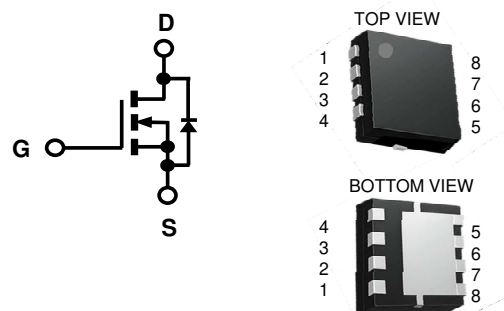


ICEK070GL6LS N-Channel Enhancement Mode MOSFET

Features

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

Product Summary			
I_D	$T_A=25^\circ\text{C}$	36A	Max
$V_{(BR)DSS}$	$I_D=250\mu\text{A}$	60V	Min
$r_{DS(on)}$	$V_{GS}=10\text{V}$	5.3m Ω	Typ
Q_g	$V_{DS}=30\text{V}$	32nC	Typ



DFN3.3x3.3

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	$T_c=25^\circ\text{C}$	36	A
		$T_c=100^\circ\text{C}$	30	
Pulsed drain current ^b	$I_{D, \text{pulse}}$	$T_c=25^\circ\text{C}$	144	A
Avalanche energy, single pulse	E_{AS}	$L=0.5\text{mH}$, $V_{DD}=30\text{V}$, $I_D=19\text{A}$, $R_G=50\Omega$	90	mJ
Avalanche current, repetitive ^b	I_{AR}	limited by $T_j\text{max}$	19	A
Gate source voltage	V_{GS}	Static	± 20	V
		AC ($f>1\text{Hz}$)		
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	29.7	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}		-	-	4.2	°C/W
Thermal resistance, junction-ambient °	R_{thJA}	leaded	-	-	56	
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	2	3	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	5.3	7	m Ω
Gate resistance	R_G	$f=1\text{ MHz}$, open drain	-	1.5	-	Ω

Dynamic characteristics

Input capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, f=1\text{ MHz}$	-	2013	-	pF
Output capacitance	C_{oss}		-	492	-	
Reverse transfer capacitance	C_{rss}		-	34	-	
Turn-on delay time	$t_{d(on)}$	$V_{DS}=30V, R_L=1.5\Omega, V_{GS}=10V, R_G=6\Omega$ (External)	-	16	-	ns
Rise time	t_r		-	89	-	
Turn-off delay time	$t_{d(off)}$		-	47.5	-	
Fall time	t_f		-	111	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

Gate charge characteristics

Gate to source charge	Q_{gs}	$V_{DS}=30V, I_D=20A,$ $V_{GS}=0 \text{ to } 10V$	-	4.3	-	nC
Gate to drain charge	Q_{gd}		-	5.2	-	
Gate charge total	Q_g		-	32	-	

Reverse Diode

Continuous forward current	I_S	$V_{GS}=0V$	-	-	36	A
Diode forward voltage	V_{SD}	$V_{GS}=0V, I_S=1A$	-	0.7	-	V
Reverse recovery time	t_{rr}	$V_{RR}=30V, I_S=20A,$ $d_{iF}/d_t=100 \text{ A}/\mu\text{S}$	-	38	-	ns
Reverse recovery charge	Q_{rr}		-	41	-	nC
Peak reverse recovery current	I_{rm}		-	1.9	-	A

