N- and P-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY			
	V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.299 at V_{GS} = 4.5 V	1.2
		0.426 at V_{GS} = 2.5 V	0.9
P-Channel	- 20	0.689 at V_{GS} = - 4.5 V	- 0.5
		0.873 at V_{GS} = - 2.5 V	- 0.4

FEATURES

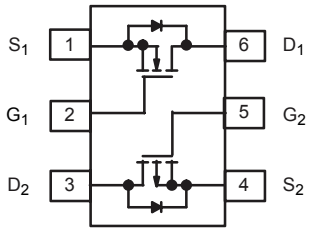
- **Halogen-free According to IEC 61249-2-21 Definition**
- TrenchFET® Power MOSFET
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC

Pb-free

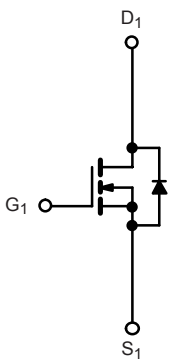
RoHS COMPLIANT

HALOGEN FREE Available

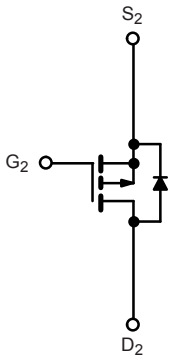
SOT-563



Top View



N-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted					
Parameter		**Symbol**	**N-Channel**	**P-Channel**	**Unit**
Drain-Source Voltage		V_{DS}	20	- 20	V
Gate-Source Voltage		V_{GS}	12	-12	
Continuous Drain Current (T_J = 150 °C)[a, b]	T_A = 25 °C	I_D	1.2	- 0.5	A
	T_A = 70 °C		0.9	- 0.4	
Pulsed Drain Current		I_{DM}	3.5	- 2	
Maximum Power Dissipation[a, b]	T_A = 25 °C	P_D	1.15		W
	T_A = 70 °C		0.3		
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[a]	t ≤ 10 s	R_{thJA}	130	200	°C/W
Maximum Junction-to-Lead	Steady State	R_{thJL}	85	190	

Notes:
a. Surface Mounted on FR4 board.
b. t ≤ 10 s.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted							
Parameter	**Symbol**	**Test Conditions**		**Min.**	**Typ.**	**Max.**	**Unit**
Static							
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	N-Ch	0.4		1.2	V
		V_{DS} = V_{GS}, I_D = - 250 µA	P-Ch	- 0.4		- 1.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 12 V	N-Ch			± 100	nA
			P-Ch			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V	N-Ch			1	µA
		V_{DS} = - 16 V, V_{GS} = 0 V	P-Ch			- 1	
		V_{DS} = 16V, V_{GS} = 0 V, T_J = 55 °C	N-Ch			10	
		V_{DS} = - 16V, V_{GS} = 0 V, T_J = 55 °C	P-Ch			- 5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	N-Ch	3.5			A
		V_{DS} = - 5 V, V_{GS} = - 10 V	P-Ch	- 2			
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 0.8 A	N-Ch		0.299	0.331	Ω
		V_{GS} = - 4.5 V, I_D = - 0.4 A	P-Ch		0.689	0.760	
		V_{GS} = 2.5 V, I_D = 0.5 A	N-Ch		0.426	0.470	
		V_{GS} = - 2.5 V, I_D = - 0.2 A	P-Ch		0.873	0.997	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 0.8 A	N-Ch		3.1		S
		V_{DS} = - 15 V, I_D = - 0.5 A	P-Ch		2.8		
Diode Forward Voltage[a]	V_{SD}	I_S = 0.8 A, V_{GS} = 0 V	N-Ch		0.8	1.10	V
		I_S = - 0.6 A, V_{GS} = 0 V	P-Ch		- 0.75	- 1.2	
Dynamic[b]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 0.5 A P-Channel V_{DS} = - 10 V, V_{GS} = - 4.5 V, I_D = - 0.3 A	N-Ch		1.6	2.2	nC
			P-Ch		2.1	2.6	
Gate-Source Charge	Q_{gs}		N-Ch		0.1		
			P-Ch		0.4		
Gate-Drain Charge	Q_{gd}		N-Ch		0.2		
			P-Ch		0.5		
Gate Resistance	R_g		N-Ch	2.5		3.9	Ω
			P-Ch	3		4.5	
Turn-On Delay Time	$t_{d(on)}$	N-Channel V_{DD} = 15 V, R_L = 15 Ω $I_D \cong$ 0.5 A, V_{GEN} = 10 V, R_g = 6 Ω P-Channel V_{DD} = - 15 V, R_L = 15 Ω $I_D \cong$ - 0.5 A, V_{GEN} = - 10 V, R_g = 6 Ω	N-Ch		9		ns
			P-Ch		8		
Rise Time	t_r		N-Ch		19		
			P-Ch		5.6		
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		23		
			P-Ch		12		
Fall Time	t_f		N-Ch		7		
			P-Ch		6.9		
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 0.6 A, dI/dt = 100 A/µs	N-Ch		6.3		
		I_F = - 0.6 A, dI/dt = 100 A/µs	P-Ch		11		

