambient °	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 $T_j=25^{\circ}\text{C}$, unless otherwise specified

Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	2	3	
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	$R_{DS(on)}$	$V_{GS}=10V, I_D=40A$	-	3.8	4.6	m Ω
Gate resistance	R_G	$f=1\text{ MHz}$, open drain	-	1	-	Ω

Dynamic characteristics

Input capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1\text{ MHz}$	-	2510	-	pF
Output capacitance	C_{oss}		-	1280	-	
Reverse transfer capacitance	C_{rss}		-	16	-	
Turn-on delay time	$t_{d(on)}$	$V_{DS}=50V, R_L=1.2\Omega, V_{GS}=10V, R_G=3.3\Omega$ (External)	-	11	-	ns
Rise time	t_r		-	38	-	
Turn-off delay time	$t_{d(off)}$		-	28	-	
Fall time	t_f		-	8	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

Gate charge characteristics

Gate to source charge	Q_{gs}	$V_{DS}=50V, I_D=40A,$ $V_{GS}=0 \text{ to } 10V$	-	6	-	nC
Gate to drain charge	Q_{gd}		-	9	-	
Gate charge total	Q_g		-	38	-	

Reverse Diode

Continuous forward current	I_S	$V_{GS}=0V$	-	-	113.6	A
Diode forward voltage	V_{SD}	$V_{GS}=0V, I_S=40A$	-	0.86	-	V
Reverse recovery time	t_{rr}	$V_{RR}=50V, I_S=40A,$ $d_{iF}/d_t=100 \text{ A}/\mu\text{S}$	-	65	-	ns
Reverse recovery charge	Q_{rr}		-	118	-	nC
Peak reverse recovery current	I_{rm}		-	3.05	-	A