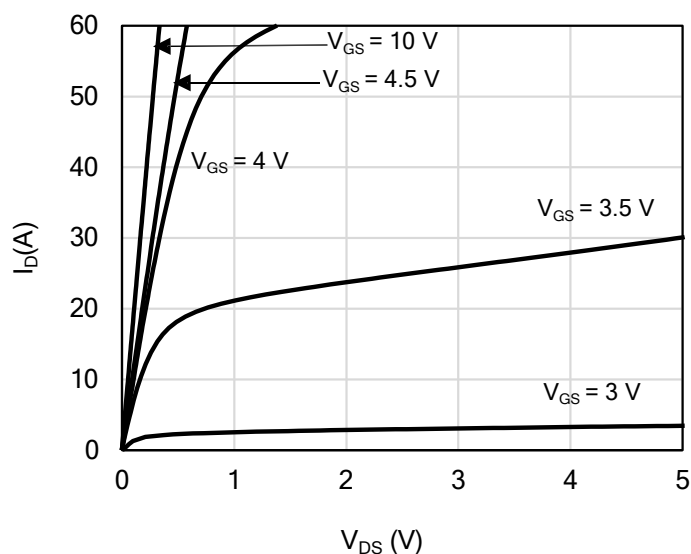


Figure 1: On-Region Characteristics

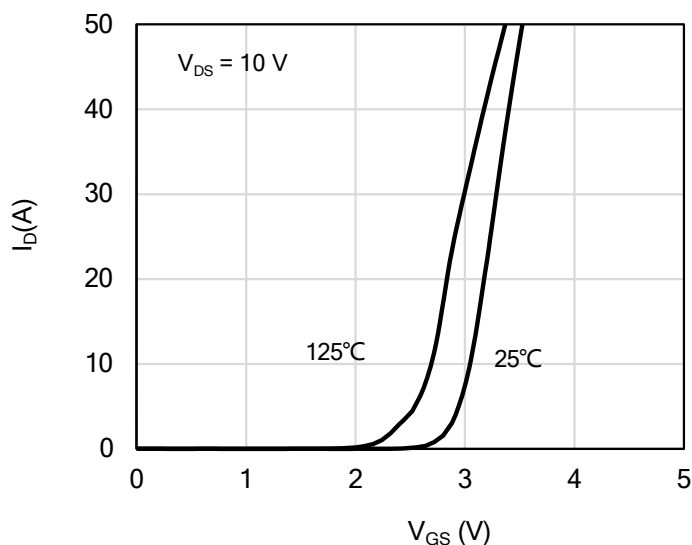


Figure 2: Transfer Characteristics

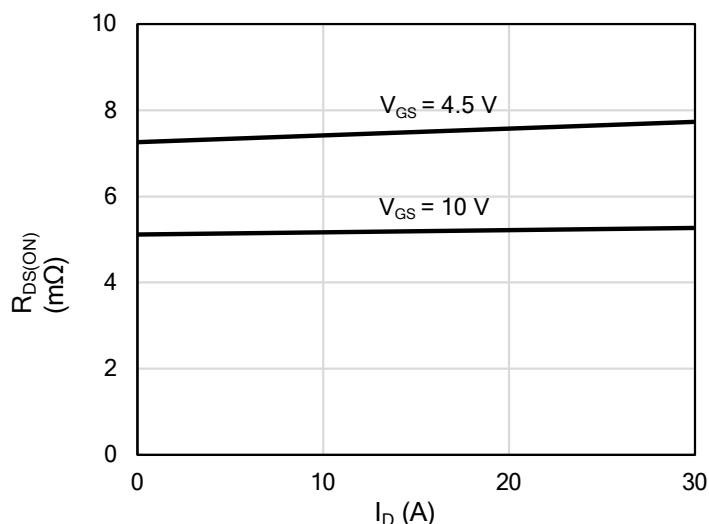


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

