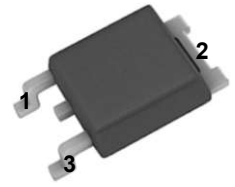
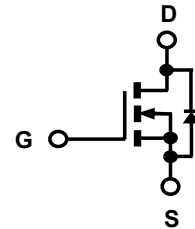


## ICEK15NF65D N-Channel Enhancement Mode MOSFET

### Features

- Low  $r_{DS(on)}$
- Ultra Low Gate Charge
- High  $dv/dt$  capability
- High Unclamped Inductive Switching (UIS) capability
- High peak current capability
- Increased transconductance performance
- Optimized design for high performance power systems

Product Summary			
$I_D$	$T_A=25^\circ\text{C}$	15.1A	Max
$V_{(BR)DSS}$	$I_D=250\mu\text{A}$	650V	Min
$r_{DS(on)}$	$V_{GS}=10\text{V}$	0.165	Typ
$Q_g$	$V_{DS}=400\text{V}$	32nC	Typ



T0252

Standard Metal  
Heatsink

1=Gate, 2=Drain,  
3=Source.



**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>	$I_D$	$T_c=25^\circ\text{C}$	15.1	A
		$T_c=100^\circ\text{C}$	9.5	
Pulsed drain current <sup>b</sup>	$I_{D, pulse}$	$T_c=25^\circ\text{C}$	60	A
Avalanche energy, single pulse	$E_{AS}$	$L=75\text{mH}$ , $V_{DD}=100\text{V}$ , $I_D=1.8\text{A}$ , $R_G=25\Omega$	121.5	mJ
Avalanche current, repetitive <sup>b</sup>	$I_{AR}$	limited by $T_j\text{max}$	1.8	A
MOSFET $dv/dt$ ruggedness	$dv/dt$	$V_{DS}=480\text{V}$	50	V/ns
Reverse diode $dv/dt$ ruggedness			100	
Gate source voltage	$V_{GS}$	Static	$\pm 30$	V
		AC ( $f>1\text{Hz}$ )		
Power dissipation	$P_{tot}$	$T_c=25^\circ\text{C}$	113.6	W
Operating and storage temperature	$T_j, T_{stg}$		-55 to +150	$^\circ\text{C}$

<sup>a</sup> Preliminary data sheet - Specifications subject to change.

<sup>b</sup> limited by  $T_{j\text{max}}$

<sup>c</sup> 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	$R_{thJC}$		-	-	1.1	°C/W
Thermal resistance, junction-ambient °	$R_{thJA}$	leaded	-	-	60	
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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	3.5	4.5	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V$	-	-	10	$\mu A$
Gate source leakage current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	0.165	0.19	$\Omega$
Gate resistance	$R_G$	$f=1\text{ MHz}$ , open drain	-	17	-	$\Omega$

#### Dynamic characteristics

Input capacitance	$C_{iss}$	$V_{DS}=400V, V_{GS}=0V, f=1\text{ MHz}$	-	910	-	pF
Output capacitance	$C_{oss}$		-	24	-	
Reverse transfer capacitance	$C_{rss}$		-	6.5	-	
Turn-on delay time	$t_{d(on)}$	$V_{DS}=400V, V_{GS}=10V, I_D=10A, R_G=2\Omega$ (External)	-	43	-	ns
Rise time	$t_r$		-	38	-	
Turn-off delay time	$t_{d(off)}$		-	72	-	
Fall time	$t_f$		-	9	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

### Gate charge characteristics

Gate to source charge	$Q_{gs}$	$V_{DS}=400V, I_D=10A,$ $V_{GS}=0 \text{ to } 10V$	-	5	-	nC
Gate to drain charge	$Q_{gd}$		-	17	-	
Gate charge total	$Q_g$		-	32	-	

### Reverse Diode

Continuous forward current	$I_S$	$V_{GS}=0V$	-	-	15.1	A
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=I_F$	-	1.25	-	V
Reverse recovery time	$t_{rr}$	$V_{RR}=400V, I_S=10A,$ $d_{iF}/d_t=200 \text{ A}/\mu\text{S}$	-	66	-	ns
Reverse recovery charge	$Q_{rr}$		-	0.6	-	$\mu\text{C}$
Peak reverse recovery current	$I_{rm}$		-	12	-	A