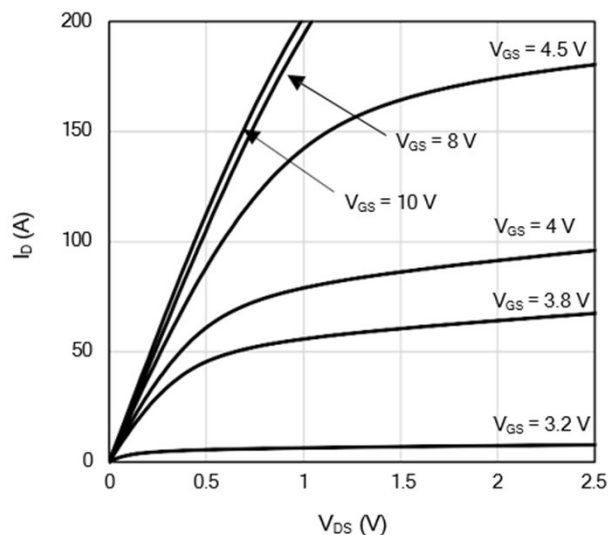


Figure 1: On-Region Characteristics

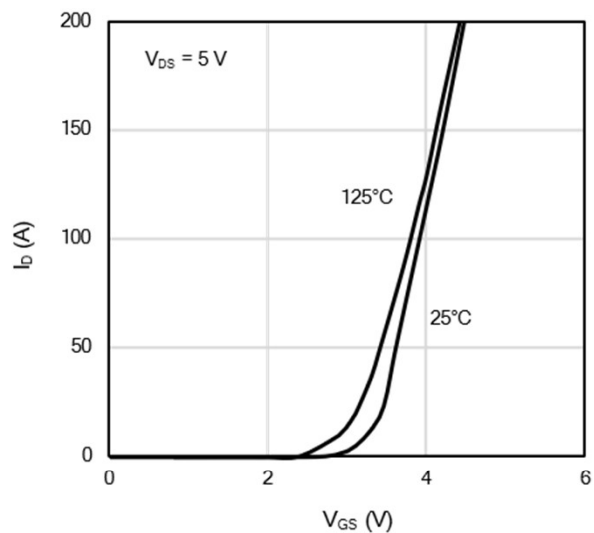


Figure 2: Transfer Characteristics

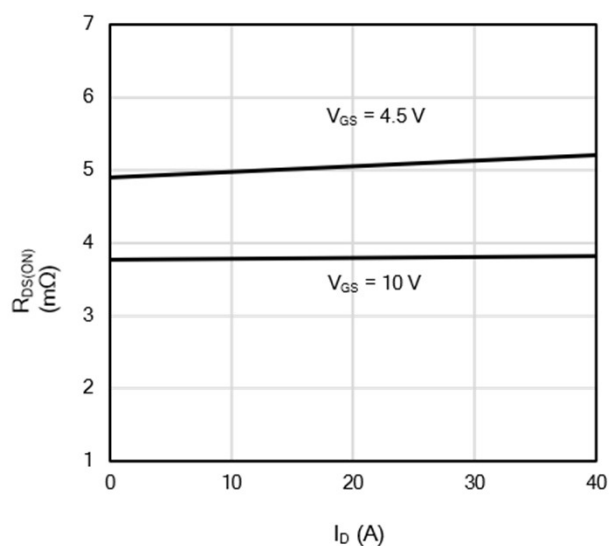


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

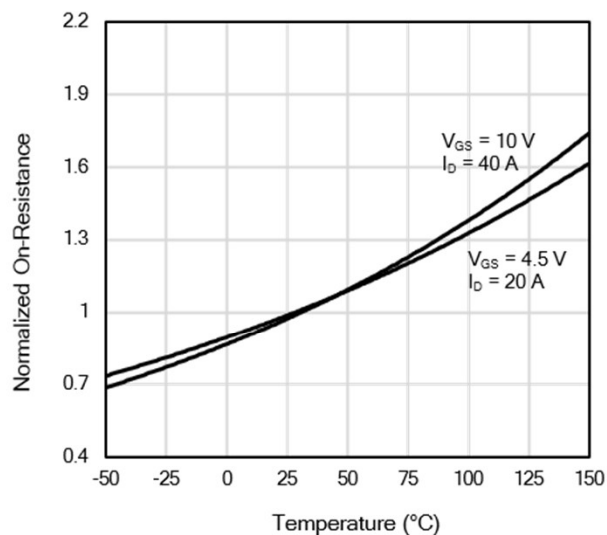


Figure 4: On-Resistance vs. Junction Temperature

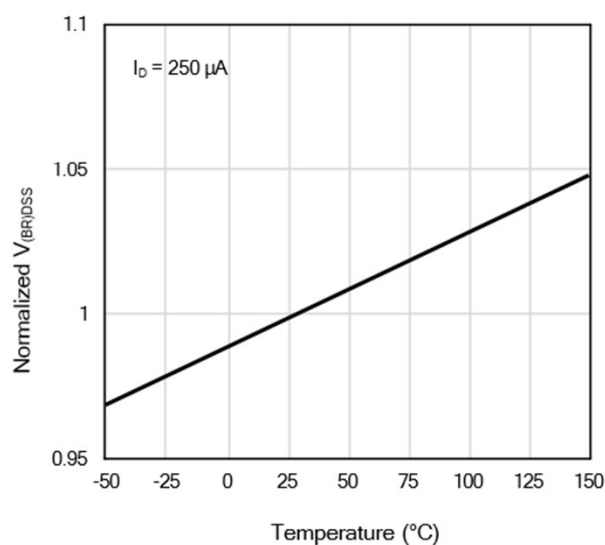


