



**THE DATASHEET OF  
SIZ916DT-T1-GE3**







<b>SPECIFICATIONS</b> ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)									
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT			
<b>Static</b>									
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	Ch-1	30	-	-	V		
		$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	Ch-2	30	-	-			
$V_{DS}$ Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$	Ch-1	-	17	-	mV/ $^\circ\text{C}$		
		$I_D = 250\text{ }\mu\text{A}$	Ch-2	-	8.8	-			
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	$I_D = 250\text{ }\mu\text{A}$	Ch-1	-	-5	-			
		$I_D = 250\text{ }\mu\text{A}$	Ch-2	-	-5.9	-			
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	Ch-1	1.2	-	2.4	V		
		$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	Ch-2	1	-	2.4			
Gate Source Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = +20\text{ V}, -14\text{ V}$	Ch-1	-	-	$\pm 100$	nA		
			Ch-2	-	-	$\pm 100$			
Zero Gate Voltage Drain Current	$I_{DSS}$	$V = 30\text{ V}, V_{DS\ GS} = 0\text{ V}$	Ch-1	-	-	1	$\mu\text{A}$		
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	Ch-2	-	-	1			
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$	Ch-1	-	-	5			
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$	Ch-2	-	-	5			
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	Ch-1	20	-	-	A		
		$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	Ch-2	25	-	-			
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 19\text{ A}$	Ch-1	-	0.00530	0.00640	$\Omega$		
		$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	Ch-2	-	0.00105	0.00130			
		$V_{GS} = 4.5\text{ V}, I_D = 15\text{ A}$	Ch-1	-	0.00800	0.01000			
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$	Ch-2	-	0.00140	0.00175			
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 10\text{ V}, I_D = 19\text{ A}$	Ch-1	-	55	-	S		
		$V_{DS} = 10\text{ V}, I_D = 20\text{ A}$	Ch-2	-	116	-			
<b>Dynamic <sup>b</sup></b>									
Input Capacitance	$C_{iss}$	Channel-1 $V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$  Channel-2 $V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	Ch-1	-	1208	-	pF		
			Ch-2	-	8082	-			
Output Capacitance	$C_{oss}$		Ch-1	-	375	-			
			Ch-2	-	1961	-			
Reverse Transfer Capacitance	$C_{rss}$		Ch-1	-	30	-			
			Ch-2	-	227	-			
$C_r/C_i$ Ratio			Ch-1	-	0.025	0.050		-	
			Ch-2	-	0.028	0.056		-	
Total Gate Charge	$Q_g$		$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	Ch-1	-	17		26	nC
			$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	Ch-2	-	106		160	
Gate-Source Charge	$Q_{gs}$	Channel-1 $V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$	Ch-1	-	7.2	11			
			Ch-2	-	45	68			
		Channel-2 $V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$	Ch-1	-	3.6	-			
			Ch-2	-	23.2	-			
Gate-Drain Charge	$Q_{gd}$		Ch-1	-	0.94	-			
			Ch-2	-	5	-			
Output Charge	$Q_{oss}$	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}$	Ch-1	-	10	-			
			Ch-2	-	57.5	-			
Gate Resistance	$R_g$	$f = 1\text{ MHz}$	Ch-1	0.5	2.5	5	$\Omega$		
			Ch-2	0.2	1	2			



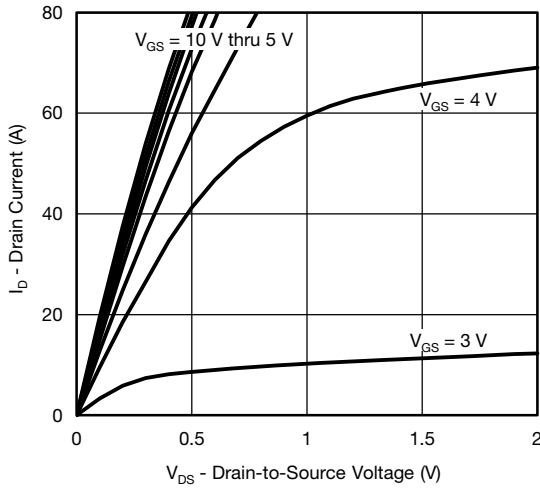
<b>SPECIFICATIONS</b> ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
<b>Dynamic <sup>b</sup></b>							
Turn-On Delay Time	$t_{d(on)}$	Channel-1 $V_{DD} = 15\text{ V}, R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\ \Omega$	Ch-1	-	16	24	ns
			Ch-2	-	36	54	
Rise Time	$t_r$	Channel-2 $V_{DD} = 15\text{ V}, R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\ \Omega$	Ch-1	-	11	20	
			Ch-2	-	55	83	
Turn-Off Delay Time	$t_{d(off)}$	Channel-1 $V_{DD} = 15\text{ V}, R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\ \Omega$	Ch-1	-	15	23	
			Ch-2	-	44	66	
Fall Time	$t_f$	Channel-2 $V_{DD} = 15\text{ V}, R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\ \Omega$	Ch-1	-	5	10	
			Ch-2	-	8	16	
Turn-On Delay Time	$t_{d(on)}$	Channel-1 $V_{DD} = 15\text{ V}, R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\ \Omega$	Ch-1	-	10	20	
			Ch-2	-	18	27	
Rise Time	$t_r$	Channel-2 $V_{DD} = 15\text{ V}, R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\ \Omega$	Ch-1	-	10	20	
			Ch-2	-	10	20	
Turn-Off Delay Time	$t_{d(off)}$	Channel-1 $V_{DD} = 15\text{ V}, R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\ \Omega$	Ch-1	-	20	30	
			Ch-2	-	45	68	
Fall Time	$t_f$	Channel-2 $V_{DD} = 15\text{ V}, R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\ \Omega$	Ch-1	-	5	10	
			Ch-2	-	8	16	
<b>Drain-Source Body Diode Characteristics</b>							
Continuous Source-Drain Diode Current	$I_S$	$T_C = 25\text{ }^\circ\text{C}$	Ch-1	-	-	40	A
			Ch-2	-	-	40	
Pulse Diode Forward Current <sup>a</sup>	$I_{SM}$		Ch-1	-	-	80	A
			Ch-2	-	-	100	
Body Diode Voltage	$V_{SD}$	$I_S = 10\text{ A}, V_{GS} = 0\text{ V}$	Ch-1	-	0.8	1.2	V
		$I_S = 10\text{ A}, V_{GS} = 0\text{ V}$	Ch-2	-	0.8	1.2	
Body Diode Reverse Recovery Time	$t_{rr}$	Channel-1 $I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$	Ch-1	-	15	23	ns
			Ch-2	-	65	98	
Body Diode Reverse Recovery Charge	$Q_{rr}$	Channel-2 $I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$	Ch-1	-	4	8	nC
			Ch-2	-	52	78	
Reverse Recovery Fall Time	$t_a$	Channel-1 $I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$	Ch-1	-	9	-	ns
			Ch-2	-	30	-	
Reverse Recovery Rise Time	$t_b$	Channel-2 $I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$	Ch-1	-	6	-	
			Ch-2	-	22	-	

