Figure 1. Bare Die Dimensions

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Parameter			Symbol	Value	Unit
Drain−to−Source Voltage			V_{DSS}	1200	V
Gate−to−Source Voltage			V_{GS}	−15/+25	V
Recommended Operation Values of Gate−to−Source Voltage	T_C < 175°C		V_{GSop}	−5/+20	V
Continuous Drain Current $R_{\theta JC}$	Steady State	T_C = 25°C	I_D	31	A
Power Dissipation $R_{\theta JC}$			P_D	178	W
Continuous Drain Current $R_{\theta JC}$	Steady State	T_C = 100°C	I_D	22	A
Power Dissipation $R_{\theta JC}$			P_D	89	W
Pulsed Drain Current (Note 2)	T_C = 25°C		I_{DM}	132	A
Single Pulse Surge Drain Current Capability	T_C = 25°C, t_p = 10 μs, R_G = 4.7 Ω		I_{DSC}	132	A
Operating Junction and Storage Temperature Range			T_J, T_{stg}	−55 to +175	°C

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 1 mA	1200	–	–	V
Drain−to−Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	I_D = 1 mA, referenced to 25°C	–	700	–	mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = 1200 V, T_J = 25°C	–	–	100	μA
		V_{GS} = 0 V, V_{DS} = 1200 V, T_J = 175°C	–	–	250	μA
Gate−to−Source Leakage Current	I_{GSS}	V_{GS} = +25/−15 V, V_{DS} = 0 V	–	–	±1	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 5 mA	1.8	2.7	4.3	V
Recommended Gate Voltage	V_{GOP}		−5	–	+20	V
Drain−to−Source On Resistance	$R_{DS(on)}$	V_{GS} = 20 V, I_D = 20 A, T_J = 25°C	–	80	110	mΩ
		V_{GS} = 20 V, I_D = 20 A, T_J = 150°C	–	114	–	
Forward Transconductance	g_{FS}	V_{DS} = 20 V, I_D = 20 A	–	13	–	S
CHARGES, CAPACITANCES & GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = 800 V	–	1112	–	pF
Output Capacitance	C_{OSS}		–	80	–	
Reverse Transfer Capacitance	C_{RSS}		–	6.5	–	
Total Gate Charge	$Q_{G(tot)}$	V_{GS} = −5/20 V, V_{DS} = 600 V, I_D = 20 A	–	56	–	nC
Gate−to−Source Charge	Q_{GS}		–	11	–	
Gate−to−Drain Charge	Q_{GD}		–	12	–	
Gate Resistance	R_G	f = 1 MHz	–	1.7	–	Ω
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = −5/20 V, V_{DS} = 800 V, I_D = 20 A, R_G = 4.7 Ω, Inductive Load	–	13	–	ns
Rise Time	t_r		–	20	–	
Turn−Off Delay Time	$t_{d(off)}$		–	22	–	
Fall Time	t_f		–	10	–	
Turn-On Switching Loss	E_{ON}		–	258	–	μJ
Turn-Off Switching Loss	E_{OFF}		–	52	–	
Total Switching Loss	E_{TOT}		–	311	–	
DRAIN−SOURCE DIODE CHARACTERISTICS						
Continuous Drain−to−Source Diode Forward Current	I_{SD}	V_{GS} = −5 V	–	–	18	A
Pulsed Drain−to−Source Diode Forward Current (Note 2)	I_{SDM}	V_{GS} = −5 V	–	–	132	A
Forward Diode Voltage	V_{SD}	V_{GS} = −5 V, I_{SD} = 10 A	–	4	–	V
Reverse Recovery Time	t_{RR}	V_{GS} = −5/20 V, I_{SD} = 20 A, dI_S/dt = 1000 A/μs	–	16	–	ns
Reverse Recovery Charge	Q_{RR}		–	62	–	nC
Reverse Recovery Energy	E_{REC}		–	5	–	μJ
Peak Reverse Recovery Current	I_{RRM}		–	8	–	A

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

NTC080N120SC1

TYPICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted) (continued)

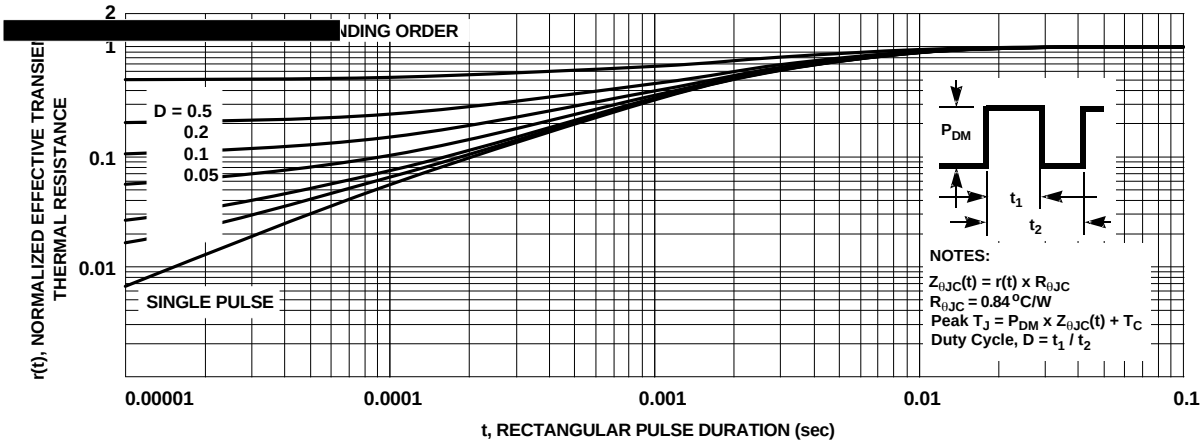

Figure 14. Junction−to−Case Transient Thermal Response Curve