JMH65R110ACFD
JMH65R110AEFD

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 and RoHS-compliant
- AEC-Q101 Qualified for Automotive Applications

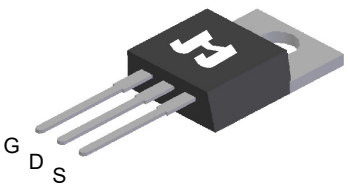
Product Summary

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	mΩ
E_{oss}@400V	7.77	μJ

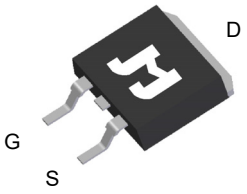
Applications

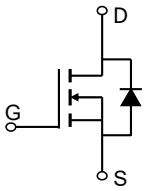
- Switching Applications

TO-220-3L Top View



TO-263-3L Top View



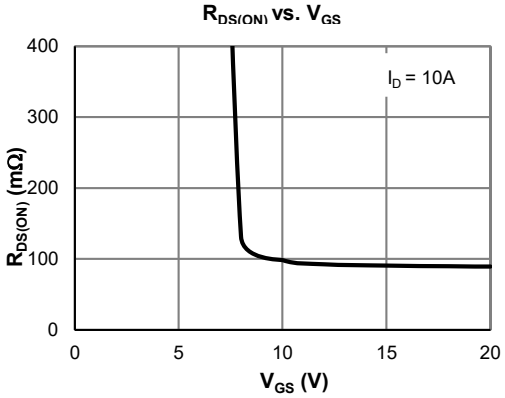


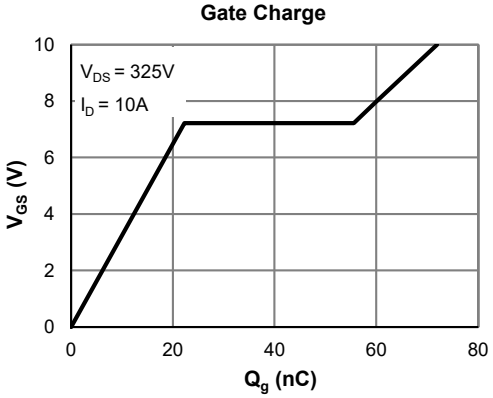
Ordering Information

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMH65R110ACFD-U	TO-220-3L	3	65R110AF	NA	-55 to 150	Tube	50
JMH65R110AEFD-13	TO-263-3L	3	65R110AF	3	-55 to 150	13-inch Reel	800

Absolute Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-to-Source Voltage		V_{DS}	650	V
Gate-to-Source Voltage		V_{GS}	±30	V
Continuous Drain Current (1)	T_C = 25°C	I_D	35	A
	T_C = 100°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°C	P_D	313	W
	T_C = 100°C		125	
Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C





Electrical Characteristics (@ T_J = 25°C unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0V		650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650V, V_{GS} = 0V				10.0	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V				±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA		2.5	3.5	4.5	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 10A	TO-263-3L		98	110	mΩ
			TO-220-3L		99	110	mΩ
Diode Forward Voltage	V_{SD}	I_S = 1A, V_{GS} = 0V			0.75		V
Diode Continuous Current	I_S	T_C = 25°C				10	A
DYNAMIC PARAMETERS (5)							
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 100V, f = 1MHz			2869		pF
Output Capacitance	C_{oss}				93		pF
Effective output capacitance, energy related	$C_{o(er)}$	V_{GS}=0V, V_{DS}=0...400V			97		pF
Effective output capacitance, time related	$C_{o(tr)}$	ID=constant, V_{GS}=0V, V_{DS}=0...400V			410		pF
Reverse Transfer Capacitance	C_{rss}	V_{GS} = 0V, V_{DS} = 100V, f = 1MHz			5.4		pF
Gate Resistance	R_g	f = 1MHz			2.2		Ω
SWITCHING PARAMETERS (5)							
Total Gate Charge (@ V_{GS} = 10V)	Q_g	V_{GS} = 0 to 10V V_{DS} = 325V, I_D = 10A			72		nC
Gate Source Charge	Q_{gs}				22		nC
Gate Drain Charge	Q_{gd}				33		nC
Turn-On DelayTime	$t_{D(on)}$	V_{GS} = 10V, V_{DS} = 325V R_L = 32.5Ω, R_{GEN} = 6Ω			29		ns
Turn-On Rise Time	t_r				30		ns
Turn-Off DelayTime	$t_{D(off)}$				77		ns
Turn-Off Fall Time	t_f				17.4		ns
Body Diode Reverse Recovery Time	t_{rr}	I_F = 10A, dI_F/dt = 100A/μs			152		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F = 10A, dI_F/dt = 100A/μs			2.5		μC
Peak Diode Recovery Voltage Slope	dv/dt	I_F≤2A, di/dt = 200A/us, V_{DS} = 400V			15.0		V/ns
MOSFET dv/dt Ruggedness	dv/dt	V_{DS} = 0...400V			50		V/ns