**Notes**

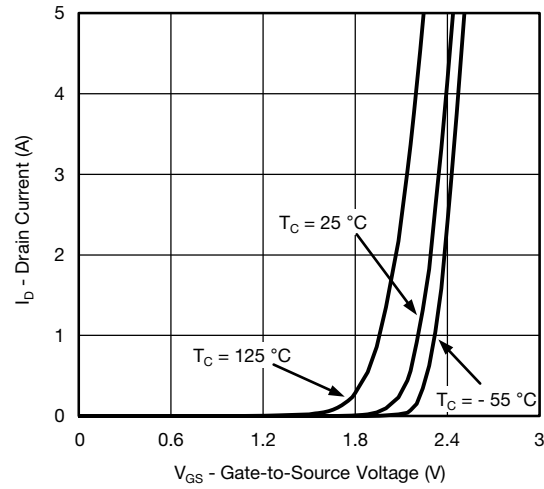
- a. Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

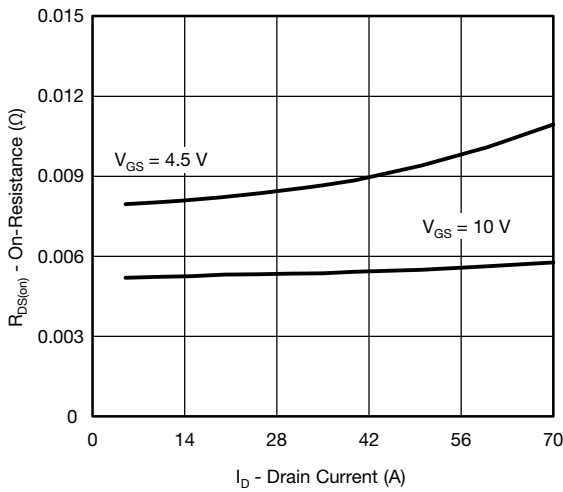
**CHANNEL-1 TYPICAL CHARACTERISTICS** ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