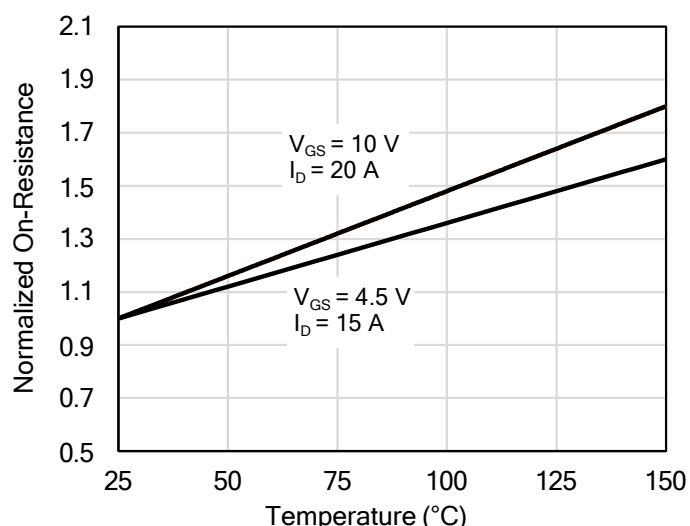


Figure 4: On-Resistance vs. Junction Temperature

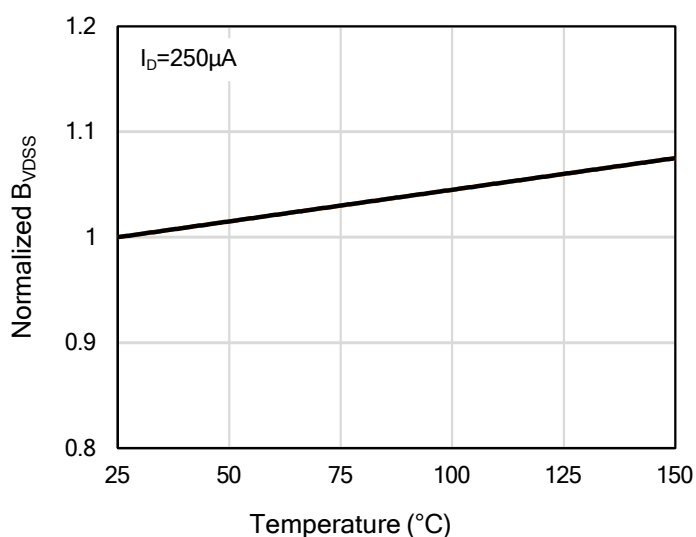


Figure 5: Breakdown Voltage vs. Junction Temperature

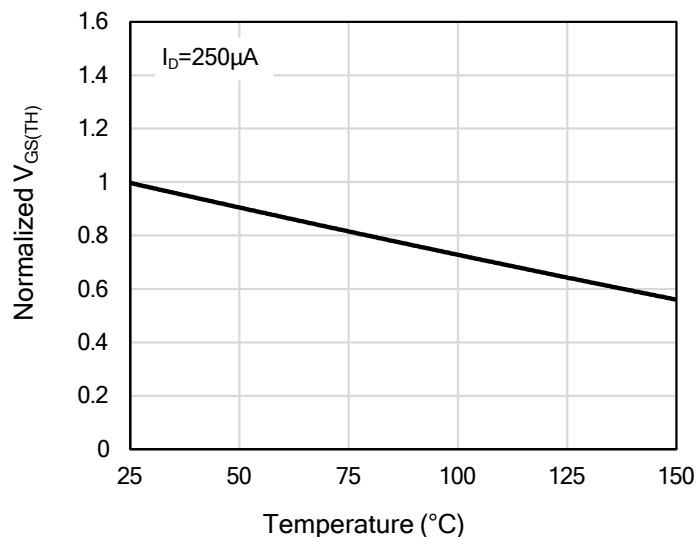