Figure 5: Breakdown Voltage vs. Junction Temperature

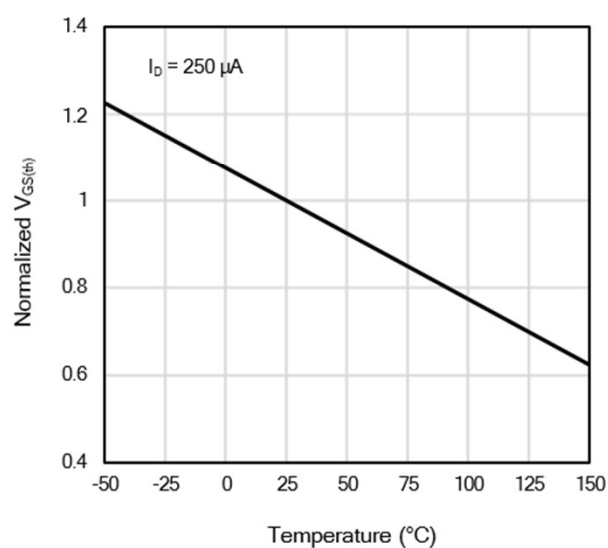


Figure 6: Threshold Voltage vs. Junction Temperature

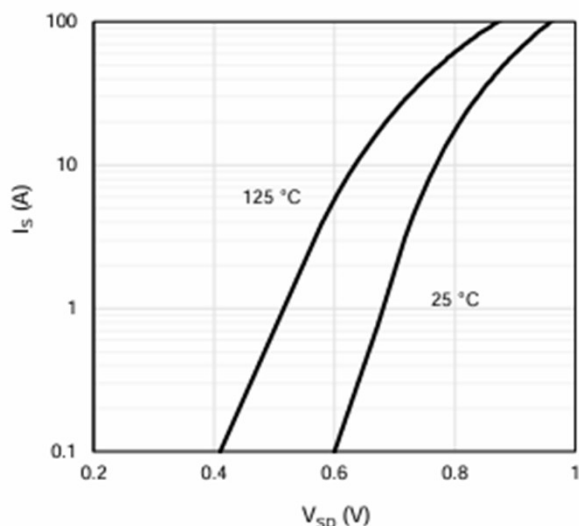


Figure 7: Body-Diode Characteristics

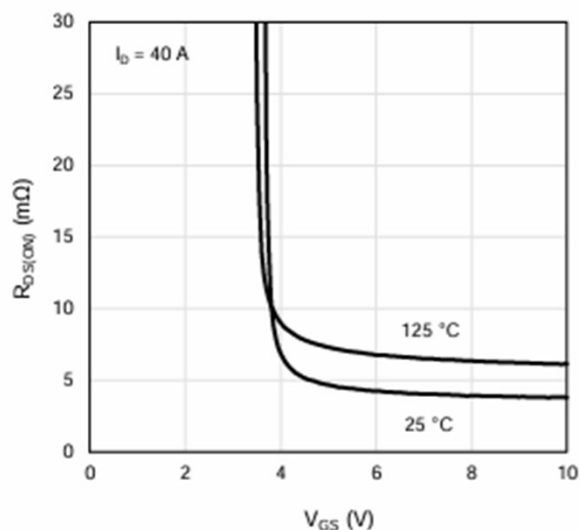


Figure 8: On-Resistance vs. Gate-Source Voltage

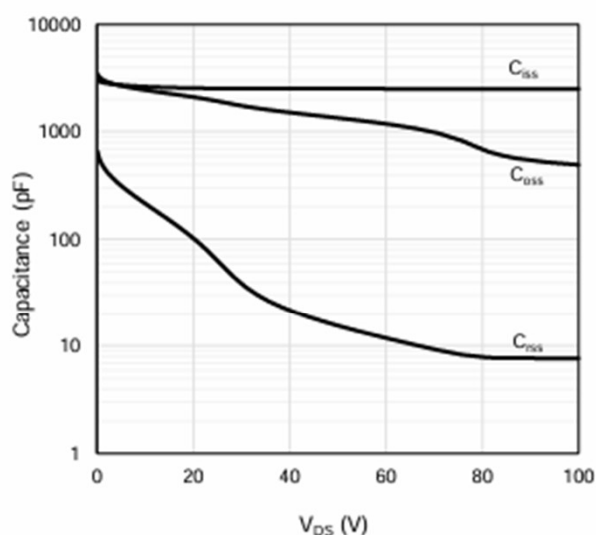


Figure 9: Capacitance Characteristics