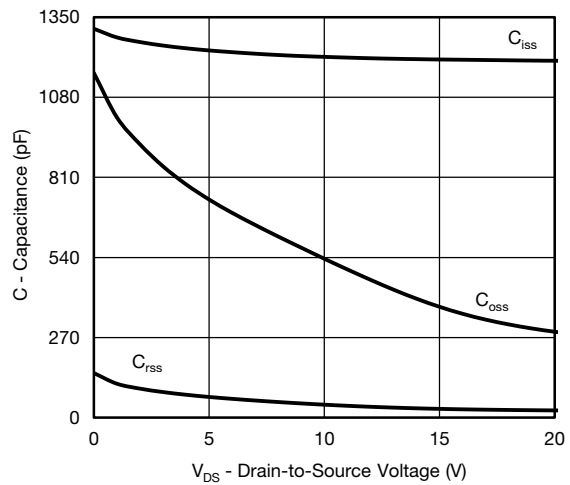
**Output Characteristics**



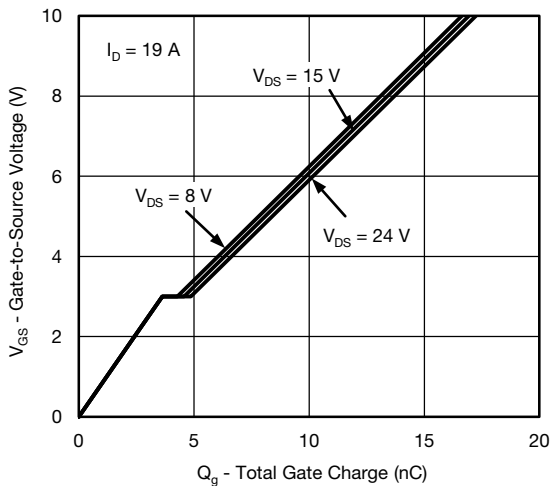
**Transfer Characteristics**



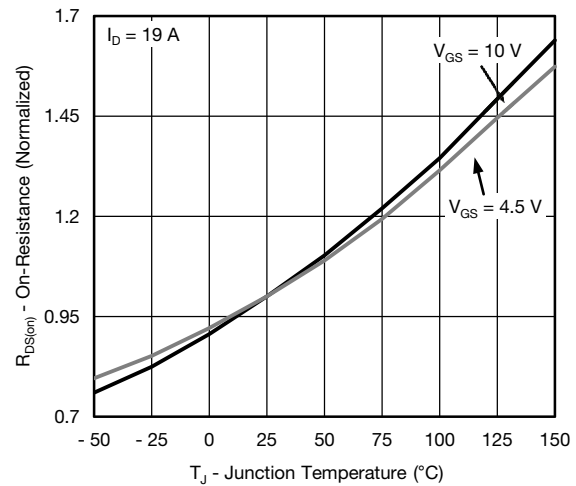
**On-Resistance vs. Drain Current**



**Capacitance**



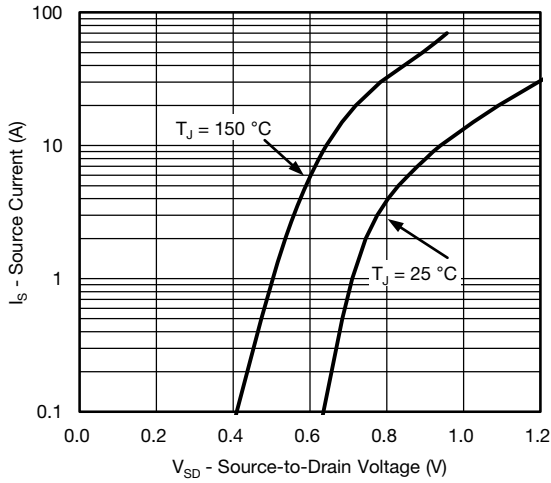
**Gate Charge**



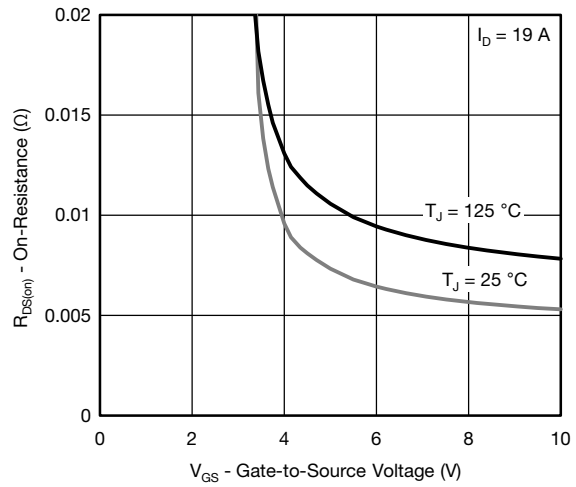
**On-Resistance vs. Junction Temperature**



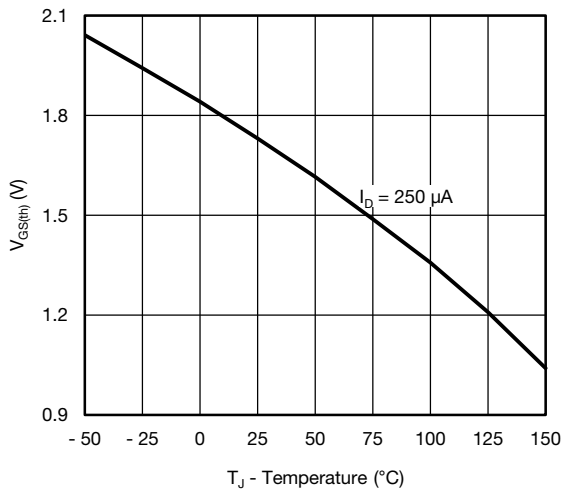
**CHANNEL-1 TYPICAL CHARACTERISTICS** ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



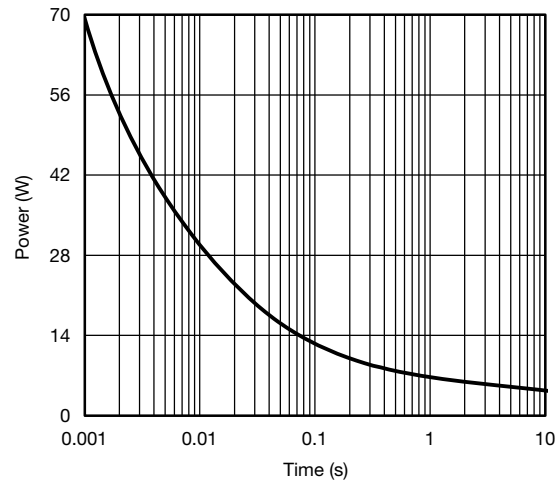
**Source-Drain Diode Forward Voltage**



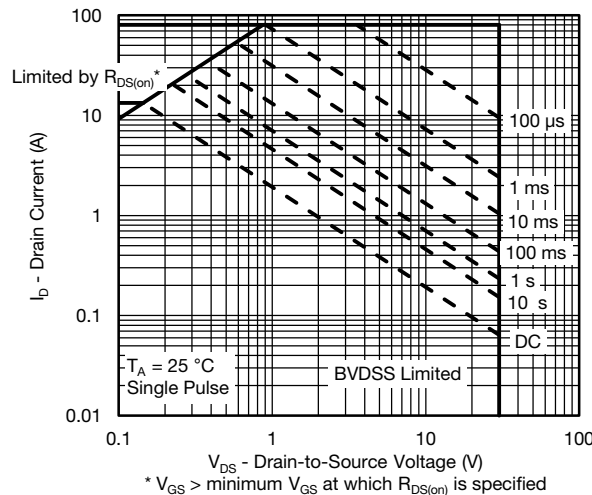
**On-Resistance vs. Gate-to-Source Voltage**



**Threshold Voltage**



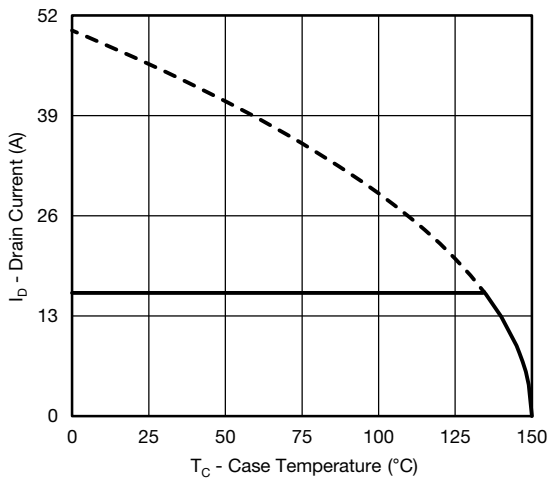
**Single Pulse Power**



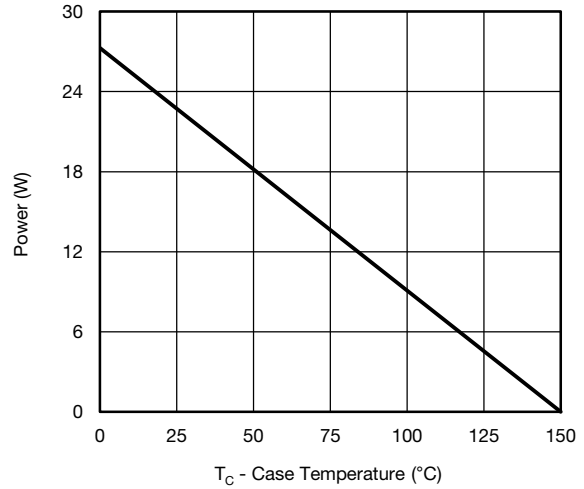
**Safe Operating Area, Junction-to-Ambient**



