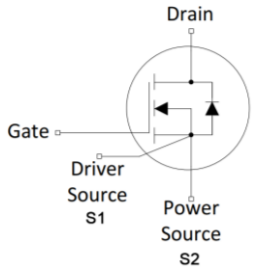
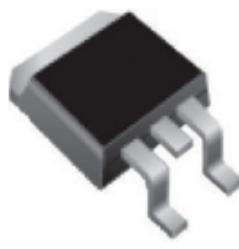


N-Channel Super-junction Power MOSFET

<p>Description</p> <p>The GC11N65M uses advanced super junction technology and design to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for industry's AC-DC SMPS requirement for PFC, AC/DC power conversion, and industrial power application.</p> <p>General Features</p> <ul style="list-style-type: none"> ● V_{DS} 650V ● I_D (at $V_{GS} = 10V$) 11A ● $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 360mΩ ● 100% Avalanche Tested ● RoHS Compliant <p>Application</p> <ul style="list-style-type: none"> ● Power switch ● DC/DC converters 		 <p>Schematic Diagram</p>  <p>TO-263</p>	
Device	Package	Marking	Packaging
GC11N65M	TO-263	GC11N65	50pcs/Tube

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	650	V
Continuous Drain Current	I_D	11	A
Pulsed Drain Current (note1)	I_{DM}	33	A
Gate-Source Voltage	V_{GS}	±30	V
Single Pulse Avalanche Energy (note2)	E_{AS}	3.1	mJ
Power Dissipation ($T_C = 25^\circ C$)	P_D	78	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	°C

Thermal Resistance			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	1.6	°C/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62	

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	650	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	μA
		$V_{DS} = 650V, V_{GS} = 0V, T_J = 150^\circ\text{C}$	--	--	100	
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 30V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	3.5	4.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5.5A$	--	340	360	m Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 50V,$ $f = 1.0\text{MHz}$	--	768	--	μF
Output Capacitance	C_{oss}		--	19	--	
Reverse Transfer Capacitance	C_{rss}		--	0.4	--	
Total Gate Charge	Q_g	$V_{DD} = 520V, I_D = 11A,$ $V_{GS} = 10V$	--	21	--	nC
Gate-Source Charge	Q_{gs}		--	4.5	--	
Gate-Drain Charge	Q_{gd}		--	7	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 400V, I_D = 11A,$ $R_G = 25\Omega$	--	42	--	ns
Turn-on Rise Time	t_r		--	20	--	
Turn-off Delay Time	$t_{d(off)}$		--	122	--	
Turn-off Fall Time	t_f		--	6	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	11	A
Pulsed Diode Forward Current	I_{SM}		--	--	33	
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = 11A, V_{GS} = 0V$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$V_R = 520V, I_F = 11A,$ $di_F/dt = 100A/\mu s$	--	280	--	ns
Reverse Recovery Charge	Q_{rr}		--	3	--	μC
Peak Reverse Recovery Current	I_{rrm}		--	17	--	A

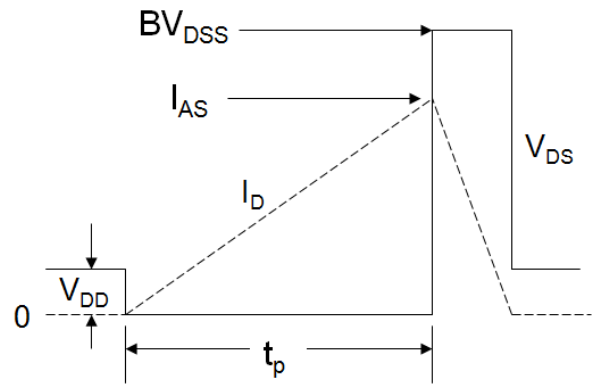
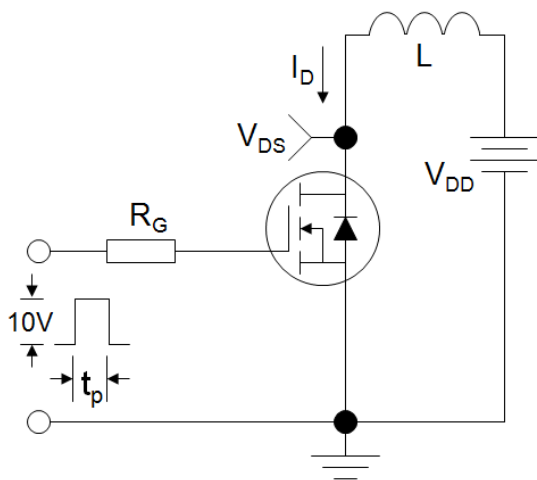
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS} = 3A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

