



Product Summary

	Value	Unit
	100	V
	3.0	V
	369	A
	2.0	m

Package	# of Pins	Marking	MSL	T _J (°C)	Media	Quantity (pcs)
PowerJE@10x12	8	SH1002N	1	-55 to 175	13-inch Reel	2000

		Symbol		Unit
Continuous Drain Current ⁽¹⁾	T _C = 25°C	V _{DS}		V
		V _{GS}		V
	T _C = 100°C	I _D	369	
			261	
Pulsed Drain Current ⁽²⁾		I _{DM}	1476	A
Avalanche Energy ⁽³⁾		E _{AS}	1350	mJ
				W
	T _C = 100°C		300	
Junction & .34 5280		T _J , T _{STG}		°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	$V_{(BR)DSS}$	$I_D = 250\text{ A}$, $V_{GS} = 0\text{ V}$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{ V}$, $V_{GS} = 0\text{ V}$ $T_J = 55^\circ\text{C}$			1.0 5.0	A
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ A}$	2.0	3.0	4.0	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$		2.0	2.4	m
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{ V}$, $I_D = 20\text{ A}$		67		S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{ A}$, $V_{GS} = 0\text{ V}$		0.66	1.0	V
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$			369	A
DYNAMIC PARAMETERS ⁽⁵⁾						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 50\text{ V}$, $f = 1\text{ MHz}$		9256		pF
Output Capacitance	C_{oss}			1318		pF
Reverse Transfer Capacitance	C_{rss}			30		pF
Gate Resistance	R_g	$V_{GS} = 0\text{ V}$, $V_{DS} = 0\text{ V}$, $f = 1\text{ MHz}$		1.0		
SWITCHING PARAMETERS ⁽⁵⁾						
Total Gate Charge (@ $V_{GS} = 10\text{ V}$)	Q_g	$V_{GS} = 0\text{ to }10\text{ V}$ $V_{DS} = 50\text{ V}$, $I_D = 20\text{ A}$		131		nC
Total Gate Charge (@ $V_{GS} = 6.0\text{ V}$)	Q_g			83		nC
Gate Source Charge	Q_{gs}			46		nC
Gate Drain Charge	Q_{gd}			27		nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 50\text{ V}$ $R_L = 2.5\text{ }\Omega$, $R_{GEN} = 3\text{ }\Omega$		33		ns
Turn-On Rise Time	t_r			33		ns
Turn-Off DelayTime	$t_{D(off)}$			63		ns
Turn-Off Fall Time	t_f			23		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20\text{ A}$, $dI_F/dt = 100\text{ A/s}$		91		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 20\text{ A}$, $dI_F/dt = 100\text{ A/s}$		250		nC

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R_{JA}	45	55	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	R_{JC}	0.25	0.28	$^\circ\text{C/W}$

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 $T_{J_Max} = 175^\circ\text{C}$.
3. E_{AS} of 1350 mJ is based on starting $T_J = 25^\circ\text{C}$, $L = 3.0\text{ mH}$, $I_{AS} = 30\text{ A}$, $V_{GS} = 10\text{ V}$, $V_{DD} = 50\text{ V}$; 100% test at $L = 0.3\text{ mH}$, $I_{AS} = 62\text{ A}$.
4. The power dissipation P_D is based on $T_{J_Max} = 175^\circ\text{C}$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