Figure 6: Threshold Voltage vs. Junction Temperature

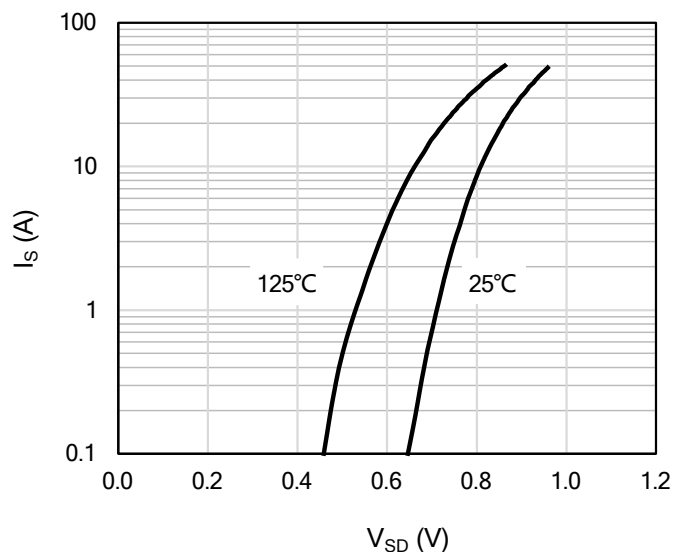


Figure 7: Body-Diode Characteristics

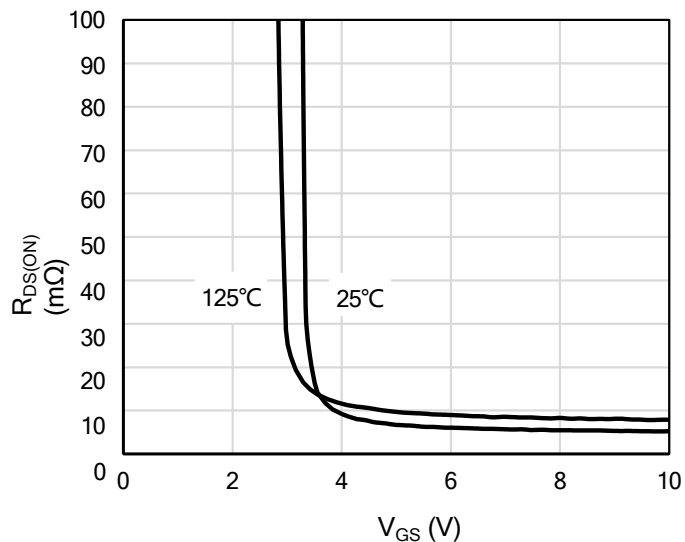


Figure 8: On-Resistance vs. Gate-Source Voltage