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	45	55	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.40	0.48	°C/W

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J_Max} = 150°C.
3. This single-pulse measurement was taken under the following condition [L = 10mH, V_{GS} = 10V, V_{DD} = 50V] while its value is limited by T_{J_Max} = 150°C.
4. The power dissipation P_D is based on T_{J_Max} = 150°C.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

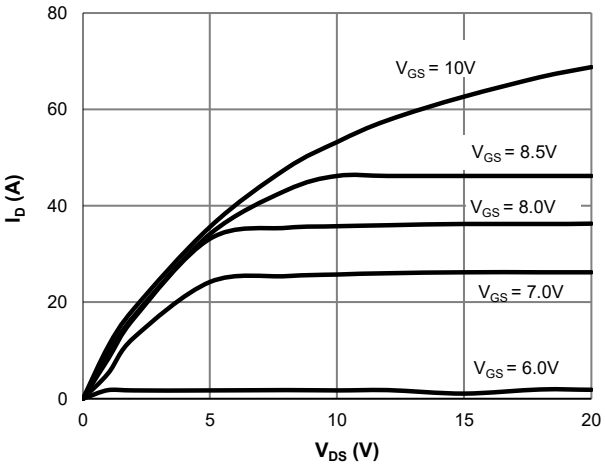


Figure 1: Saturation Characteristics

