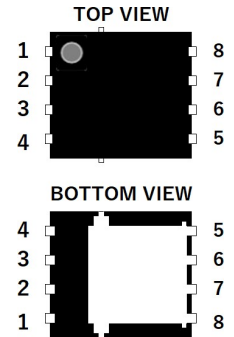
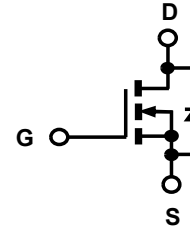


## ICEK092GL6LK N-Channel Enhancement Mode MOSFET

### Features

- Low  $r_{DS(on)}$
- Low switching loss
- 100% UIS Tested
- Optimized designs for Motor Drivers and DC-DC Converter

Product Summary			
$I_D$	$T_A=25^\circ\text{C}$	53A	Max
$V_{(BR)DSS}$	$I_D=250\mu\text{A}$	60V	Min
$r_{DS(on)}$	$V_{GS}=10\text{V}$	7.4m $\Omega$	Typ
$Q_g$	$V_{DS}=30\text{V}$	22nC	Typ



DFN5x6

1-3=Source

4=Gate, 5-8=Drain



**Maximum ratings**<sup>a</sup> at  $T_j=25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current <sup>b</sup>	$I_D$	$T_c=25^\circ\text{C}$	53	A
		$T_c=100^\circ\text{C}$	33	
Pulsed drain current <sup>b</sup>	$I_{D, pulse}$	$T_c=25^\circ\text{C}$	212	A
Avalanche energy, single pulse	$E_{AS}$	$L=0.5\text{mH}$ , $V_{DD}=30\text{V}$ , $I_D=13\text{A}$ , $R_G=50\Omega$	42	mJ
Avalanche current, repetitive <sup>b</sup>	$I_{AR}$	limited by $T_j\text{max}$	13	A
Gate source voltage	$V_{GS}$	Static	$\pm 20$	V
		AC ( $f > 1\text{Hz}$ )		
Power dissipation	$P_{tot}$	$T_c=25^\circ\text{C}$	46.2	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  $T_{jmax}$

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	$R_{thJC}$		-	-	2.7	°C/W
Thermal resistance, junction-ambient °	$R_{thJA}$	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 $T_j=25^{\circ}\text{C}$ , unless otherwise specified

#### Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.9	3	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$	-	-	1	$\mu A$
Gate source leakage current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	-	7.4	9.2	m $\Omega$
Gate resistance	$R_G$	$f=1\text{ MHz}$ , open drain	-	1	-	$\Omega$

#### Dynamic characteristics

Input capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, f=1\text{ MHz}$	-	1110	-	pF
Output capacitance	$C_{oss}$		-	295	-	
Reverse transfer capacitance	$C_{rss}$		-	28	-	
Turn-on delay time	$t_{d(on)}$	$V_{DS}=30V, R_L=1.5\Omega, V_{GS}=10V, R_G=6\Omega$ (External)	-	7	-	ns
Rise time	$t_r$		-	26	-	
Turn-off delay time	$t_{d(off)}$		-	23	-	
Fall time	$t_f$		-	10	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

### Gate charge characteristics

Gate to source charge	$Q_{gs}$	$V_{DS}=30V, I_D=20A,$ $V_{GS}=0$ to $10V$	-	3.5	-	nC
Gate to drain charge	$Q_{gd}$		-	6.5	-	
Gate charge total	$Q_g$		-	22	-	

### Reverse Diode

Continuous forward current	$I_S$	$V_{GS}=0V$	-	-	53	A
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=25A$	-	0.9	-	V
Reverse recovery time	$t_{rr}$	$V_{RR}=30V, I_S=20A,$ $d_{iF}/d_t=100 A/\mu S$	-	30	-	ns
Reverse recovery charge	$Q_{rr}$		-	23	-	nC
Peak reverse recovery current	$I_{rm}$		-	1.4	-	A