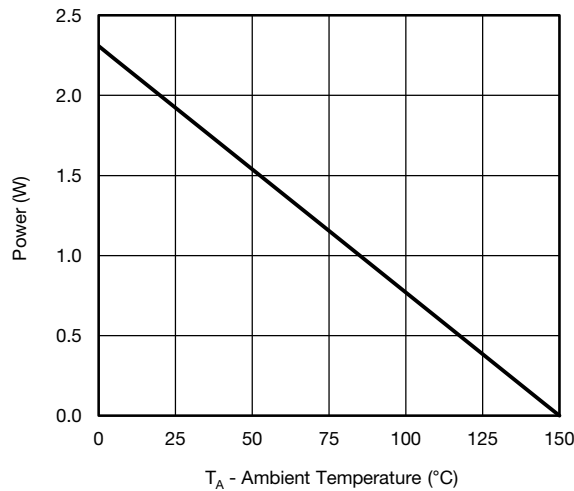
**CHANNEL-1 TYPICAL CHARACTERISTICS** ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



**Current Derating\***



**Power, Junction-to-Case**

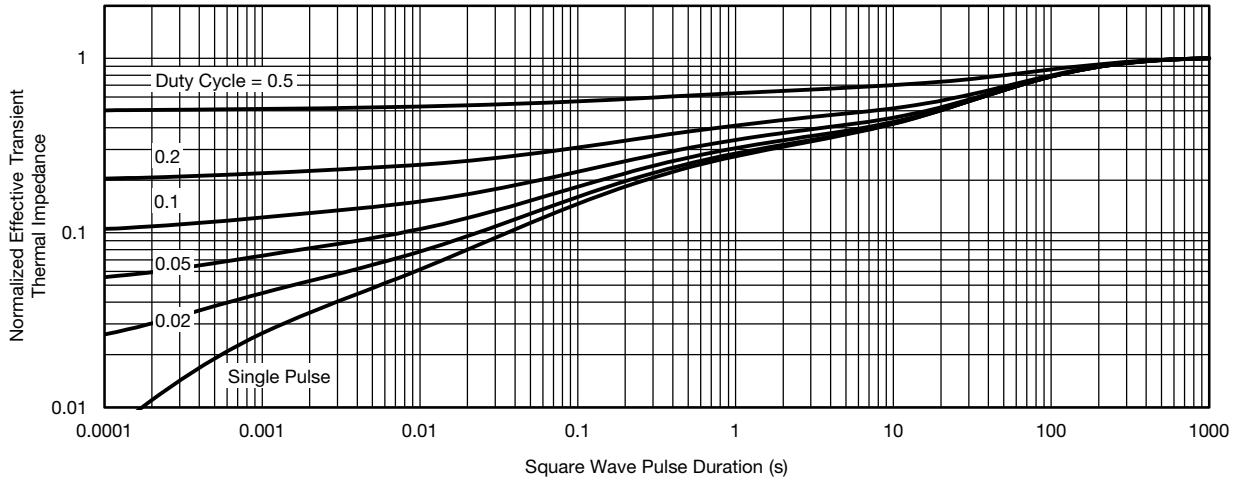


**Power, Junction-to-Ambient**

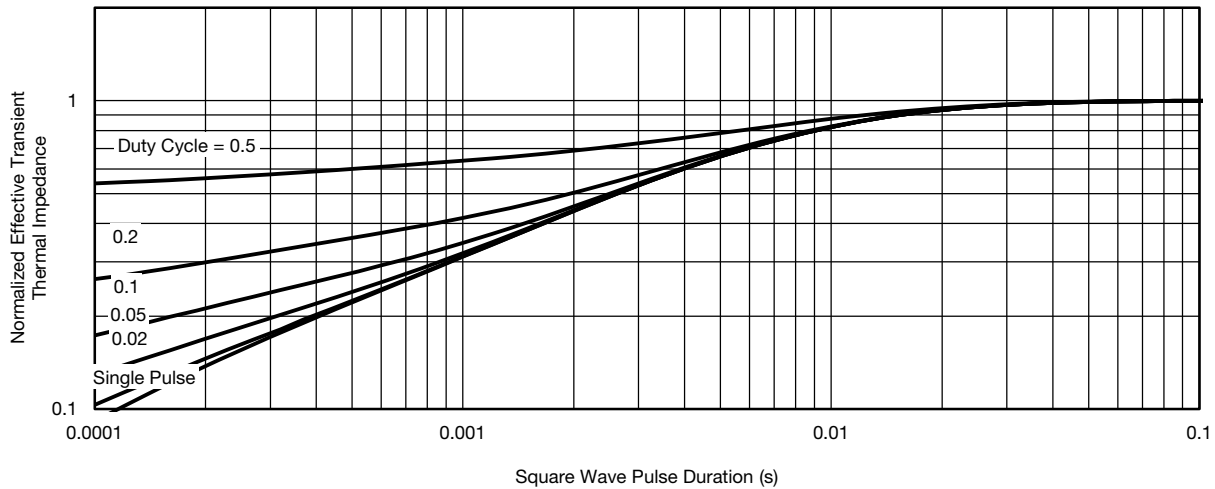
\* The power dissipation  $P_D$  is based on  $T_J$  (max.) =  $150\text{ }^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