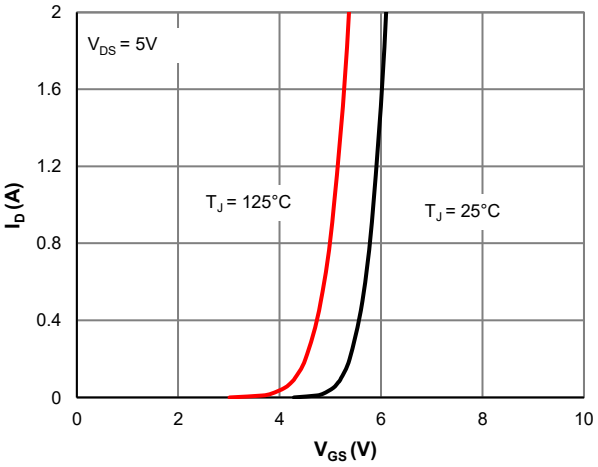


Figure 2: Transfer Characteristics

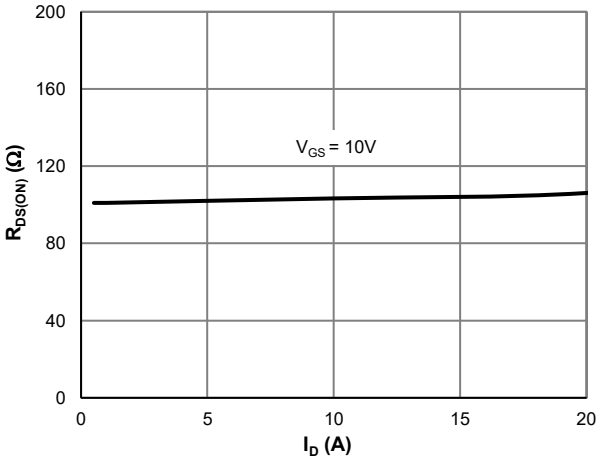


Figure 3: $R_{DS(ON)}$ vs. Drain Current

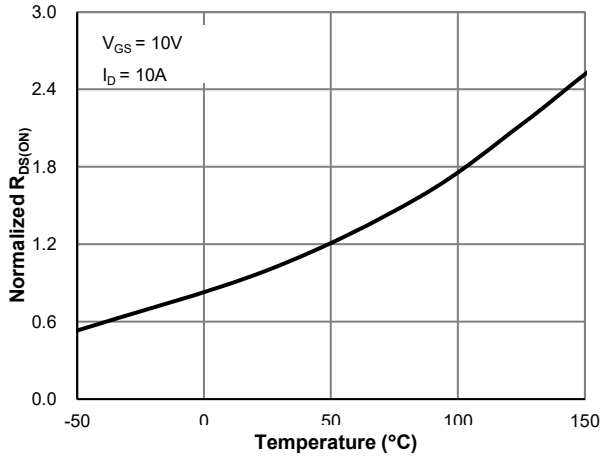


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

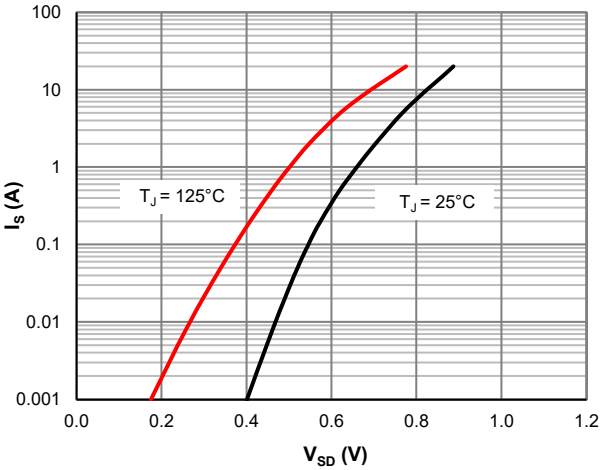


Figure 5: Body-Diode Characteristics

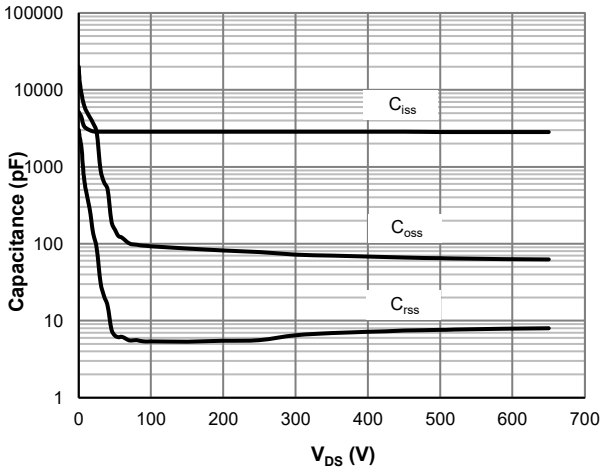


Figure 6: Capacitance Characteristics

Typical Electrical & Thermal Characteristics

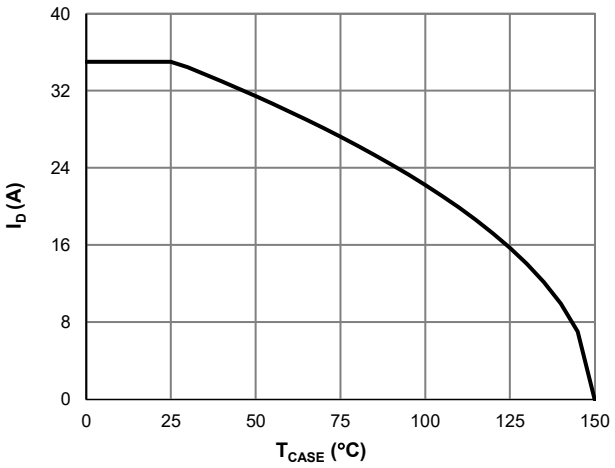


Figure 7: Current De-rating

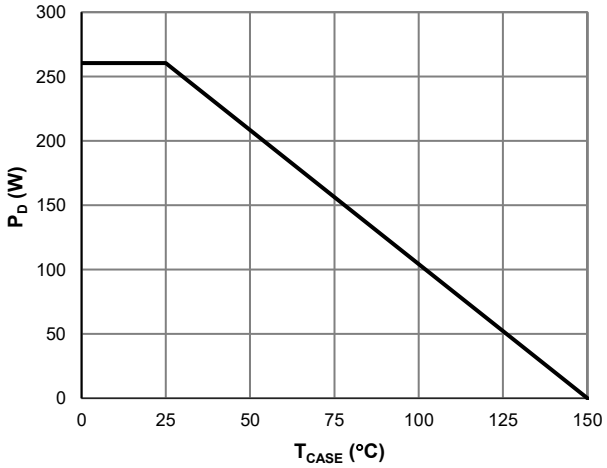