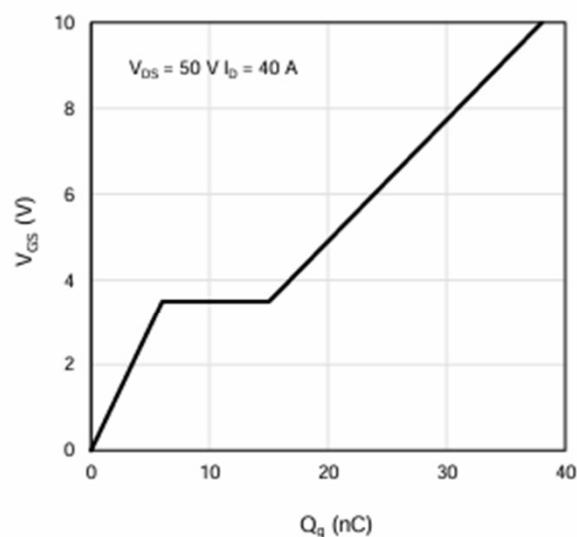


Figure 10: Gate-Charge Characteristics

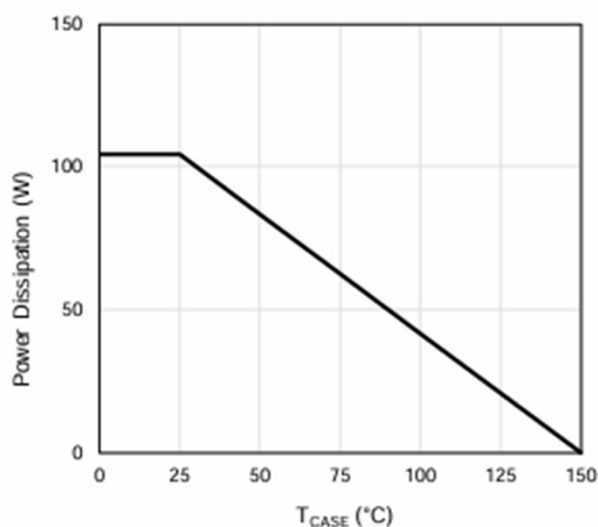


Figure 11: Power De-rating

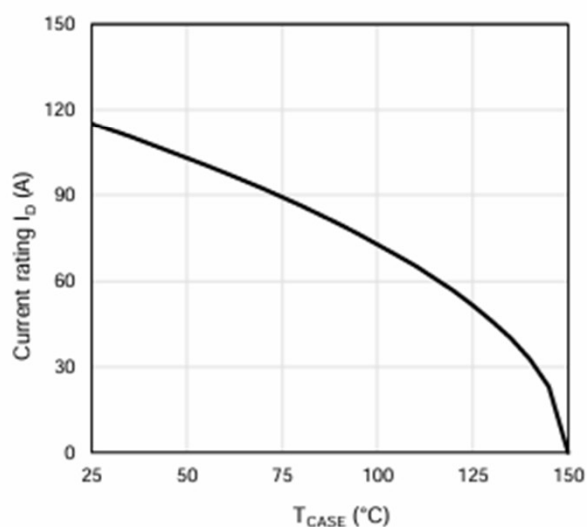


Figure 12: Current De-rating

Preliminary ICEK046GL10LK

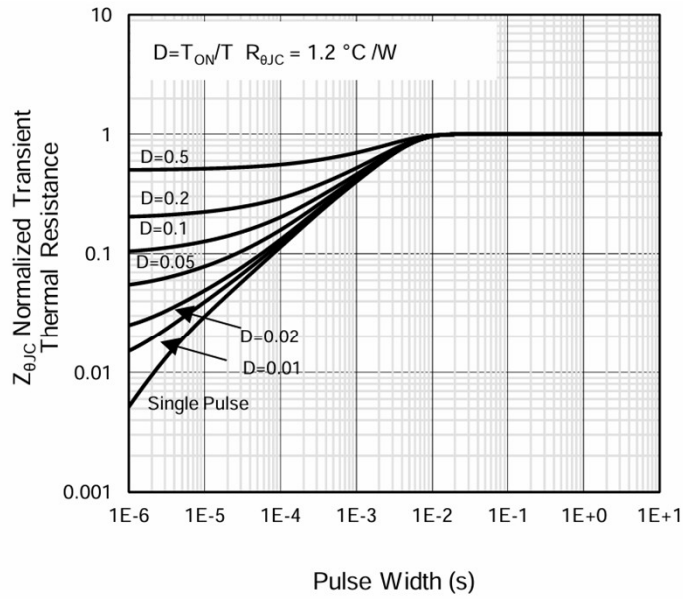


Figure 13: Normalized Maximum Transient Thermal Impedance

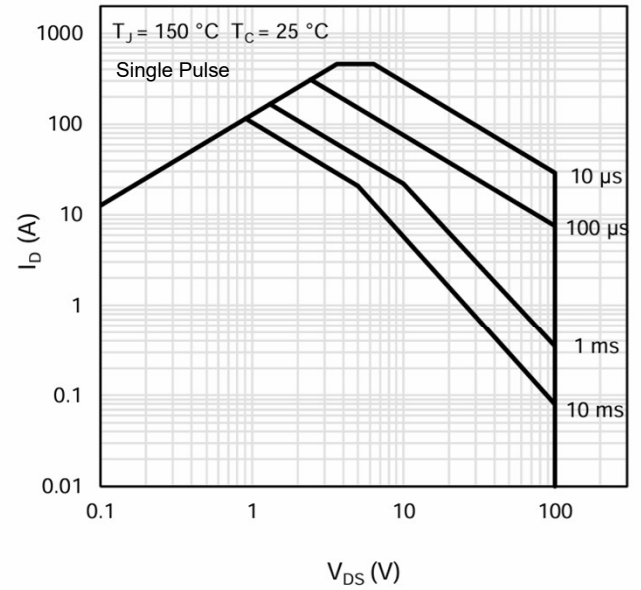
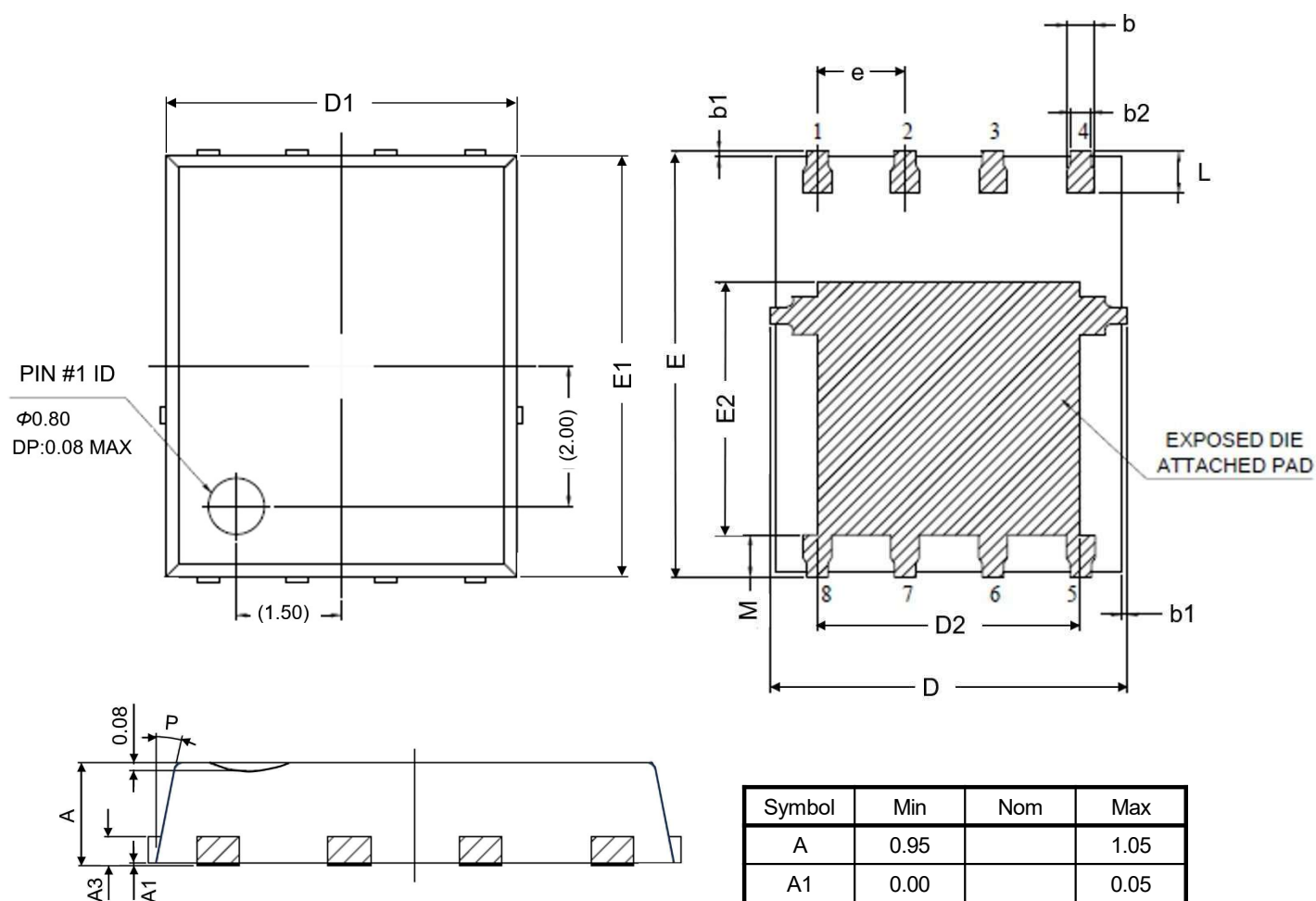


Figure 14: Maximum Forward Biased Safe Operating Area

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°

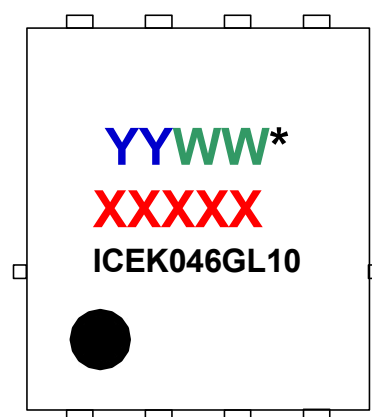
Marking Information

YY = Last two digits of the year

WW = Work week

***** = Site ID

XXXXXX = Lot ID



ICEK046GL10 = ICE is IceMOS logo and
K046GL10 is a designated device part
number

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