**CHANNEL-1 TYPICAL CHARACTERISTICS** ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



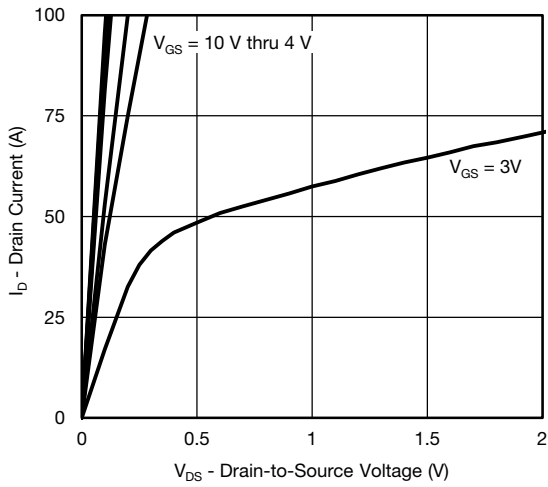
**Normalized Thermal Transient Impedance, Junction-to-Ambient**



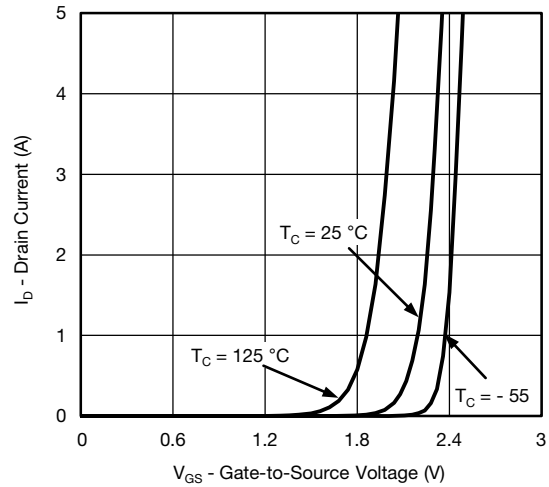
**Normalized Thermal Transient Impedance, Junction-to-Case**



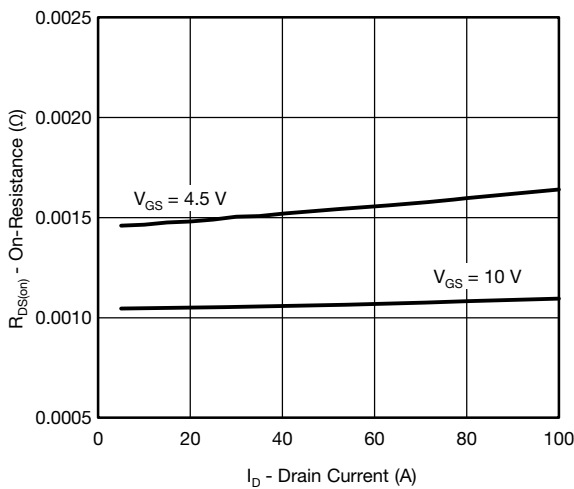
CHANNEL-2 TYPICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, unless otherwise noted)