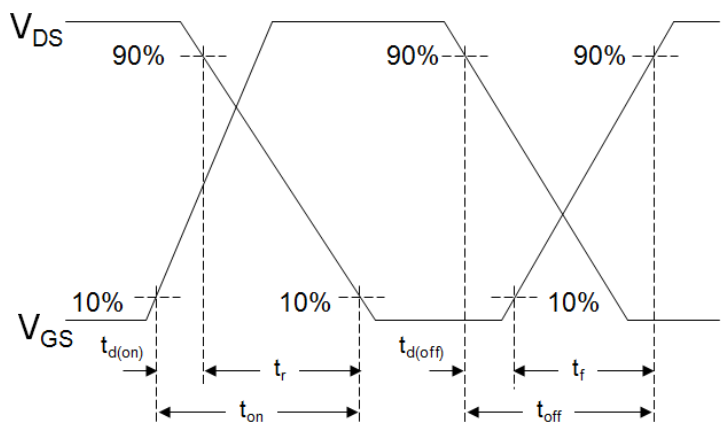
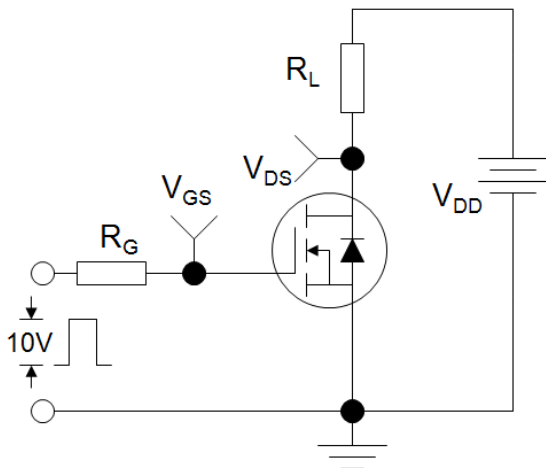
Gate Charge Test Circuit