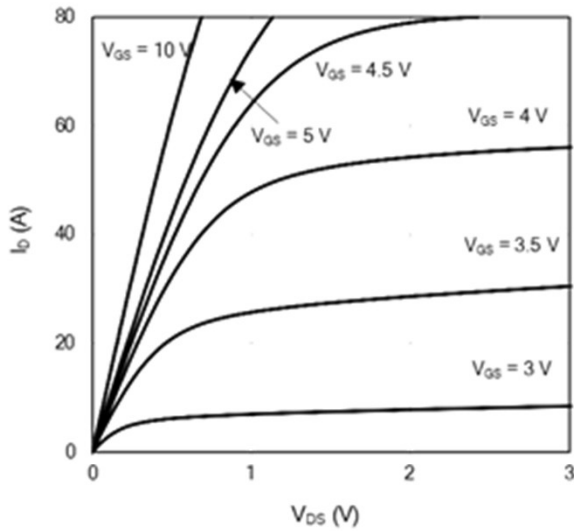


Figure 1: On-Region Characteristics

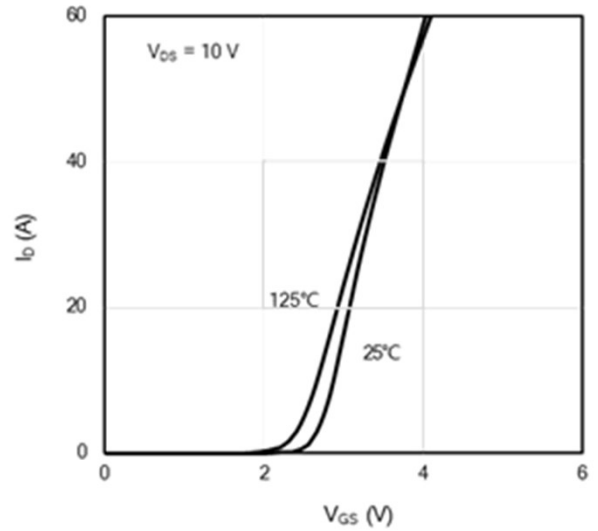


Figure 2: Transfer Characteristics

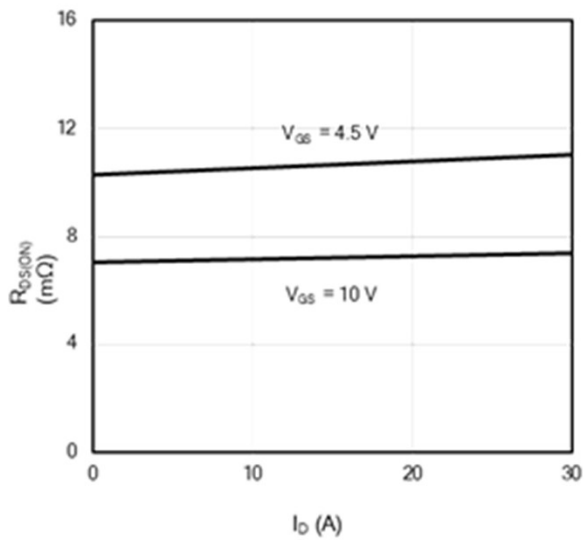


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

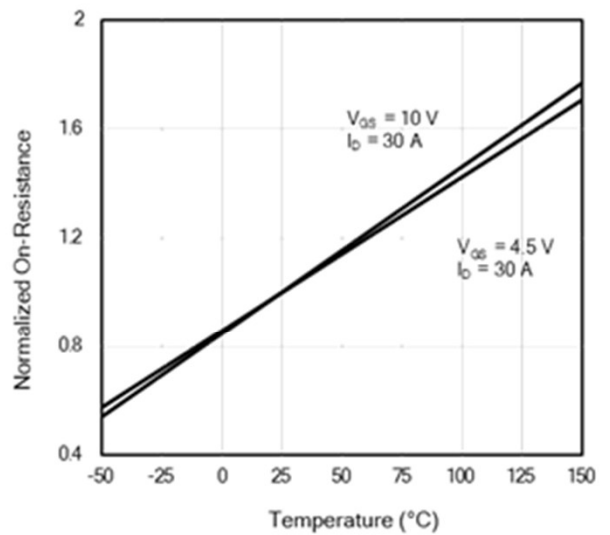


Figure 4: On-Resistance vs. Junction Temperature

