

ICE10N65FP

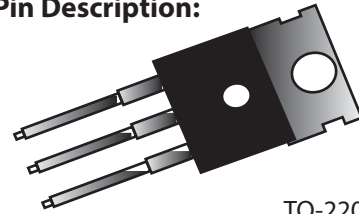
N-Channel Enhancement Mode MOSFET

Features:

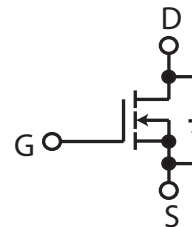
- Low $r_{DS(on)}$
- Ultra Low Gate Charge
- High dv/dt Capability
- High Unclamped Inductive Switching (UIS) Capability
- High Peak Current Capability
- Increased Transconductance Performance
- Optimized Design For High Performance Power Systems

Product Summary			
I_D	$T_A = 25^\circ\text{C}$	9.5A	Max
$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$	650V	Min
$r_{DS(ON)}$	$V_{GS} = 10\text{V}$	0.35 Ω	Typ
Q_g	$V_{DS} = 480\text{V}$	41nC	Typ

Pin Description:



TO-220



Maximum Ratings @ $T_j = 25^\circ\text{C}$, Unless Otherwise Specified

Symbol	Parameter	Value	Unit	Conditions
I_D	Continuous Drain Current	9.5	A	$T_C = 25^\circ\text{C}$
$I_{D, \text{pulse}}$	Pulsed Drain Current	28.5	A	$T_C = 25^\circ\text{C}$
E_{AS}	Avalanche Energy, Single Pulse	340	mJ	$I_D = 8.3\text{A}$
I_{AR}	Avalanche Current, Repetitive	5	A	Limited by $T_{j,max}$
dv/dt	MOSFET dv/dt Ruggedness	50	V/ns	$V_{DS} = 480\text{V}, I_D = 9.5\text{A}, T_j = 125^\circ\text{C}$
V_{GS}	Gate Source Voltage	± 20	V	Static
		± 30		AC (f>Hz)
P_{tot}	Power Dissipation	35	W	$T_C = 25^\circ\text{C}$
T_j, T_{stg}	Operating and Storage Temperature	-55 to +150	$^\circ\text{C}$	
	Mounting Torque	50	Ncm	M 2.5 screws

Symbol	Parameter	Values			Unit	Conditions
		Min	Typ	Max		

Thermal Characteristics

R_{thJC}	Thermal Resistance, Junction to Case	-	-	3.5	$^\circ\text{C}/\text{W}$	
R_{thJA}	Thermal Resistance, Junction to Ambient	-	-	80		Leaded
T_{sold}	Soldering Temperature, Wave Soldering Only Allowed At Leads	-	-	260	$^\circ\text{C}$	1.6mm (0.063in.) from Case for 10s

Electrical Characteristics @ $T_j = 25^\circ\text{C}$, Unless Otherwise Specified

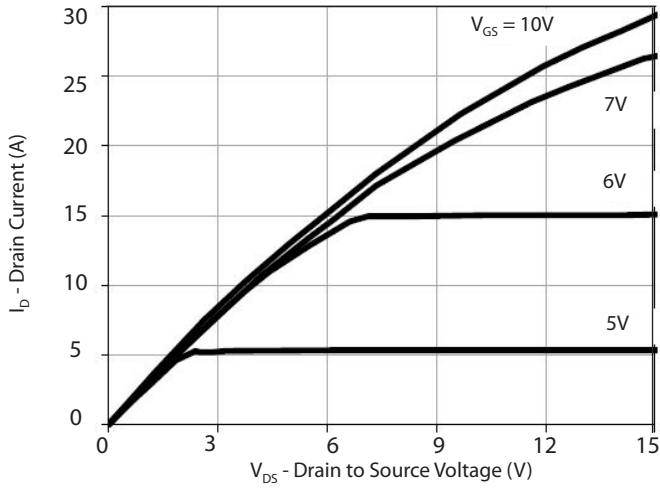
Static Characteristics						
$V_{(BR)DSS}$	Drain to Source Breakdown Voltage	650	675	-	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
$V_{GS(th)}$	Gate Threshold Voltage	2.1	3	3.9		$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
I_{DSS}	Zero Gate Voltage Drain Current	-	0.1	1	μA	$V_{DS} = 650\text{V}, V_{GS} = 0\text{V}, T_j = 25^\circ\text{C}$
		-	-	100		$V_{DS} = 650\text{V}, V_{GS} = 0\text{V}, T_j = 150^\circ\text{C}$
I_{GSS}	Gate Source Leakage Current	-	-	100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
$R_{DS(on)}$	Drain to Source On-State Resistance	-	0.35	0.38	Ω	$V_{GS} = 10\text{V}, I_D = 4.75\text{A}, T_j = 25^\circ\text{C}$
		-	0.63	-		$V_{GS} = 10\text{V}, I_D = 4.75\text{A}, T_j = 150^\circ\text{C}$
R_{GS}	Gate Resistance	-	5	-	Ω	f = 1 MHz, open drain