EAS Test Circuit



Switch Time Test Circuit



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

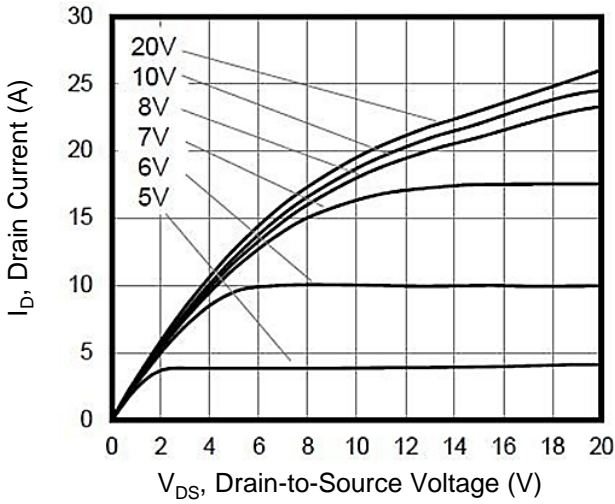


Figure 2. Transfer Characteristics

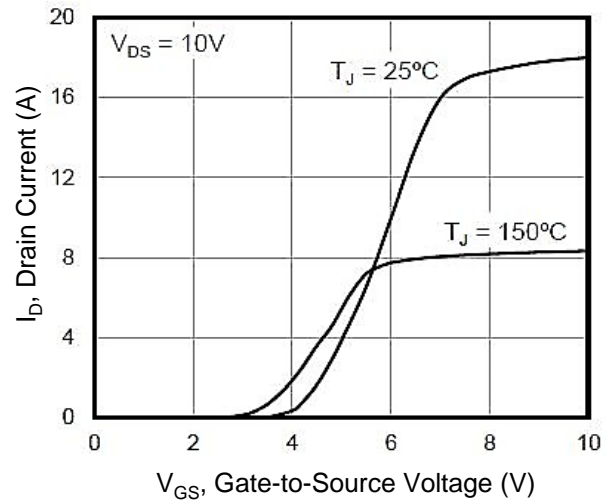


Figure 3. Drain Source On Resistance

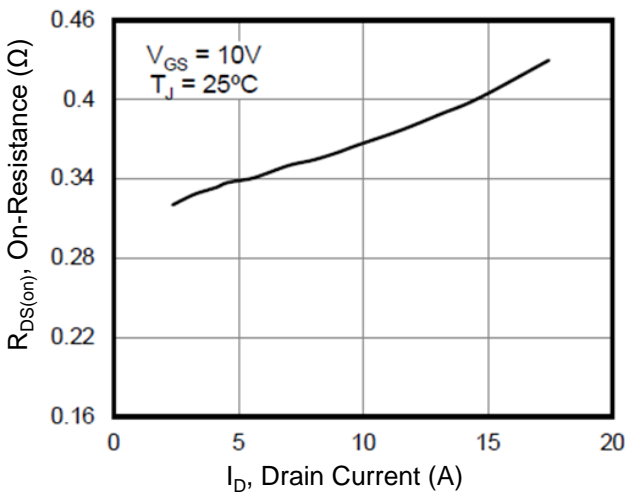


Figure 4. Capacitance

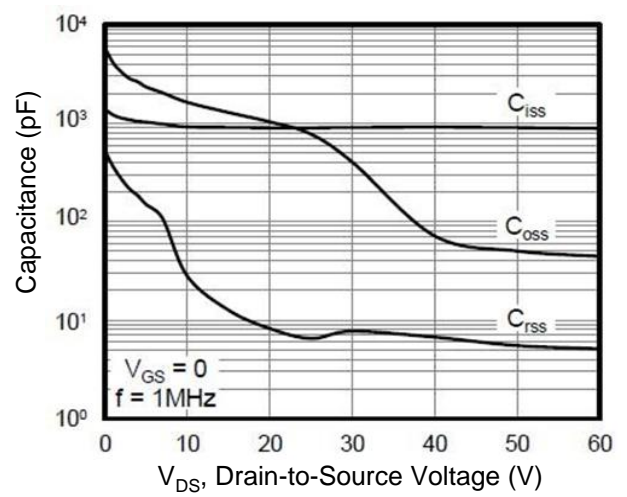


Figure 5. Gate Charge

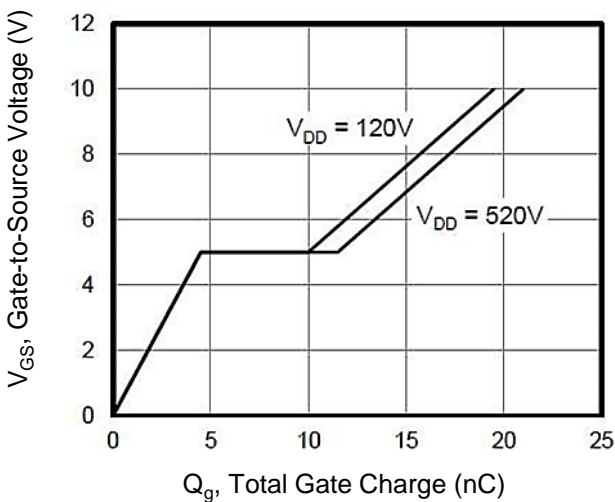
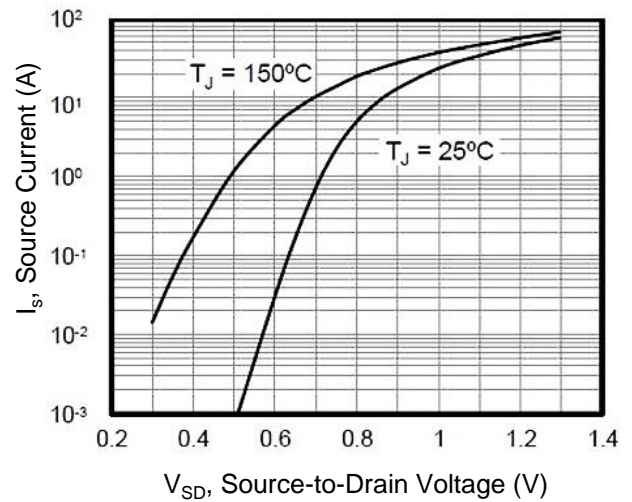