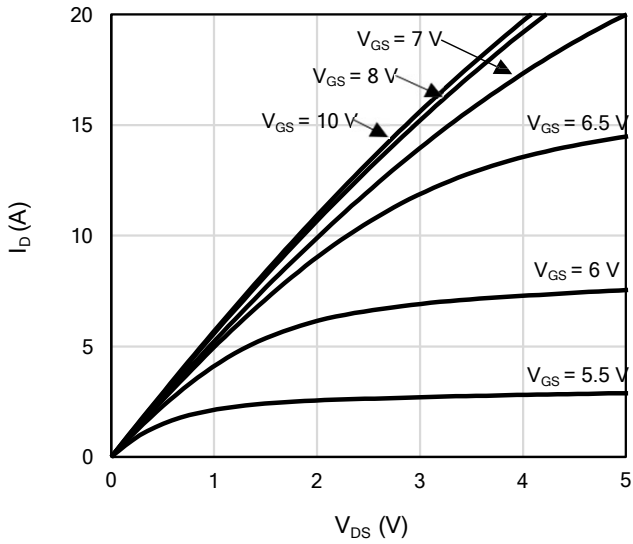


Figure 1: On-Region Characteristics

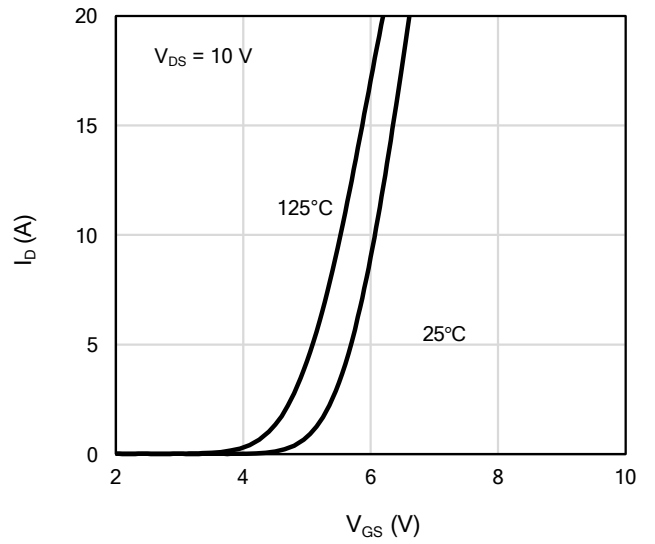


Figure 2: Transfer Characteristics

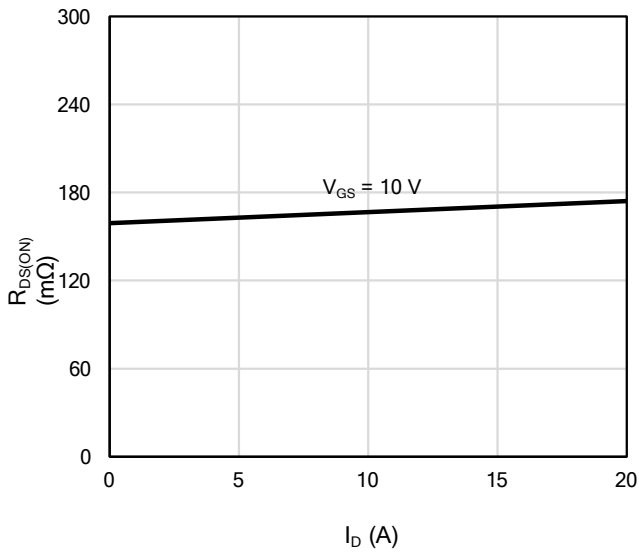


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

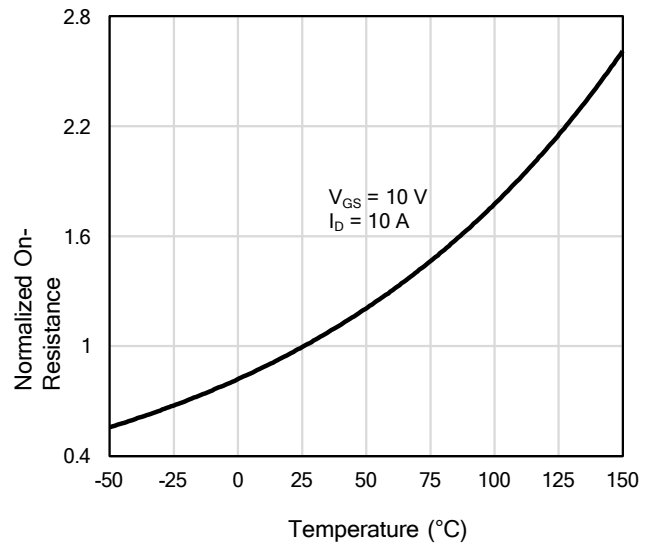


Figure 4: On-Resistance vs. Junction Temperature

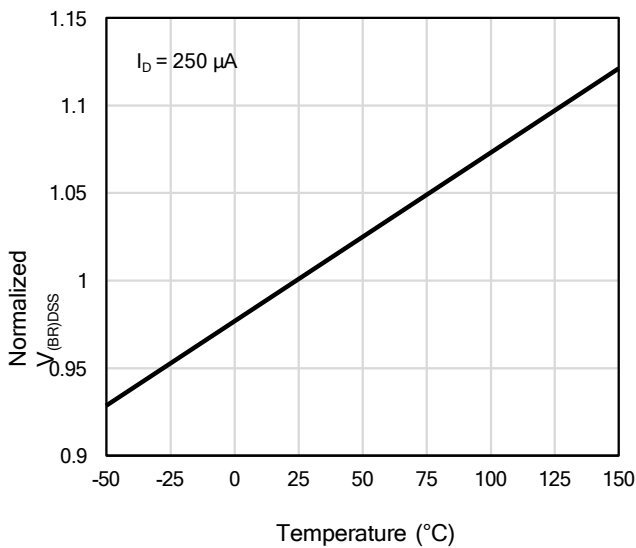


Figure 5: Breakdown Voltage vs. Junction Temperature