ICE10N65FP

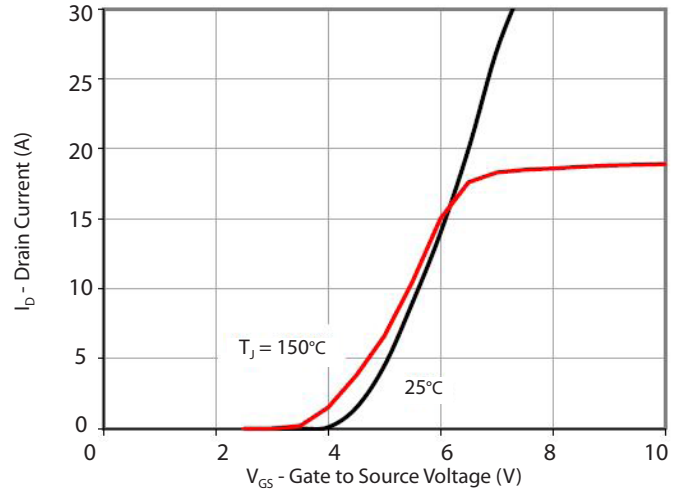
Symbol	Parameter	Values			Unit	Conditions
		Min	Typ	Max		
Dynamic Characteristics						
C_{iss}	Input Capacitance	-	1250	-	pF	$V_{GS} = 0V, V_{DS} = 25V, f = 1\text{ MHz}$
C_{oss}	Output Capacitance	-	600	-		
C_{rss}	Reverse Transfer Capacitance	-	5	-		
g_{fs}	Transconductance	-	12	-	S	$V_{DS} > 2 \cdot I_D \cdot R_{DS}, I_D = 7.5A$
$t_{d(on)}$	Turn-on Delay Time	-	6	-	nS	$V_{DS} = 380V, V_{GS} = 10V, I_D = 9.5A, R_G = 4\Omega$ (External)
T_r	Rise Time	-	3.5	-		
$t_{d(off)}$	Turn-off Delay Time	-	54	-		
t_f	Fall Time	-	7	-		
Gate Charge Characteristics						
Q_{gs}	Gate to Source Charge	-	7.1	-	nC	$V_{DS} = 480V, I_D = 9.5A, V_{GS} = 0\text{ to }10V$
Q_{gd}	Gate to Drain Charge	-	14.5	-		
Q_g	Gate Charge Total	-	41	-		
$V_{plateau}$	Gate Plateau Voltage	-	5.2	-	V	
Reverse Diode						
V_{SD}	Diode Forward Voltage	-	0.9	1.2	V	$V_{GS} = 0V, I_S = I_F$
t_{rr}	Reverse Recovery Time	-	332	-	ns	$V_{RR} = 480V, I_S = I_F, d_{IF}/d_t = 100\text{ A}/\mu\text{S}$
Q_{rr}	Reverse Recovery Charge	-	4.4	-	μC	
I_{rm}	Peak Reverse Recovery Current	-	25.6	-	A	

