



650V SuperJunction Power MOSFET

Features

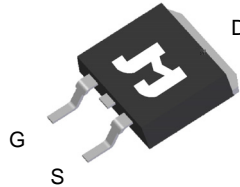
- Extremely Low Gate Charge
- Excellent Output Capacitance (C_{oss}) Profile
- Fast Switching Capability
- 100% UIS Tested, 100% R_g Tested
- Pb-free Lead Plating
- Halogen-free

Product Summary

Parameter	Value	Unit
V_{DS}	650	V
$V_{GS(th)}_{Typ}$	3.5	V
I_D (@ $V_{GS} = 10V$) ⁽¹⁾	35.0	A
$R_{DS(ON)}_{Typ}$ (@ $V_{GS} = 10V$)	98	m Ω
$E_{oss@400V}$		

- Switching Applications

TO-220-3L Top View

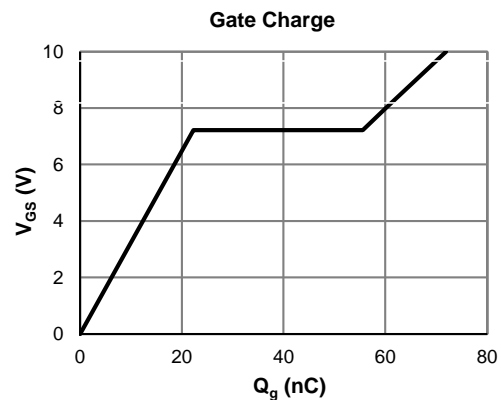
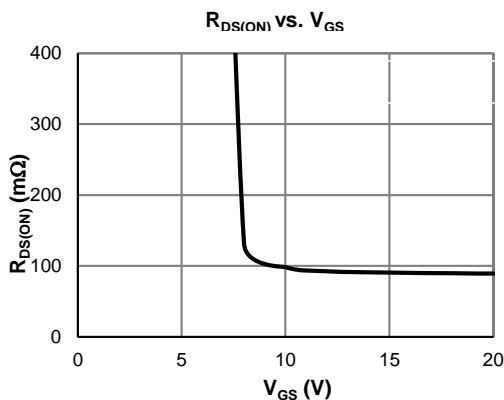


Ordering Information

Device							
JMH65R110ACFD-U							
JMH65R110AEFD-13							

Absolute Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise specified)

Parameter		Value	
Drain-to-Source Voltage		650	
Gate-to-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current ⁽¹⁾	$T_C = 25^\circ C$	35	A
	$T_C = 100^\circ C$	21	
Pulsed Drain Current ⁽²⁾	I_{DM}	137	A
Avalanche Current ⁽³⁾	I_{AS}	10.0	A
Avalanche Energy ⁽³⁾	E_{AS}	500	mJ
Power Dissipation ⁽⁴⁾	$T_C = 25^\circ C$	313	W
	$T_C = 100^\circ C$	125	
Junction & Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$



Electrical Characteristics (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	650		10V, I	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 650\text{V}$, $V_{GS} = 0\text{V}$			10.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 30\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	2.5	3.5	4.5	V
Static Drain-Source ON-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 10\text{A}$		98	110	$\text{m}\Omega$
			TO-263-3L TO-220-3L	99	110	$\text{m}\Omega$
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$		0.75		V
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$		$= 10\text{V}/\text{V}$	10	A
DYNAMIC PARAMETERS ⁽⁵⁾						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 100\text{V}$, $f = 1\text{MHz}$		2869		pF
Output Capacitance	C_{oss}			93		pF
Effective output capacitance, energy related	$C_{o(er)}$			97		pF
Effective output capacitance, time related	$C_{o(tr)}$			410		pF
Reverse Transfer Capacitance	C_{rss}	$V_{GS} = 0\text{V}$, $V_{DS} = 100\text{V}$, $f = 1\text{MHz}$		5.4		pF
Gate Resistance	R_g			2.2		Ω
SWITCHING PARAMETERS ⁽⁵⁾						
	Q_g			72		nC
	Q_{gs}			22		nC
	Q_{gd}			33		nC
	$t_{D(on)}$			29		ns
	t_r			30		ns
	$t_{D(off)}$			77		ns
	t_f			17.4		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 10\text{A}$, $dI_F/dt = 100\text{A}/\mu\text{s}$		152		ns
Body Diode Reverse Recovery Charge	Q_{rr}			2.5		μC
	dv/dt			15.0		V/ns
	dv/dt			50		V/ns

Parameter	Symbol	Unit
	$R_{\theta JA}$	45 $^\circ\text{C}/\text{W}$
	$R_{\theta JC}$	$^\circ\text{C}/\text{W}$

Notes:

application board design.