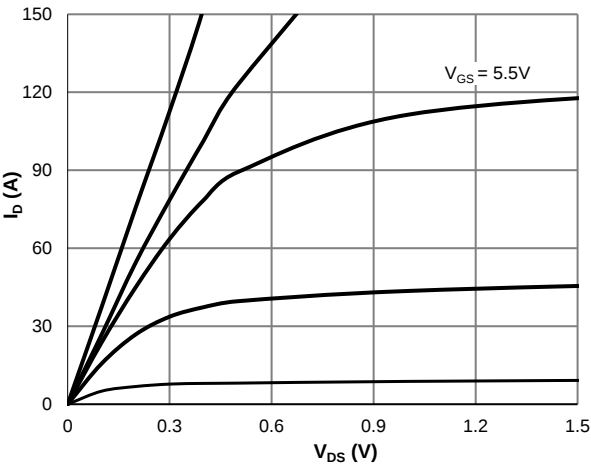


Figure 1: Saturation Characteristics

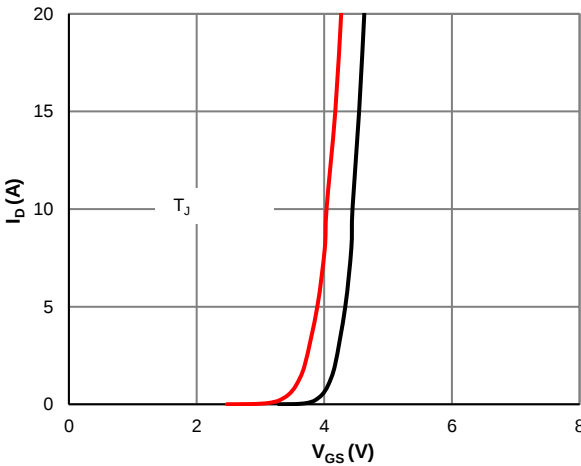


Figure 2: Transfer Characteristics

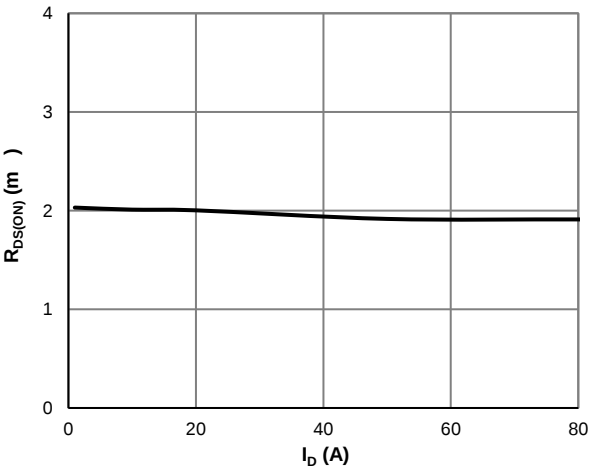


Figure 3: $R_{DS(ON)}$ vs. Drain Current



Typical Electrical & Thermal Characteristics

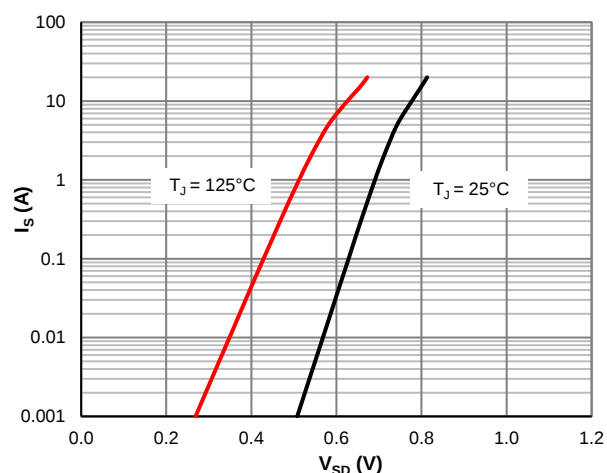


Figure 7: Body-Diode Characteristics

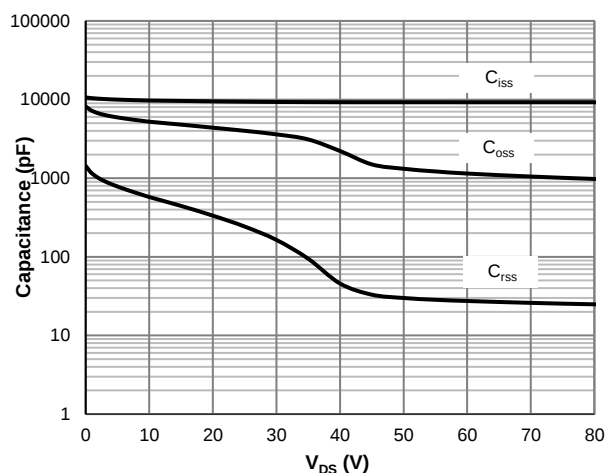


Figure 8: Capacitance Characteristics

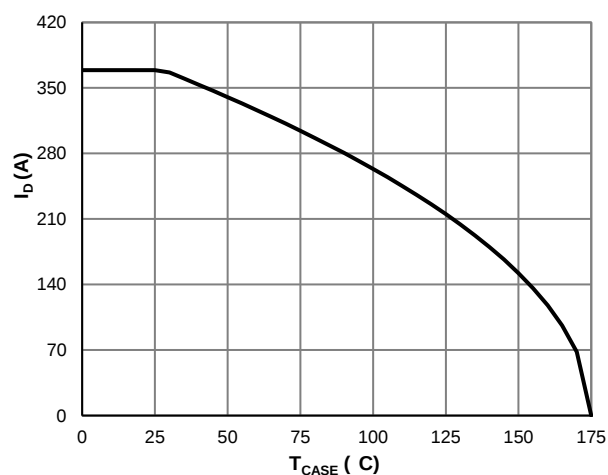