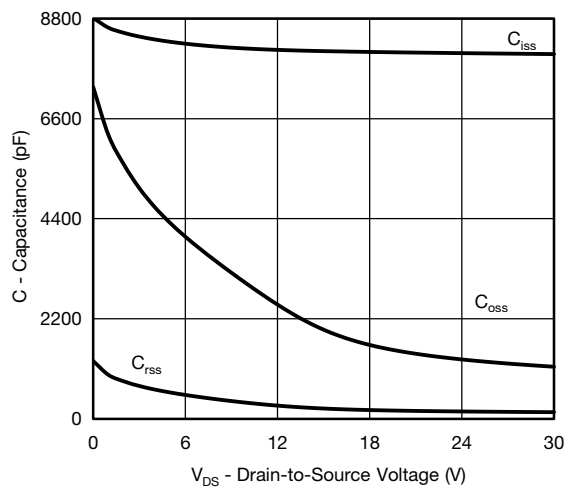
Output Characteristics



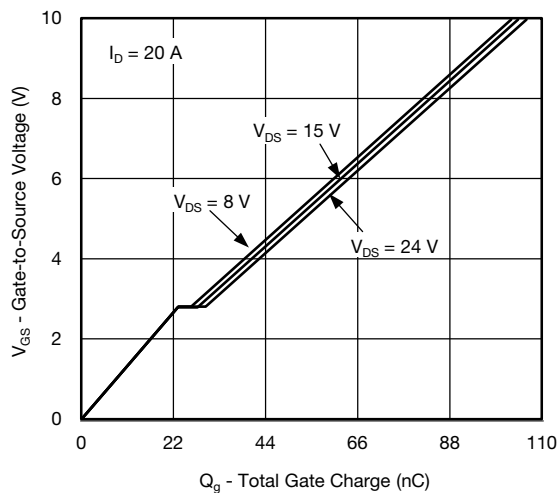
Transfer Characteristics



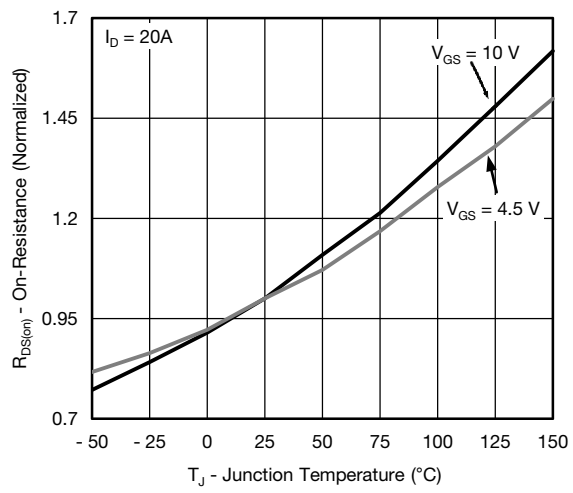
On-Resistance vs. Drain Current



Capacitance



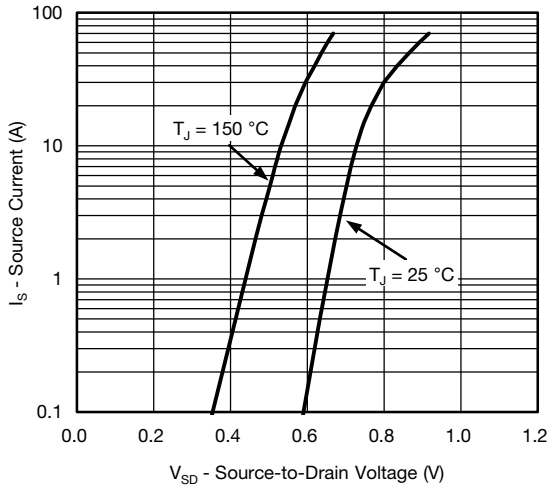
Gate Charge



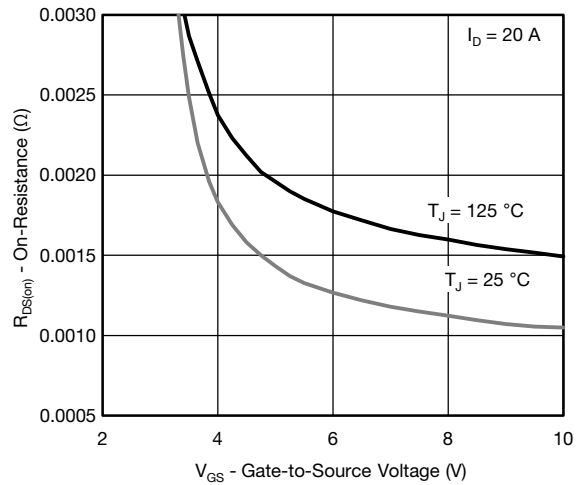
On-Resistance vs. Junction Temperature



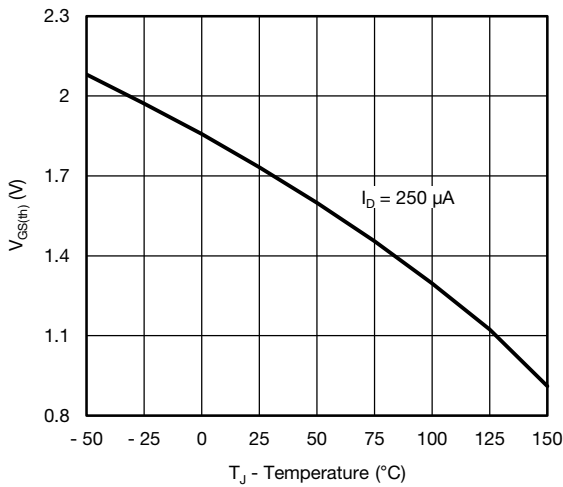
**CHANNEL-2 TYPICAL CHARACTERISTICS** ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



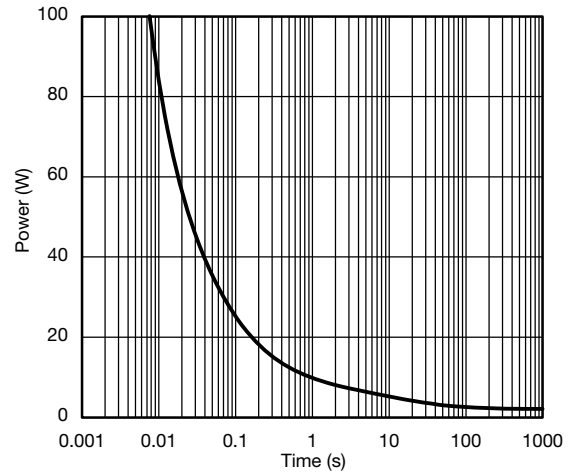
**Source-Drain Diode Forward Voltage**



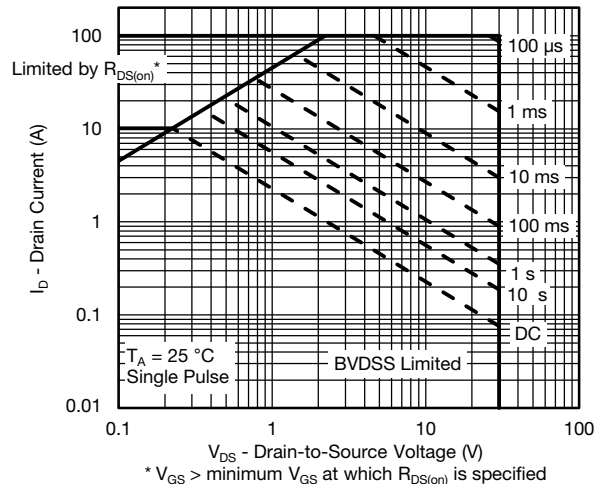
**On-Resistance vs. Gate-to-Source Voltage**



**Threshold Voltage**



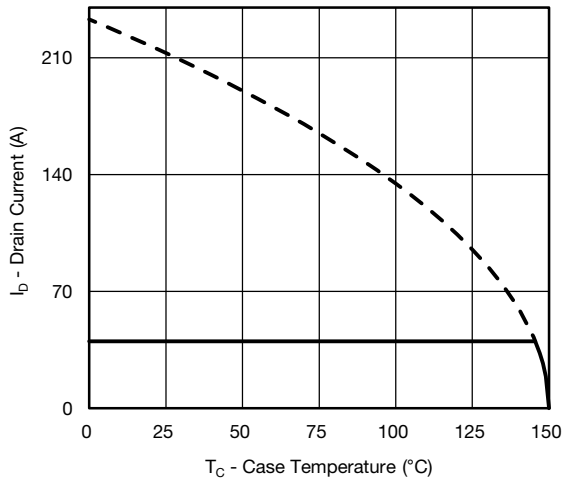
**Single Pulse Power**



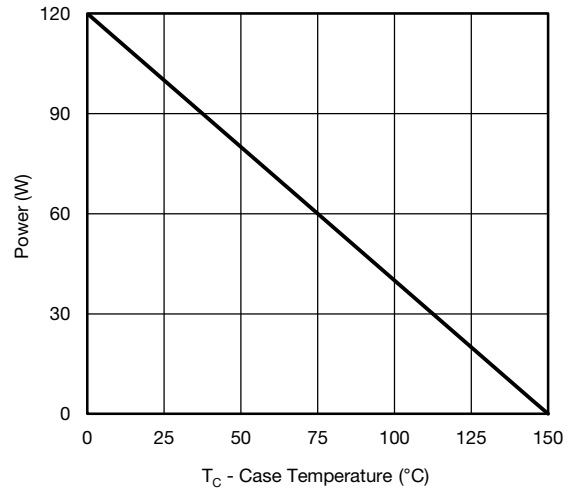
**Safe Operating Area, Junction-to-Ambient**