Figure 8: Power De-rating

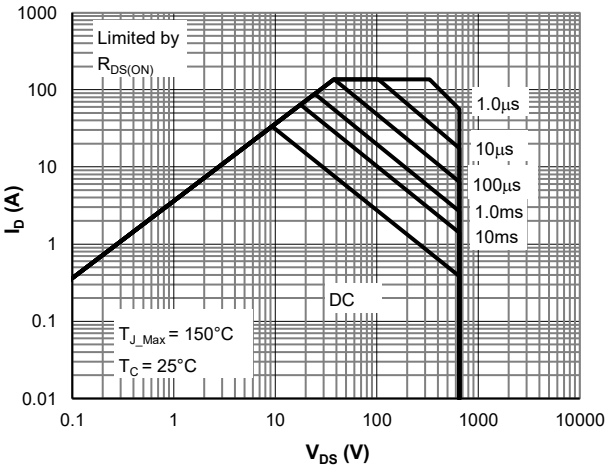


Figure 9: Maximum Safe Operating Area

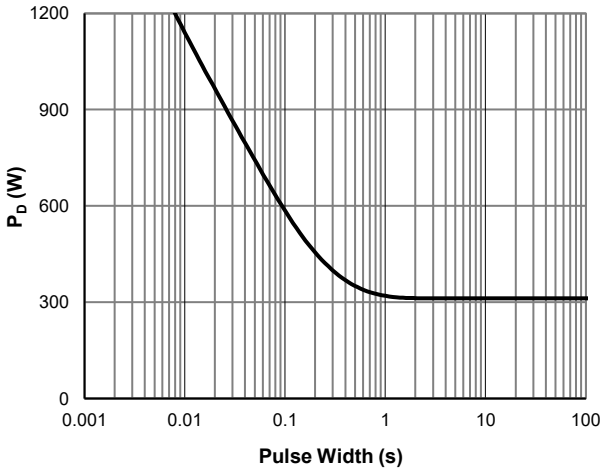


Figure 10: Single Pulse Power Rating, Junction-to-Case

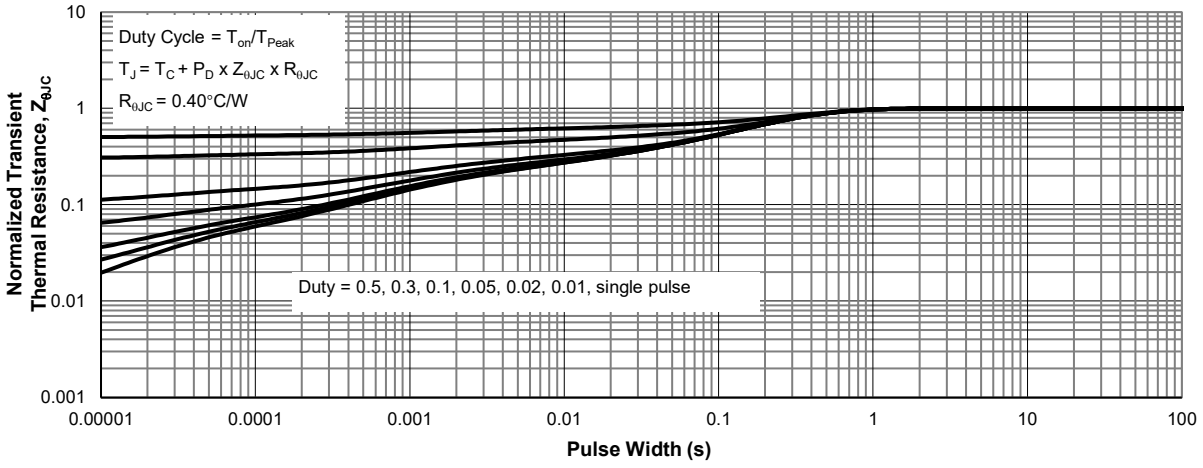
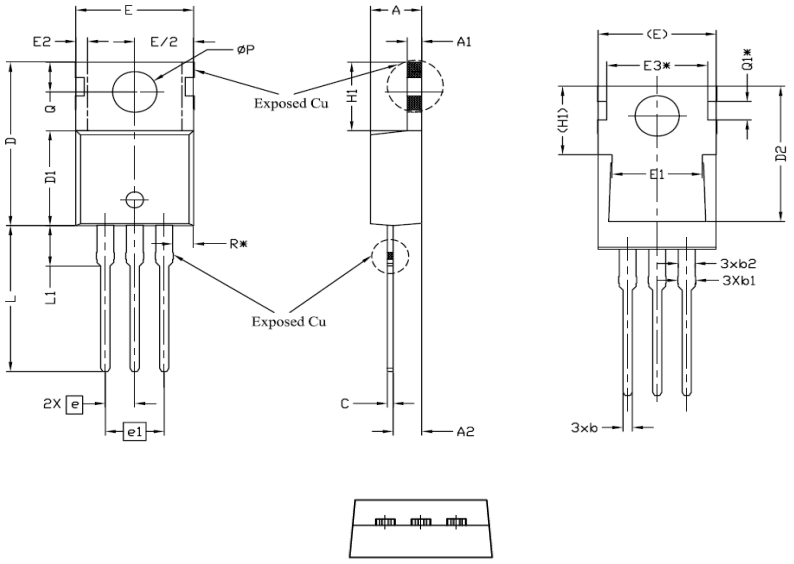


Figure 11: Normalized Maximum Transient Thermal Impedance

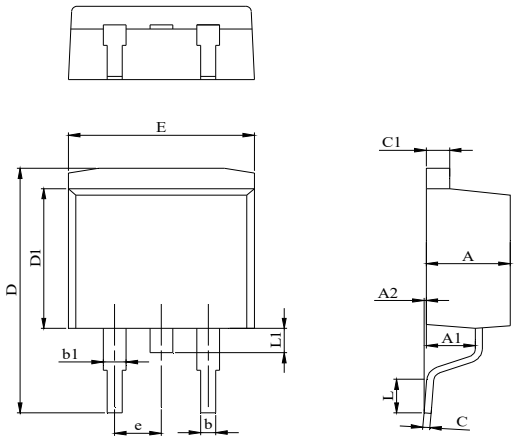
TO-220-3L Package Information



SYMBOL	DIMENSIONS			NOTES
	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	4
D1	8.82	8.92	9.02	
D2	12.43	12.73	12.83	5
E	9.96	10.16	10.36	4,5
E1	6.86	7.77	8.89	5
E2	-	-	0.76	6
E3*	8.70REF.			
e	2.54BSC			
e1	5.08BSC			
H1	6.30	6.45	6.60	5,6
L	13.47	13.72	13.97	
L1	3.60	3.80	4.00	
øP	3.75	3.84	3.93	
Q	2.60	2.80	3.00	
Q1*	1.73REF.			
R*	1.82REF.			

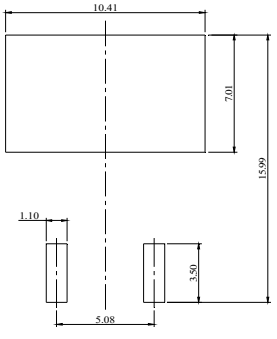
TO-263-3L Package Information

Package Outline



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.24		4.77
A1	2.30		2.89
A2	0.00	0.10	0.25
b	0.70		0.96
b1	1.17		1.70
C	0.30		0.60
C1	1.15		1.42
D	14.10		15.88
D1	8.50		9.60
E	9.78		10.36
L	1.78		2.79
L1			1.75
e		2.54	

Recommend Soldering Footprint



DIMENSIONS: MILLIMETERS