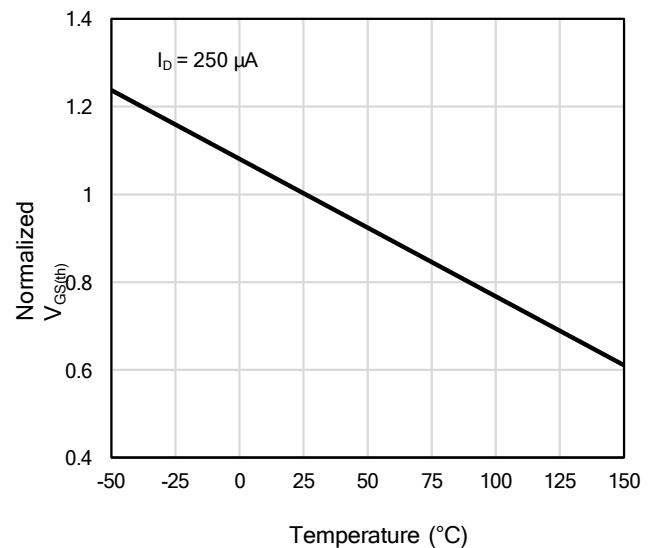


Figure 6: Threshold Voltage vs. Junction Temperature

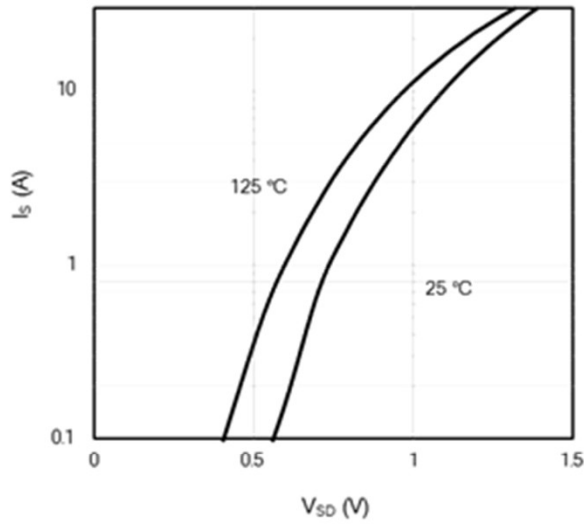


Figure 7: Body-Diode Characteristics

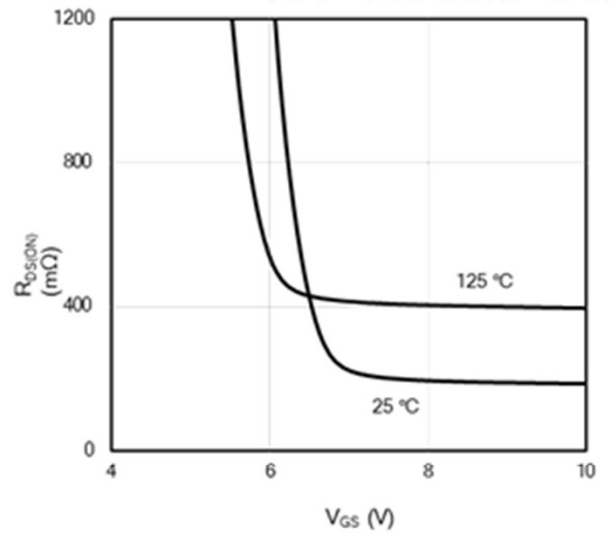


Figure 8: On-Resistance vs. Gate-Source Voltage

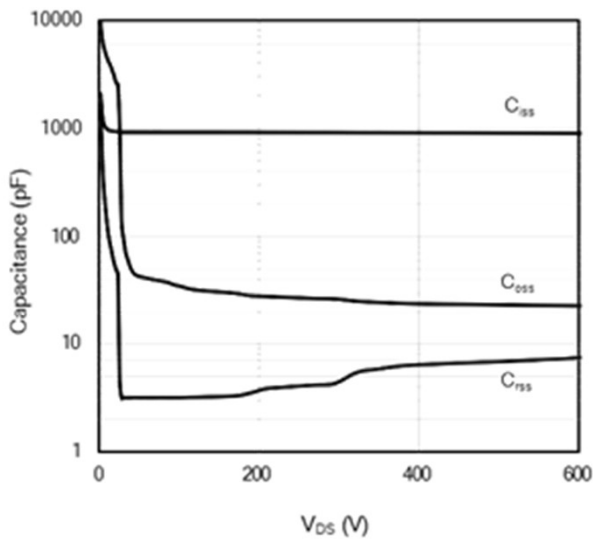


Figure 9: Capacitance Characteristics

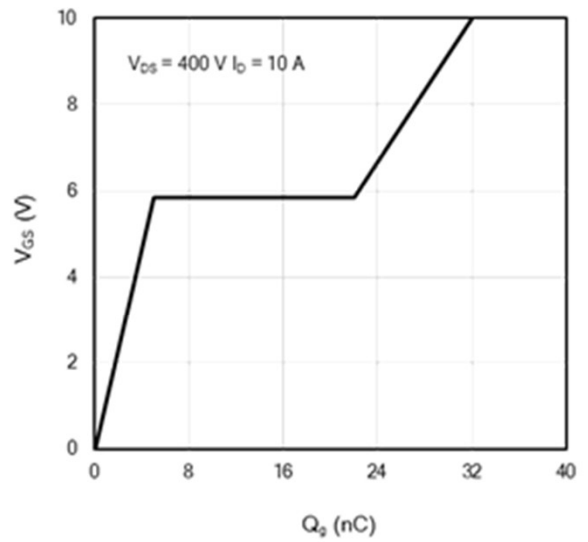


Figure 10: Gate-Charge Characteristics

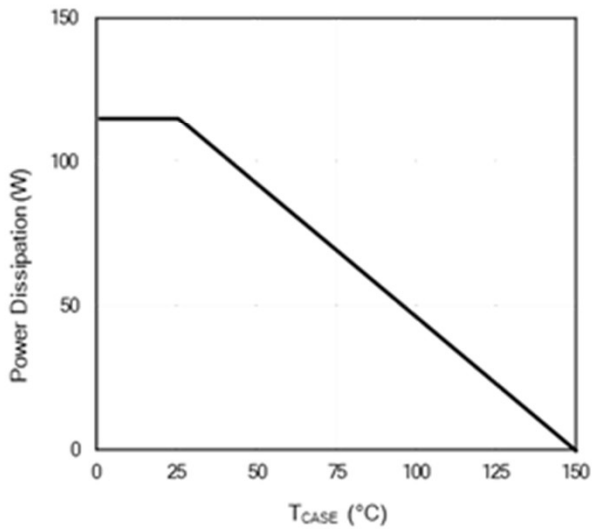