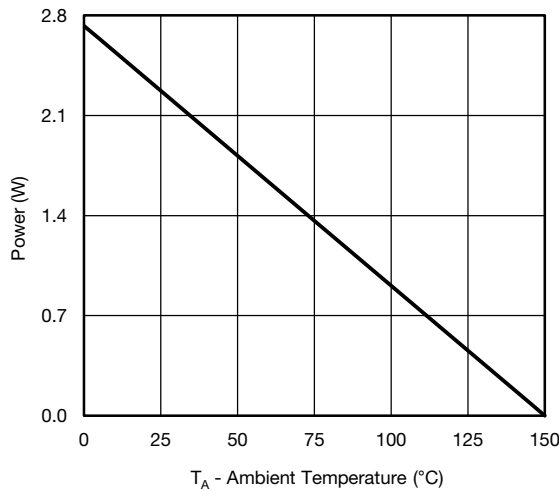
**CHANNEL-2 TYPICAL CHARACTERISTICS** ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)



**Current Derating\***



**Power, Junction-to-Case**

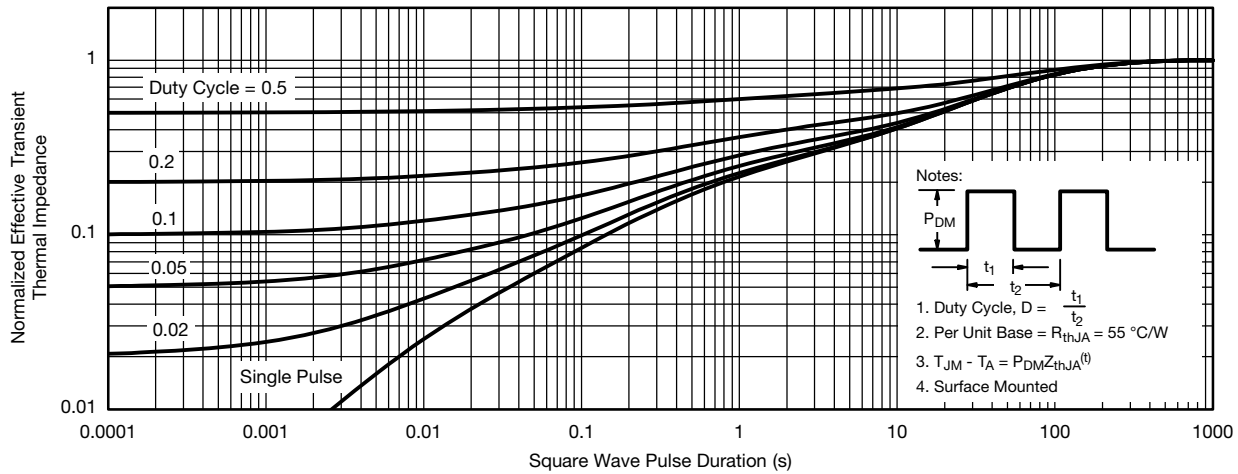


**Power, Junction-to-Ambient**

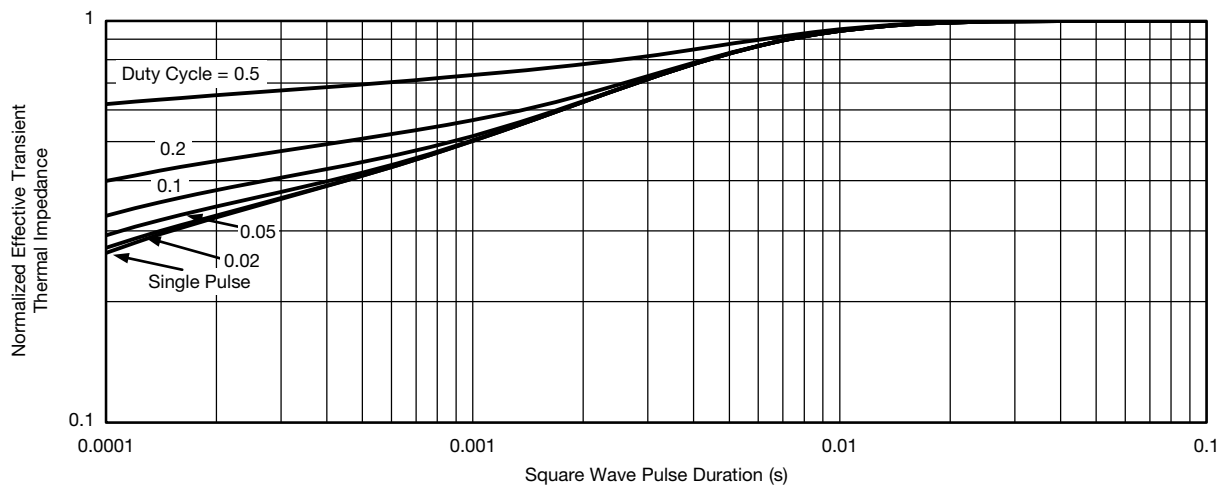
\* The power dissipation  $P_D$  is based on  $T_J$  (max.) =  $150\text{ }^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



CHANNEL-2 TYPICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, unless otherwise noted)