ICE10N65FP

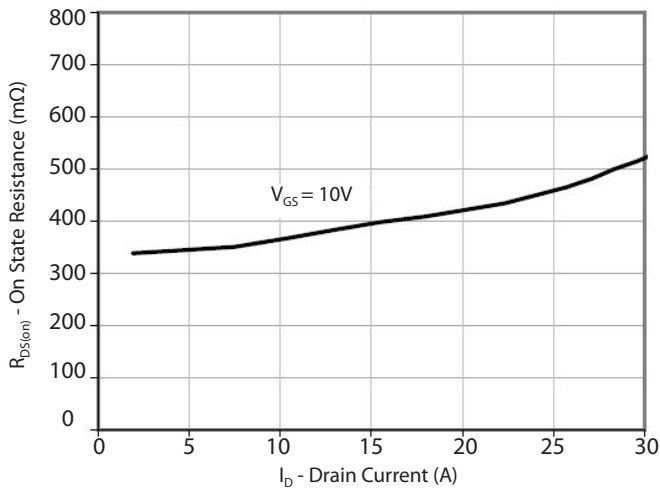
Output Characteristics



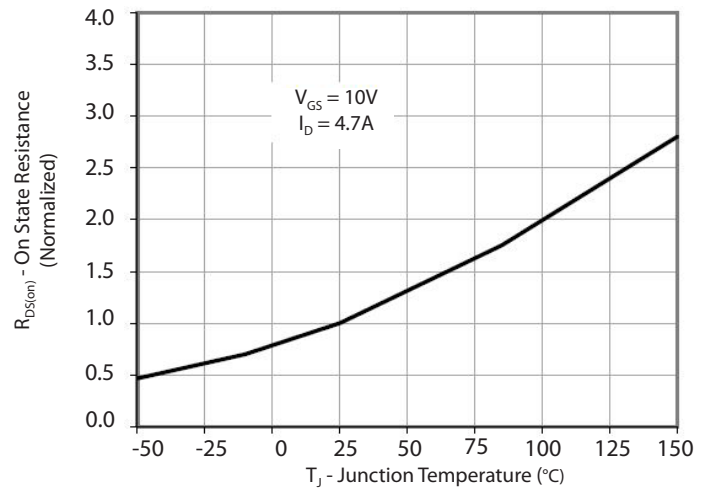
Transfer Characteristics



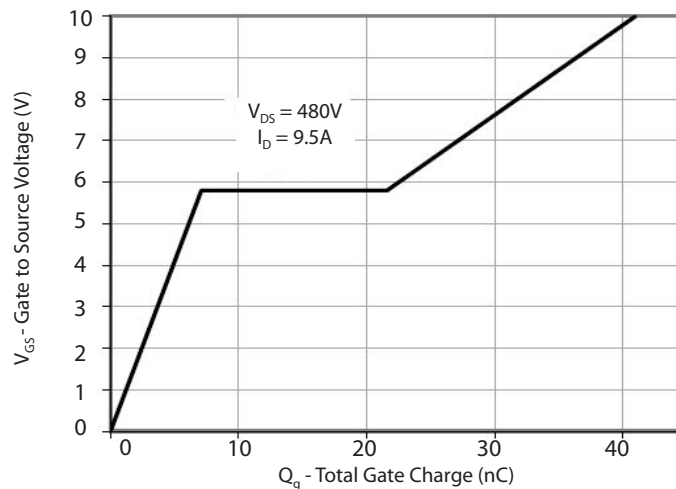
On State Resistance vs Drain Current



On Resistance vs Junction Temperature

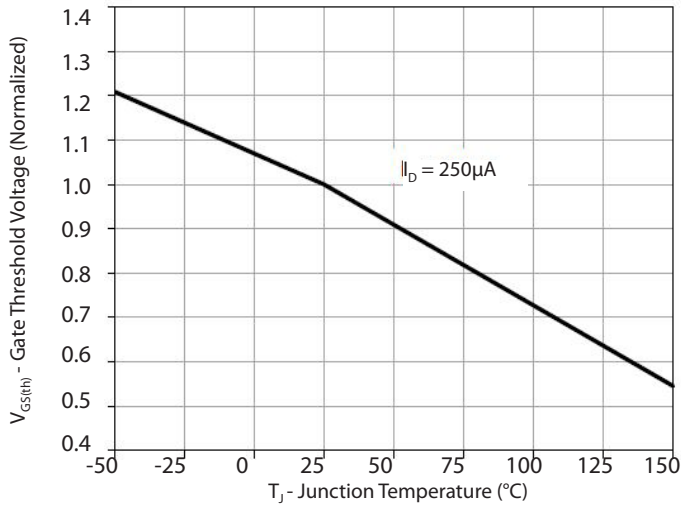


Gate Charge