Figure 11: Power De-rating

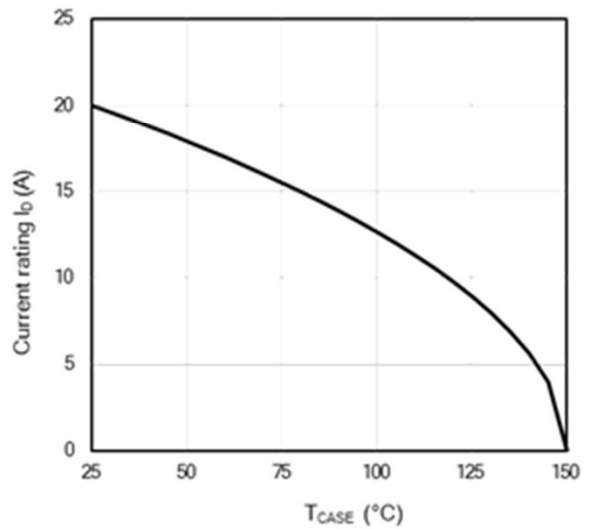


Figure 12: Current De-rating

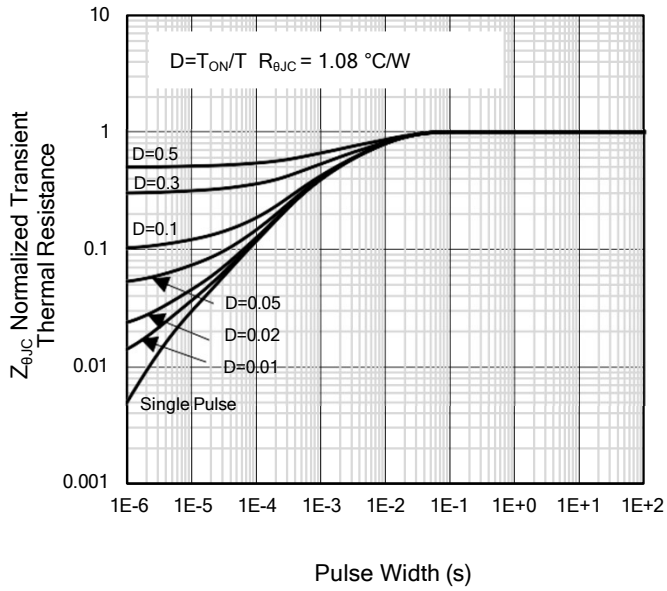


Figure 13: Normalized Maximum Transient Thermal Impedance

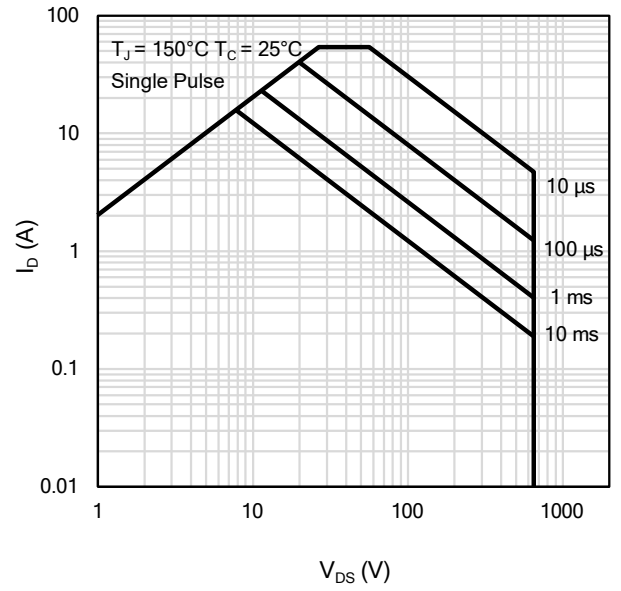


Figure 14: Maximum Forward Biased Safe Operating Area

## Marking Information

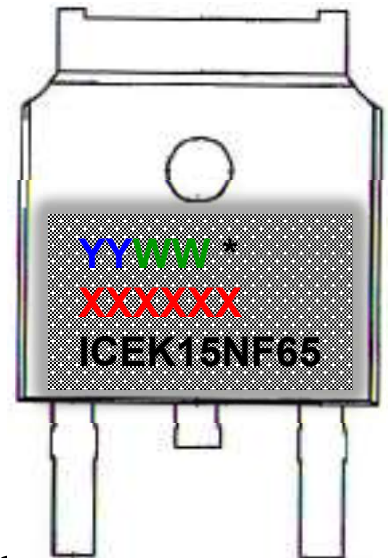
**YY** = Last two digits of the year

**WW** = Work week

**\*** = Site ID

**XXXXXX** = Lot ID

**ICEK15NF65** = ICE is IceMOS logo and  
K15NF65 is a designated device part  
number



## Disclaimer

Information contained in this data sheet shall in no event be regarded as a guarantee of conditions or characteristics. All product, data sheet are subject to change without notice to improve reliability. ICEMOS technology will not be responsible for damages of any nature resulting from the use or reliance upon the information contained in this data sheet.