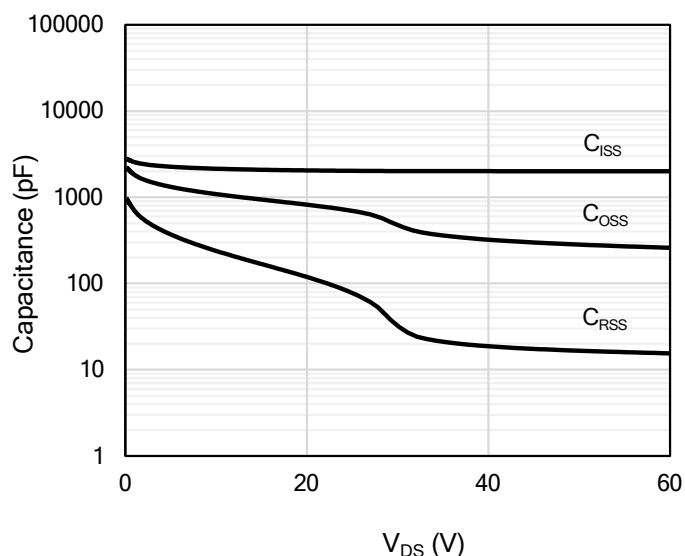


Figure 9: Capacitance Characteristics

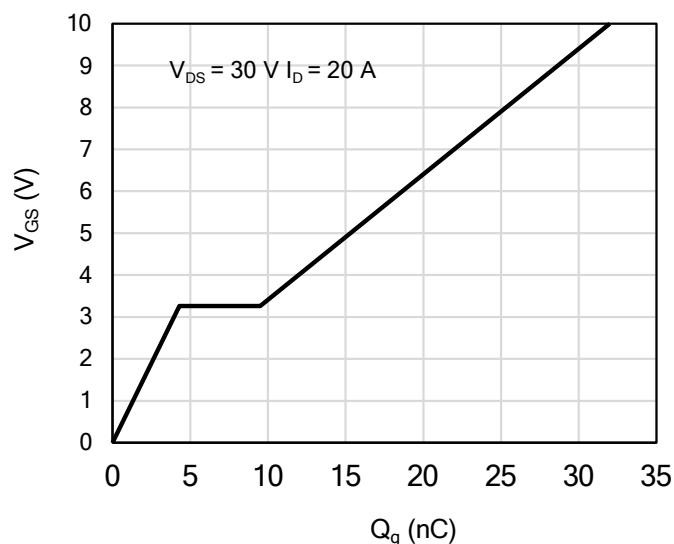


Figure 10: Gate-Charge Characteristics

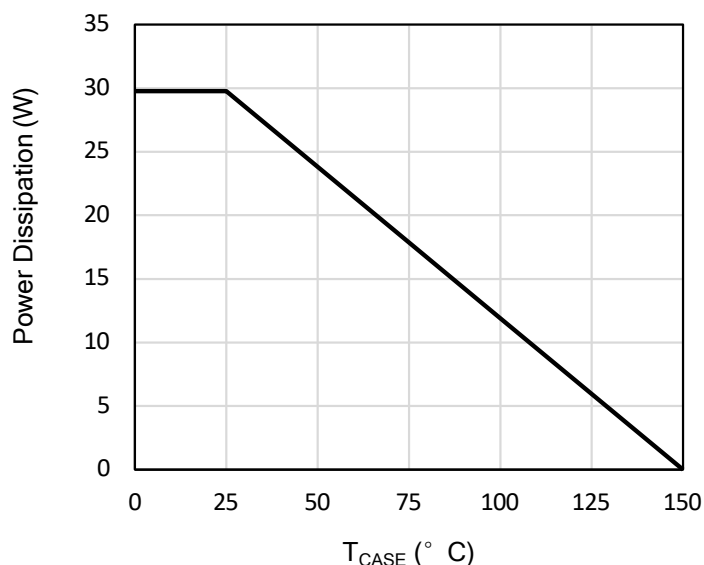


Figure 11: Power De-rating