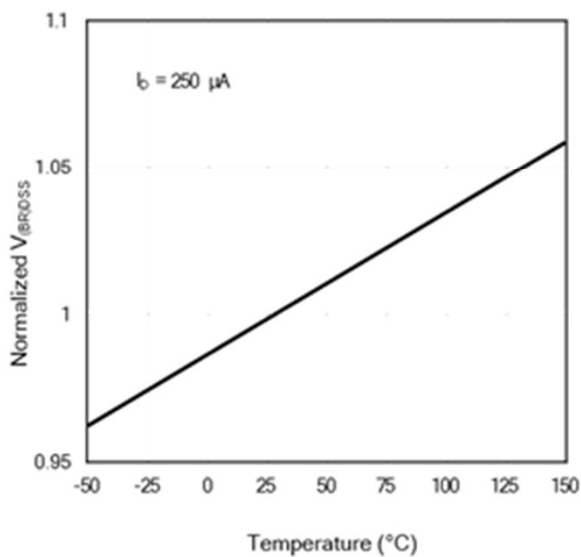


Figure 5: Breakdown Voltage vs. Junction Temperature

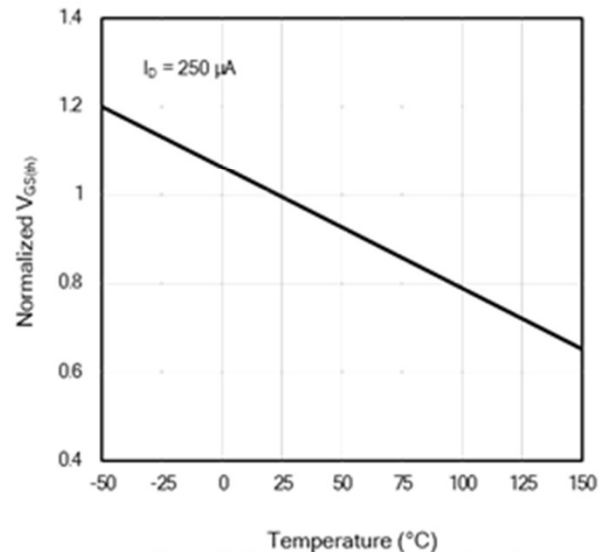


Figure 6: Threshold Voltage vs. Junction Temperature

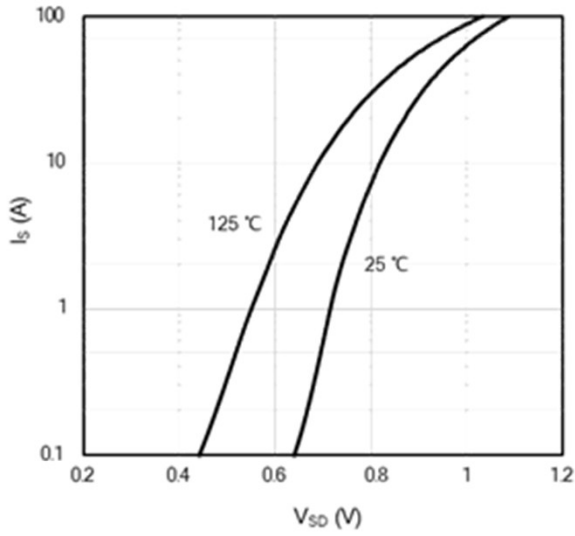


Figure 7: Body-Diode Characteristics

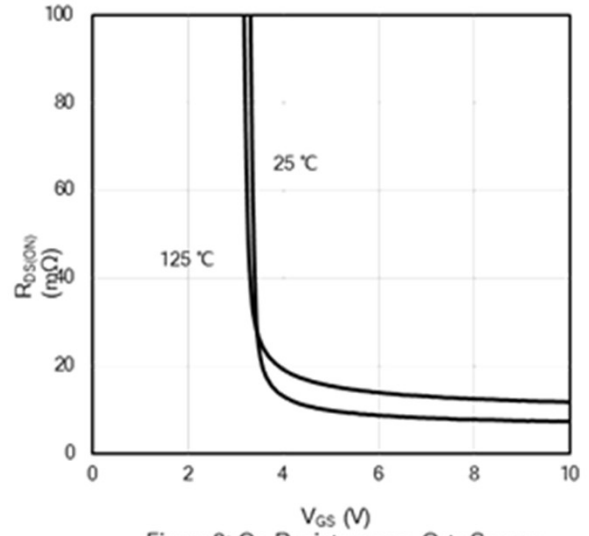