Typical Electrical & Thermal Characteristics

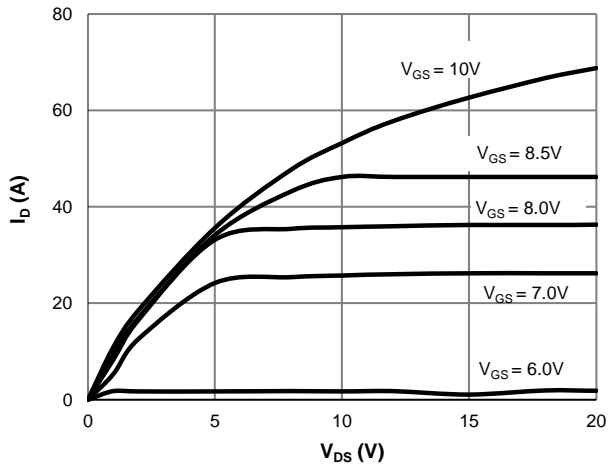


Figure 1: Saturation Characteristics

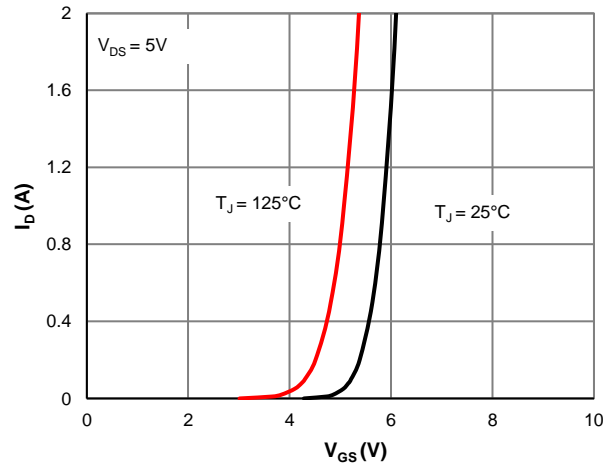


Figure 2: Transfer Characteristics

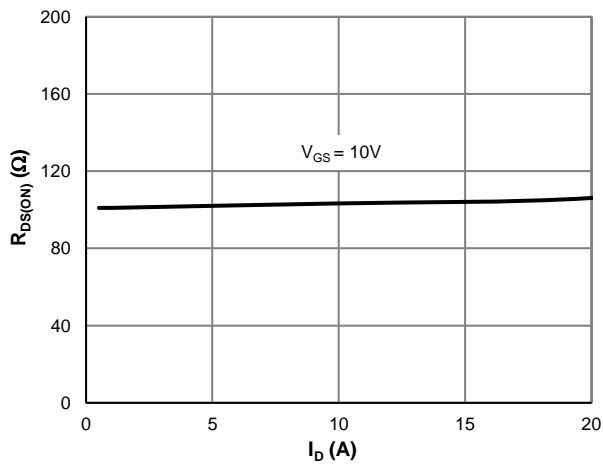


Figure 3: $R_{DS(ON)}$ vs. Drain Current

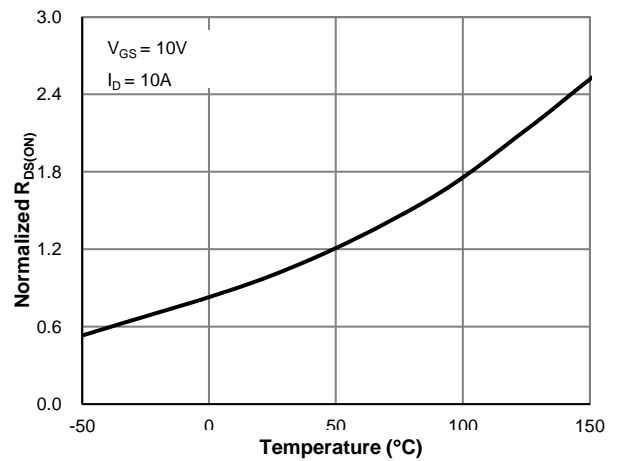


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

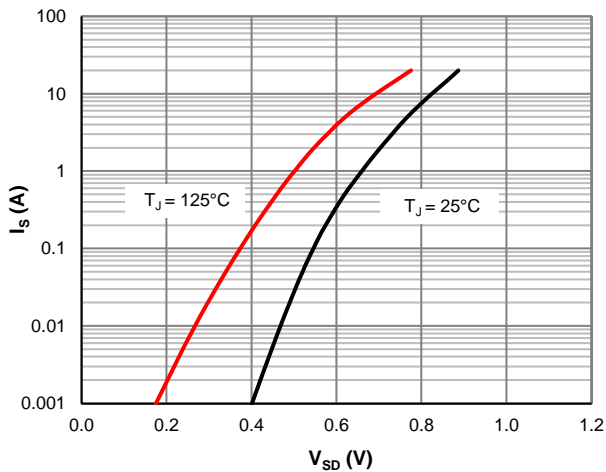


Figure 5: Body-Diode Characteristics

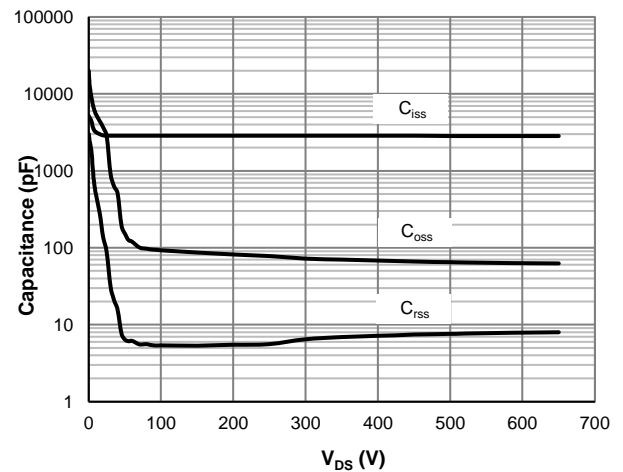