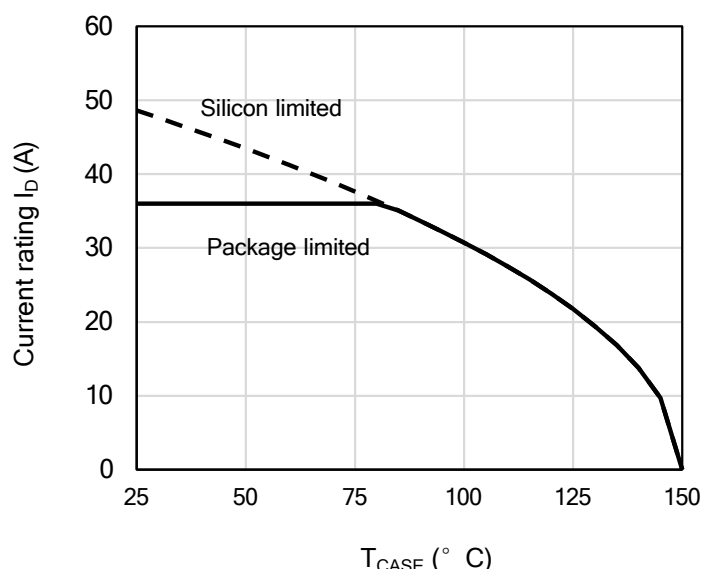


Figure 12: Current De-rating

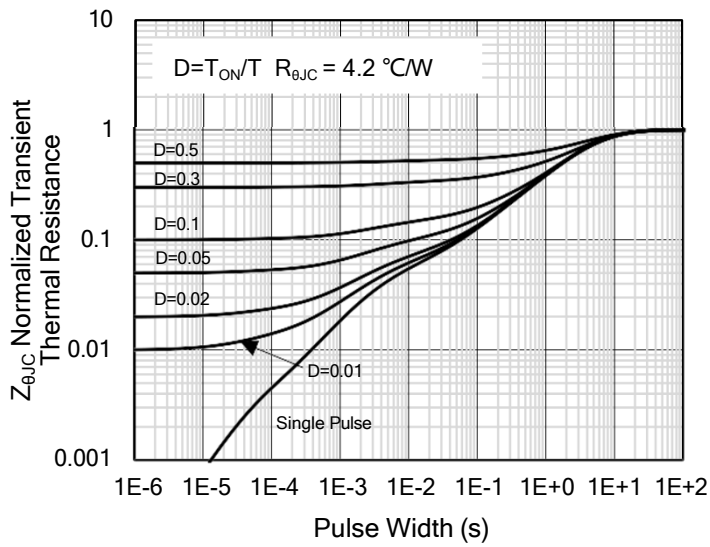


Figure 13: Normalized Maximum Transient Thermal Impedance

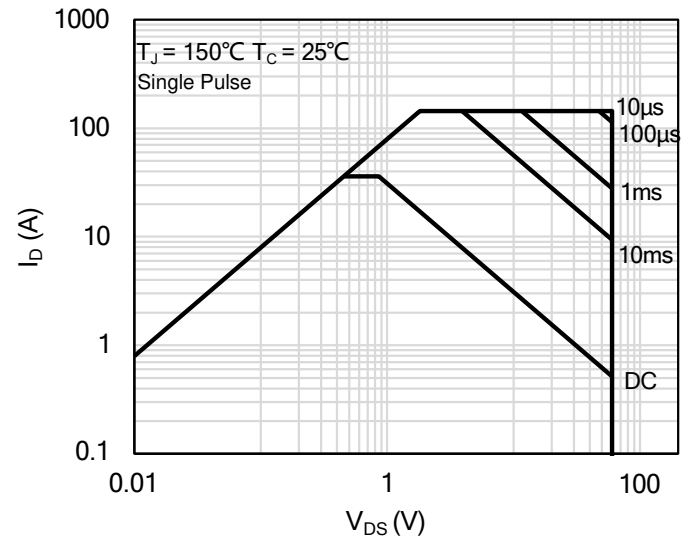
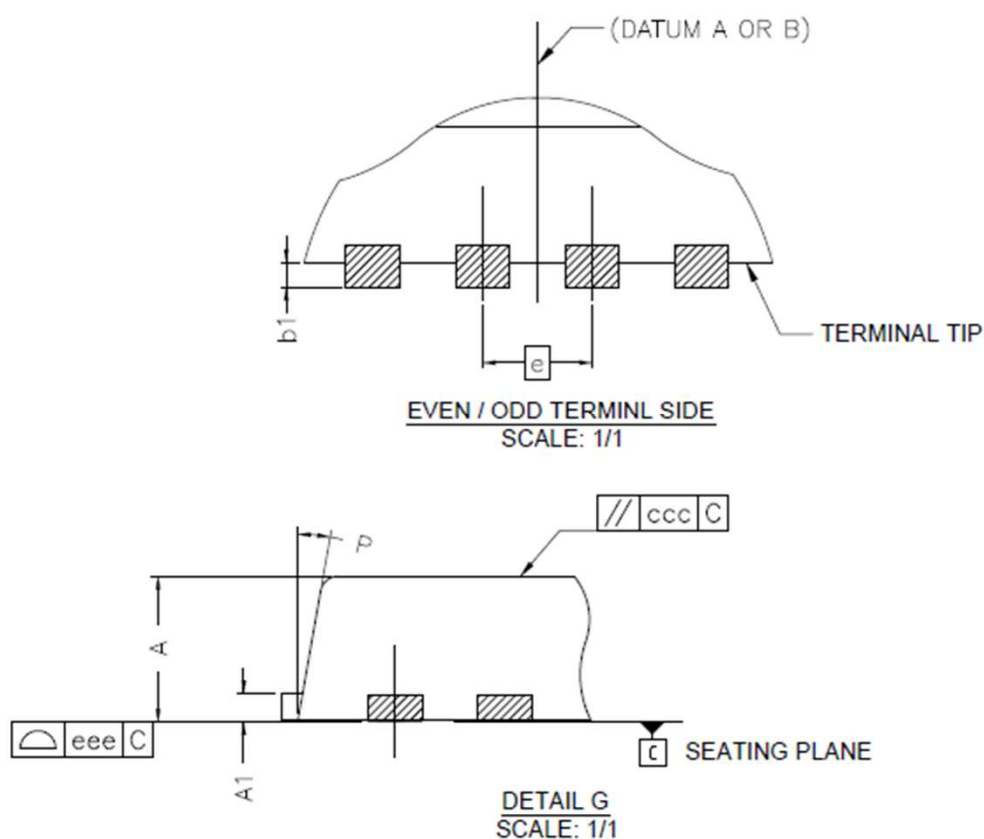