Figure 6. Source-Drain Diode Forward



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Drain-Source On-Resistance

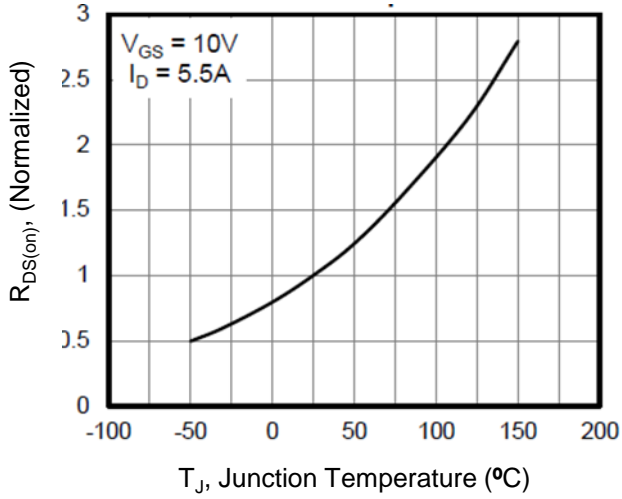


Figure 8. V_{th} VS T_J

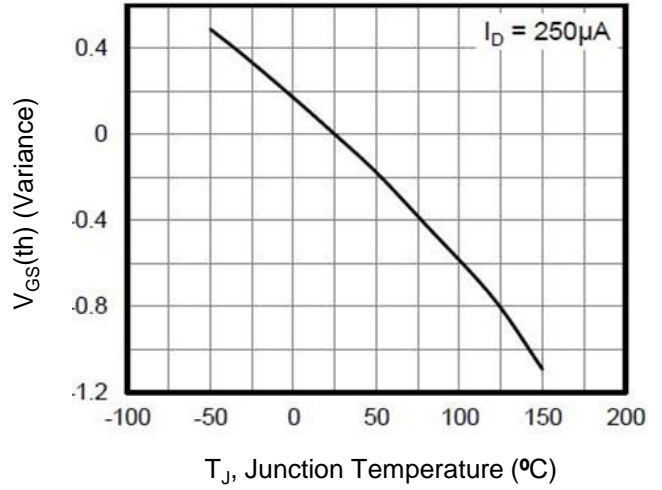
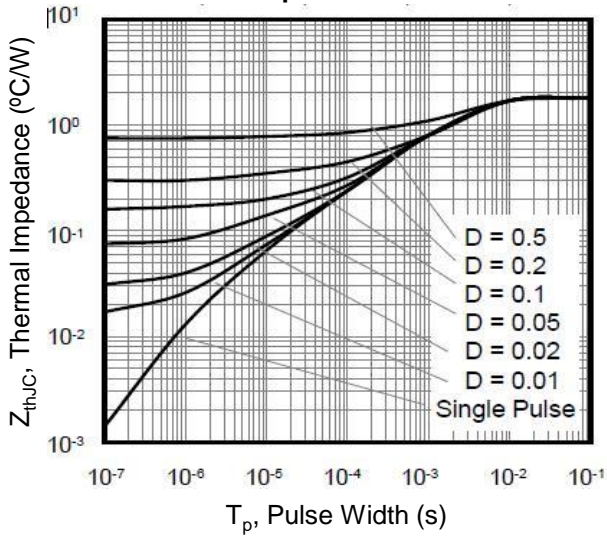
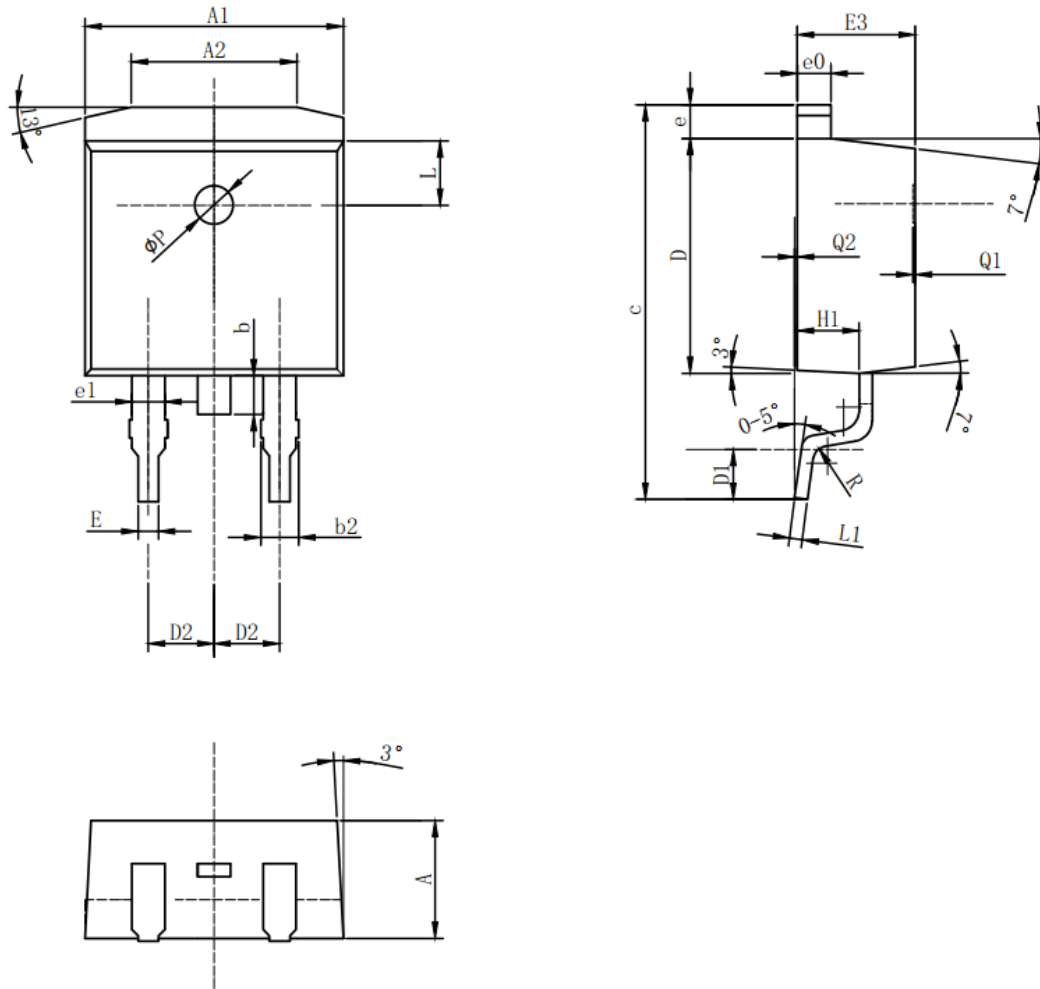


Figure 9. Transient Thermal Impedance



TO-263 Package Information



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.52	4.57	4.62
A1	9.95	10.00	10.05
A2	6.30	6.40	6.50
b	1.30	1.50	1.70
b2	1.17	1.27	1.37
c	14.80	15.00	15.20
D	9.05	9.10	9.15
D1	1.90	2.10	2.30
D2	-	2.54	-
E	-	0.80	-
E3	-	4.57	-
e	-	1.30	-
e0	-	1.30	-
e1	1.73	3	-
H1	-	2.40	-
L	-	2.50	-
L1	-	0.50	-
ϕP	-	1.50	-
R	-	0.50	-
Q1	0.10	-	0.15
Q2	0	-	0.02

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