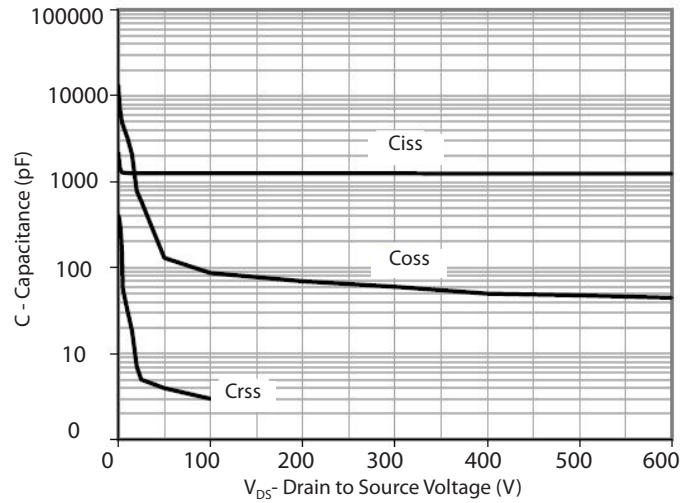


ICE10N65FP

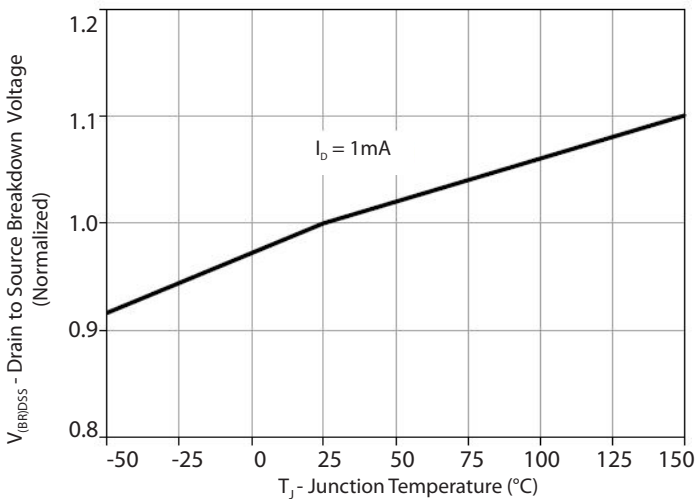
Gate Threshold Voltage vs. Junction Temperature



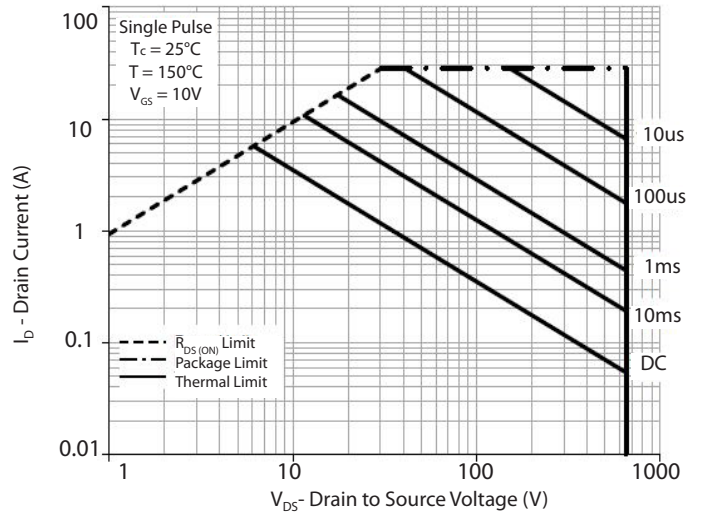
Capacitance



Drain to Source Breakdown Voltage vs. Junction Temperature



Maximum Rate Forward Biased Safe Operating Area



Transient Thermal Response - Junction to Case