Figure 9: Current De-rating

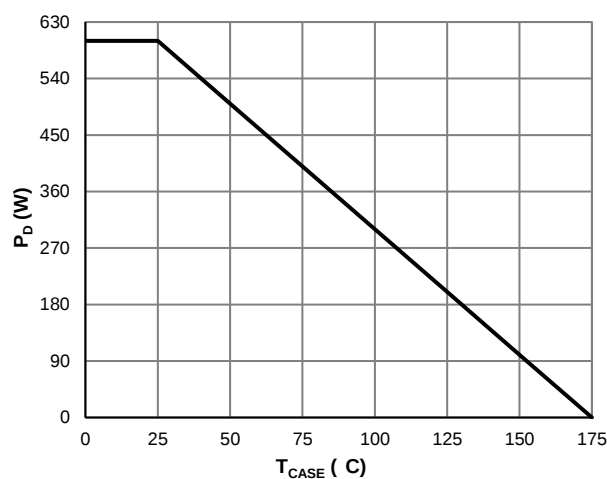


Figure 10: Power De-rating

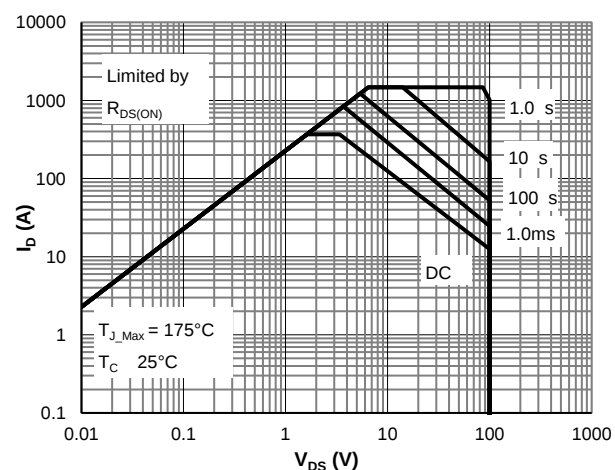


Figure 11: Maximum Safe Operating Area

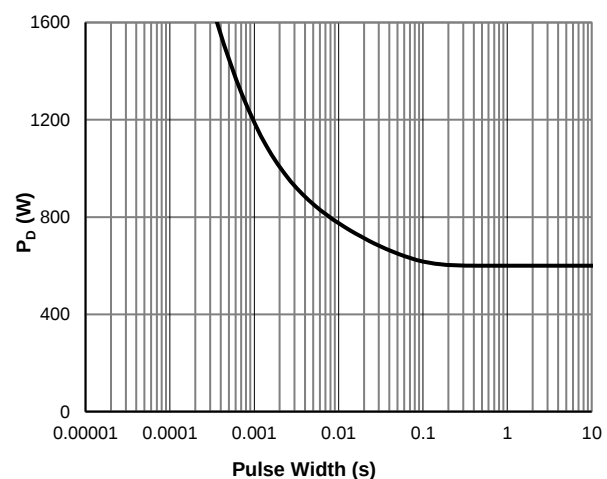


Figure 12: Single Pulse Power Rating, Junction-to-Case



Typical Electrical & Thermal Characteristics

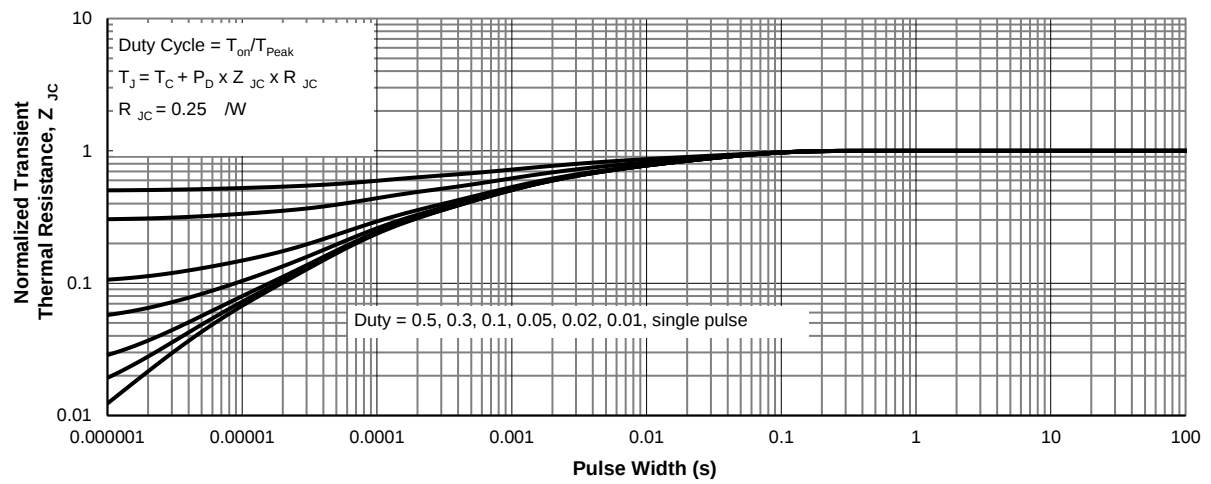


Figure 13: Normalized Maximum Transient Thermal Impedance



PowerJE® 10x12 Package Information