Figure 8: On-Resistance vs. Gate-Source Voltage

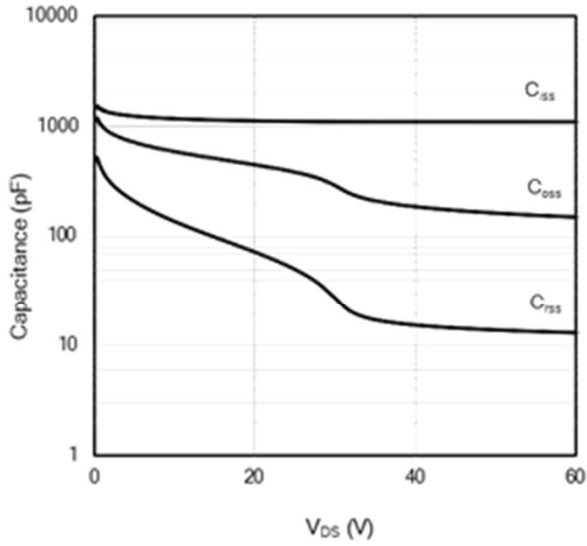


Figure 9: Capacitance Characteristics

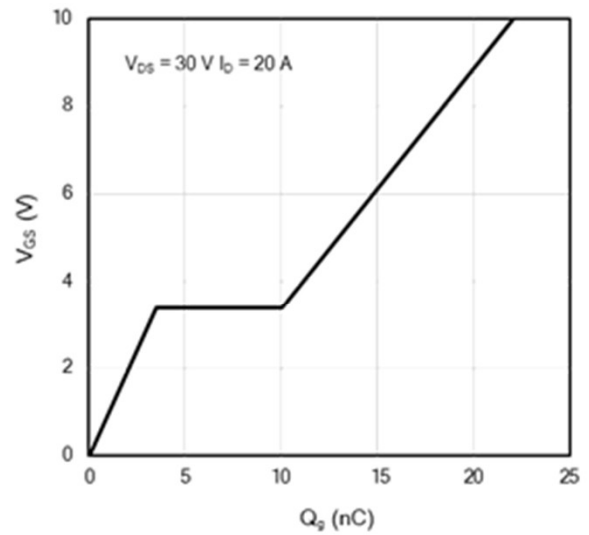


Figure 10: Gate-Charge Characteristics

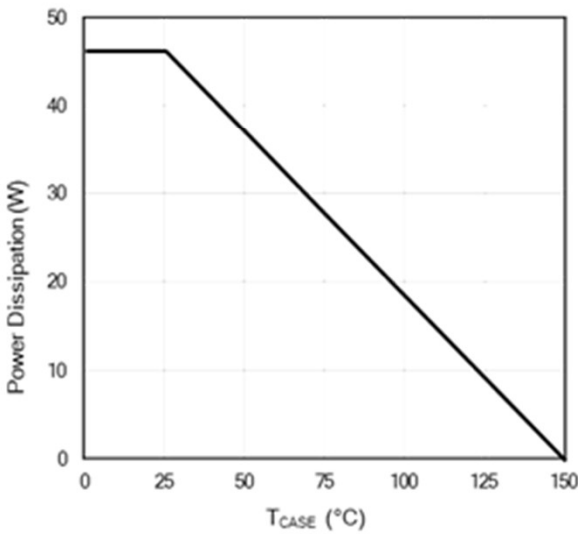


Figure 11: Power De-rating

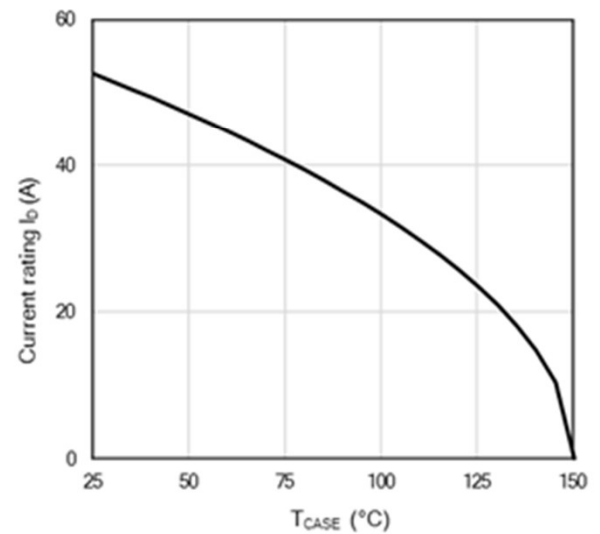