Figure 6: Capacitance Characteristics



Typical Electrical & Thermal Characteristics

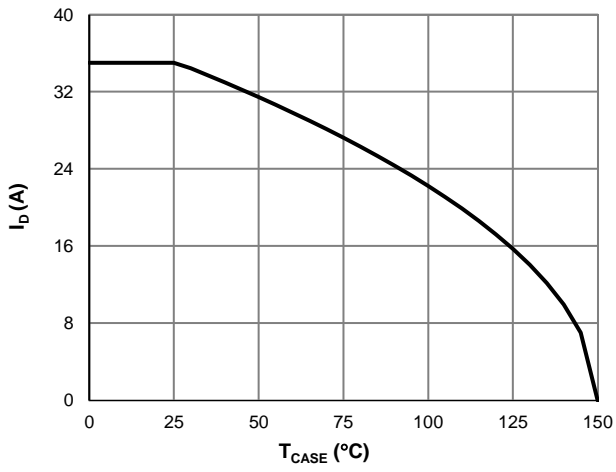


Figure 7: Current De-rating

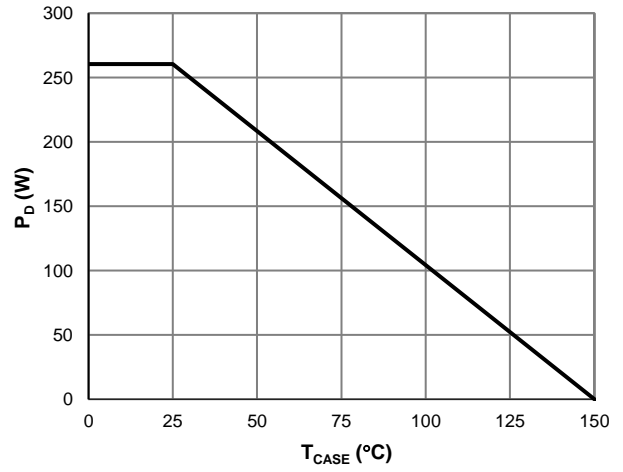


Figure 8: Power De-rating

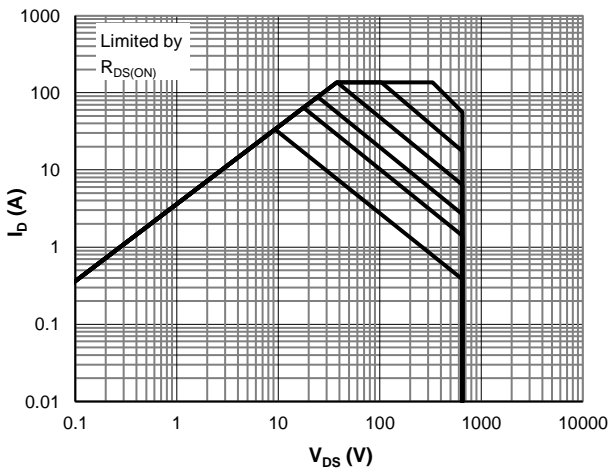
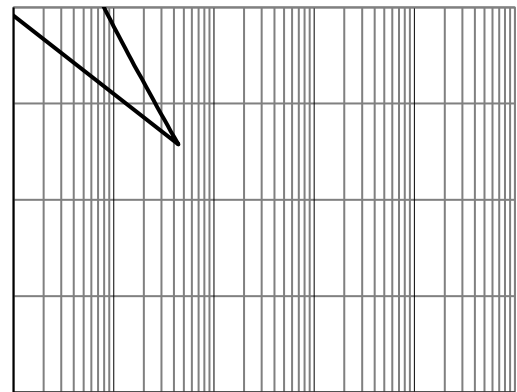
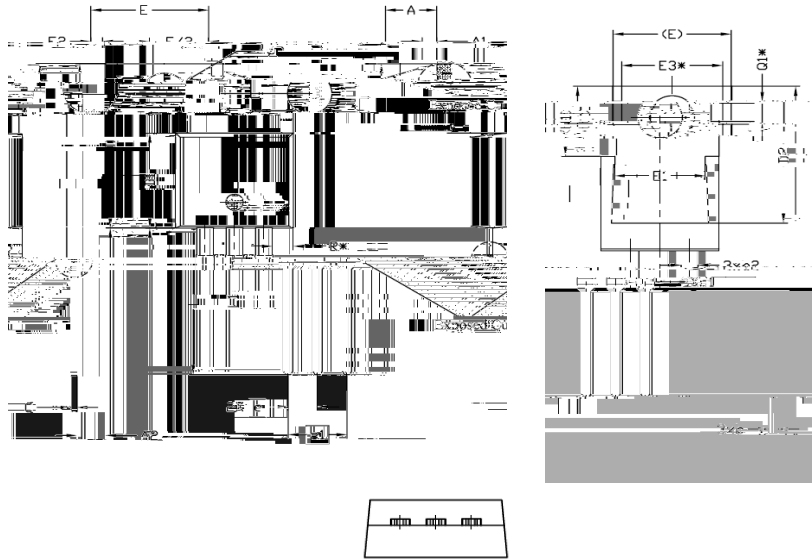


Figure 9: Maximum Safe Operating Area





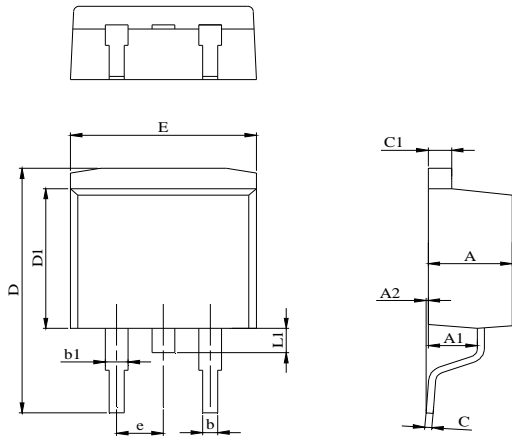
TO-220-3L Package Information



SYMBOL	DIMENSIONS (MILLIMETERS)		
	MIN.	NOM.	MAX.
A	4.24	4.44	4.64
A1	1.15	1.27	1.40
A2	2.30	2.48	2.70
b	0.70	0.80	0.90
b1	1.20	1.55	1.75
b2	1.20	1.45	1.70
c	0.40	0.50	0.60
D	14.70	15.37	16.00
D1	8.82	8.92	9.02
E	12.43	12.73	12.83
E1	9.50	9.80	10.30
E2	9.50	9.80	10.30
E3	—	8.40REF	—
e	—	2.54BSC	—
e1	—	5.08BSC	—
L	13.50	13.65	13.80
L1	3.80	3.80	4.00
ØP	3.75	3.84	3.93
Q	2.60	2.80	3.00
Q1*	—	1.03REF	—
ØR	—	1.03REF	—

TO-263-3L Package Information

Package Outline



Recommend Soldering Footprint