Figure 14: Maximum Forward Biased Safe Operating Area

Figure 1 is a mechanical drawing of a square pad with a central crosshair. The drawing includes a top view, a side view, and a detail view labeled "DETAIL G". The top view shows a square pad with a central crosshair and a grid of 8x8 points. Dimensions include 8Xb, 8X, and 8Xc. The side view shows the pad's profile with a central crosshair. The detail view shows a close-up of the pad's edge. The drawing is labeled "THIRD ANGLE PROJECTION".

Package Outline



SYMBOL	MIN	MAX	SYMBOL	MIN	MAX	NOTES
A	0.80	0.90	M	0.20		1.0 DIMENSIONING & TOLERANCEING CONFIRM TO ASME Y14.5M-1994. 2.0 ALL DIMENSIONS ARE IN MILLIMETERS. ANGLES ARE IN DEGREES. 3.0 DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.25mm AND 0.30mm FROM TERMINAL TIP. DIMENSION $L1$ REPRESENTS TERMINAL FULL BACK FROM PACKAGE EDGE UP TO 0.1mm IS ACCEPTABLE. 4.0 COPLANARITY APPLIES TO THE EXPOSED HEAT SLUG AS WELL AS THE TERMINAL. 5.0 RADIUS ON TERMINAL IS OPTIONAL. 6.0 LEAD WIDTH AND LF THICKNESS ARE INCLUDED WITH PLATING THICKNESS
A1	0.12	0.22	P	9°	11°	
b	0.22	0.42	z	0.58		
b1	0.05	0.15	aaa	0.10		
D	3.30 BSC		ccc	0.10		
D1	3.10 BSC		ddd	0.05		
D2	2.29	2.69	eee	0.05		
E	3.30 BSC					
E1	3.10 BSC					
E2	1.85	2.05				
e	0.65 BSC					
j	0.15	0.35				
k	0.75	0.95				
n	0.15	0.35				

Marking Information

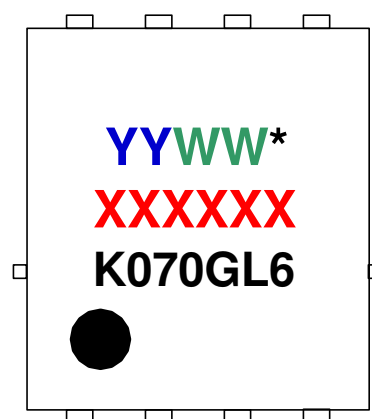
YY = Last two digits of the year

WW = Work week

***** = Site ID

XXXXXX = Lot ID

K070GL6 = K070GL6 is a designated device part number



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