Figure 12: Current De-rating

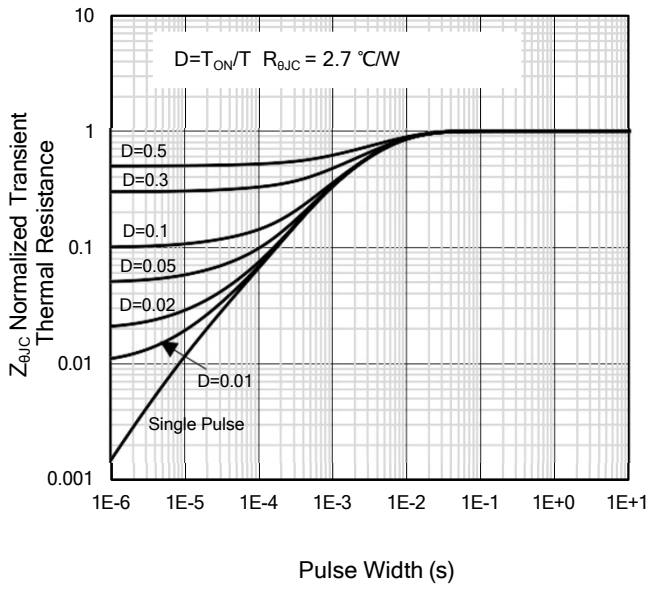


Figure 13: Normalized Maximum Transient Thermal Impedance

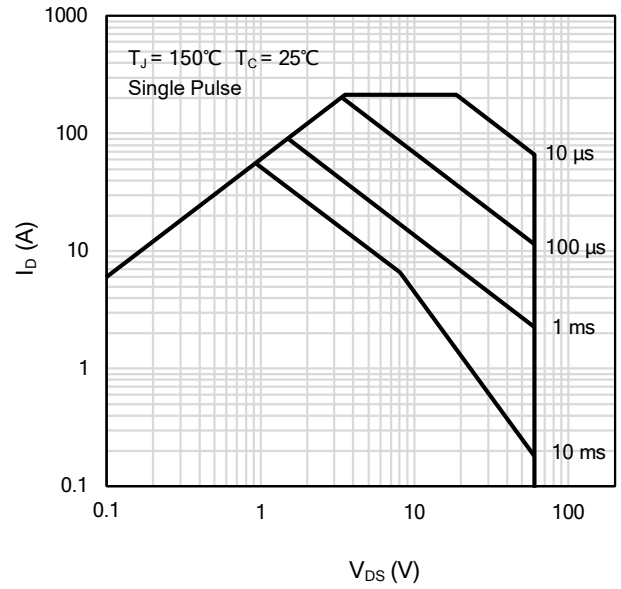
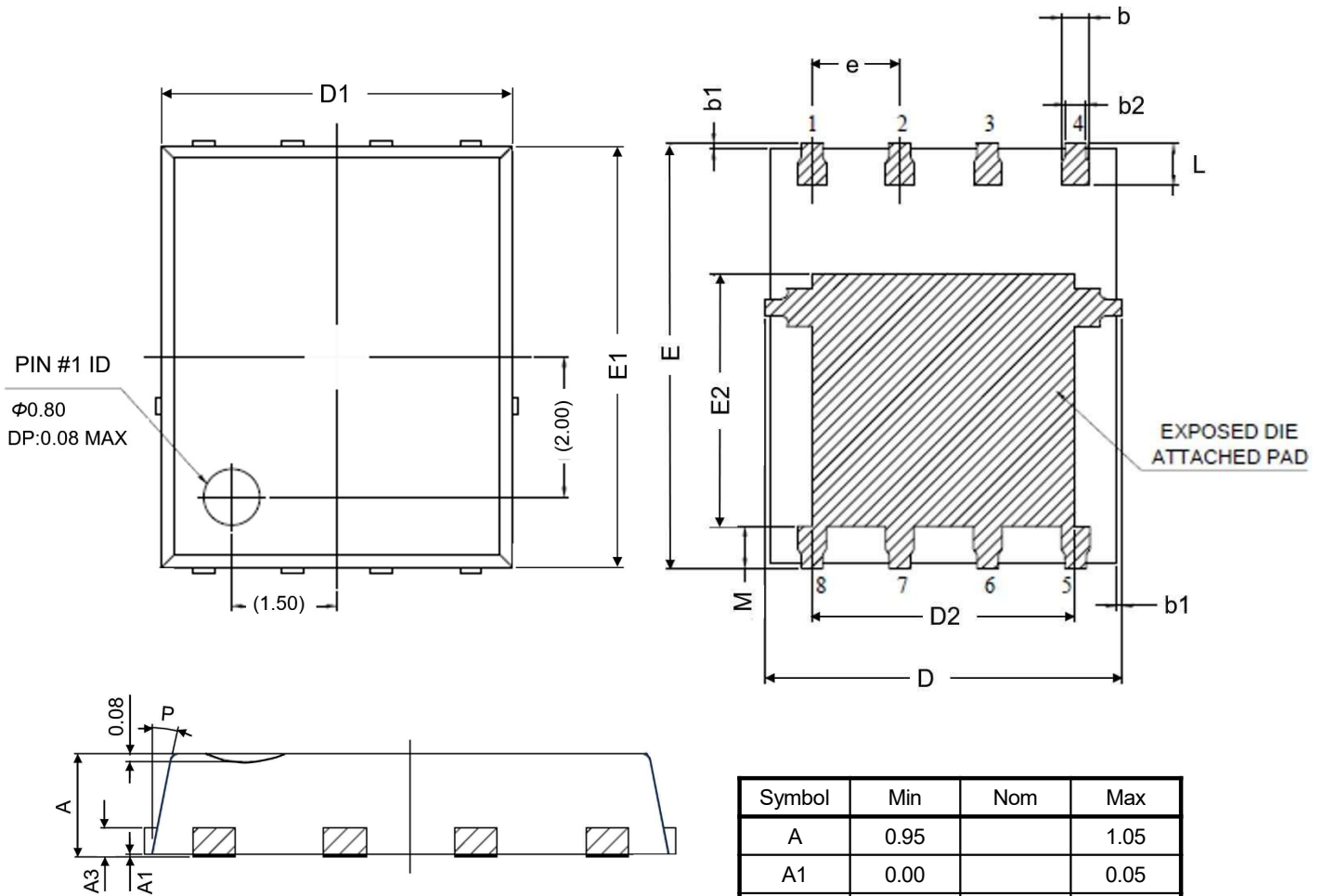


Figure 14: Maximum Forward Biased Safe Operating Area

## 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°

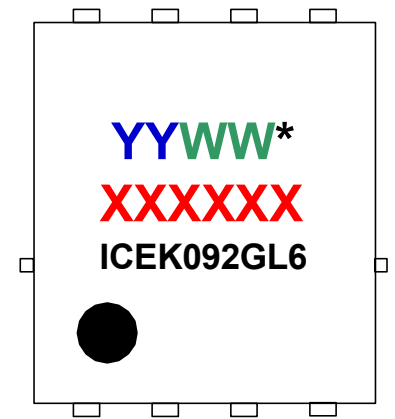
## Marking Information

**YY** = Last two digits of the year

**WW** = Work week

**\*** = Site ID

**XXXXXX** = Lot ID



**ICEK092GL6** = ICE is IceMOS logo and  
K092GL6 is a designated device part  
number

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