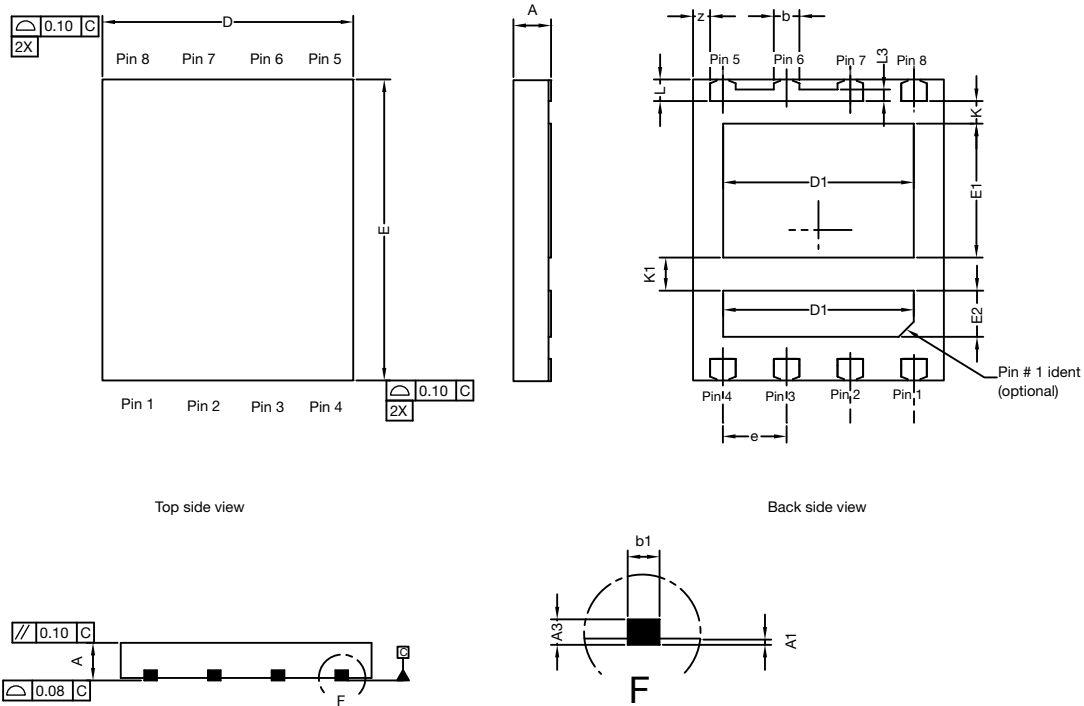
Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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## PowerPAIR® 6 x 5 Case Outline

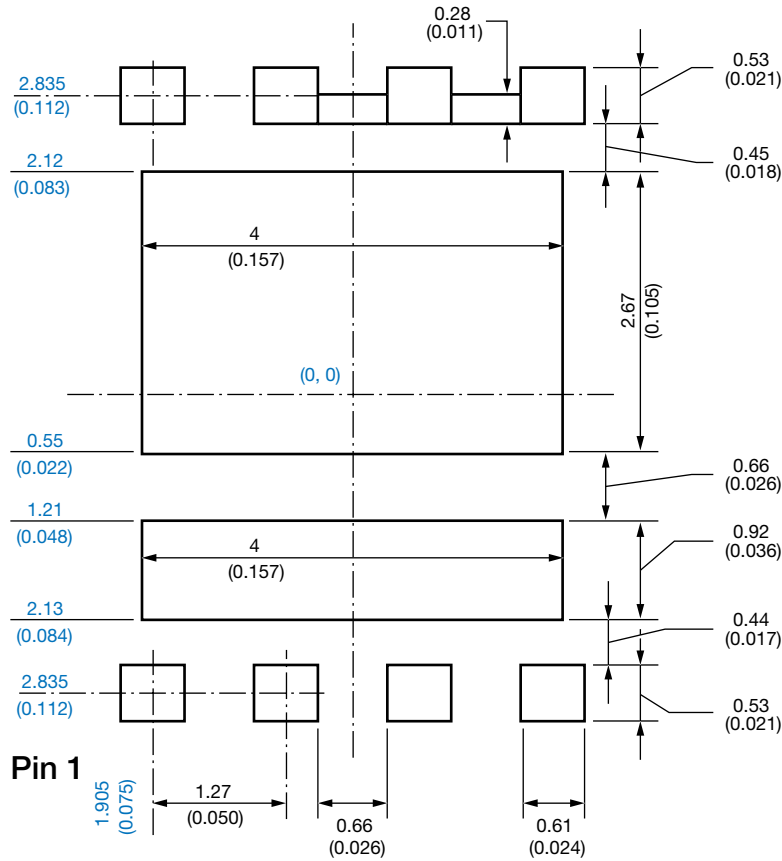


Top side view

Back side view

DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	0.028	0.030	0.032
A1	0.00	-	0.10	0.000	-	0.004
A3	0.15	0.20	0.25	0.006	0.007	0.009
b	0.43	0.51	0.61	0.017	0.020	0.024
b1	0.25 BSC			0.010 BSC		
D	4.90	5.00	5.10	0.192	0.196	0.200
D1	3.75	3.80	3.85	0.148	0.150	0.152
E	5.90	6.00	6.10	0.232	0.236	0.240
E1 Option AA (for W/B)	2.62	2.67	2.72	0.103	0.105	0.107
E1 Option AB (for BWL)	2.42	2.47	2.52	0.095	0.097	0.099
E2	0.87	0.92	0.97	0.034	0.036	0.038
e	1.27 BSC			0.050 BSC		
K Option AA (for W/B)	0.45 typ.			0.018 typ.		
K Option AB (for BWL)	0.65 typ.			0.025 typ.		
K1	0.66 typ.			0.025 typ.		
L	0.33	0.43	0.53	0.013	0.017	0.020
L3	0.23 BSC			0.009 BSC		
z	0.34 BSC			0.013 BSC		
ECN: T14-0782-Rev. C, 22-Dec-14						
DWG: 6005						

**Recommended Minimum PAD for PowerPAIR® 6 x 5**



Dimensions in millimeters (inch)

**Note**

- Linear dimensions are in black, the same information is provided in ordinate dimensions which are in blue.



## Disclaimer

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