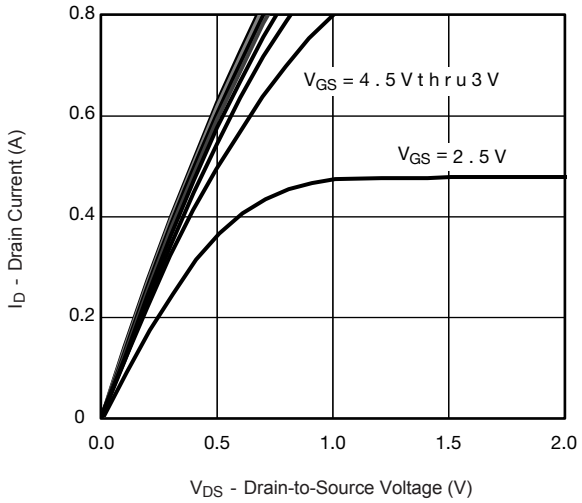
Notes:

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

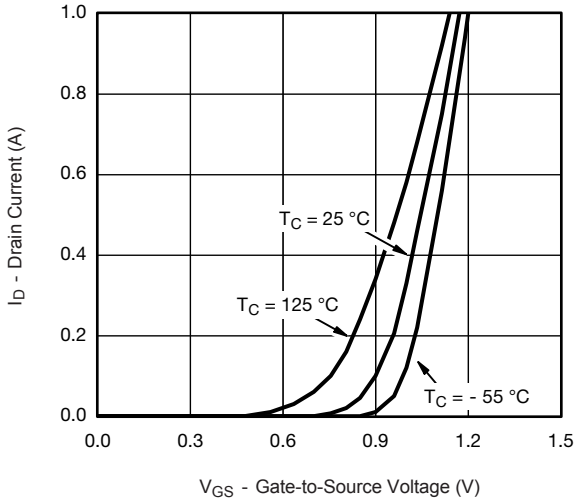
b. Guaranteed by design, not subject to production testing.

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.

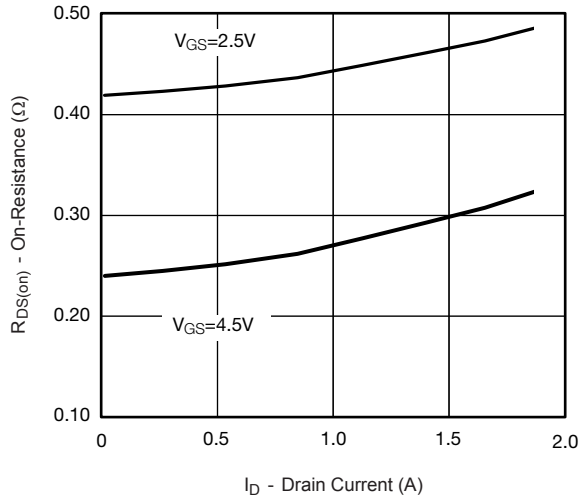
N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



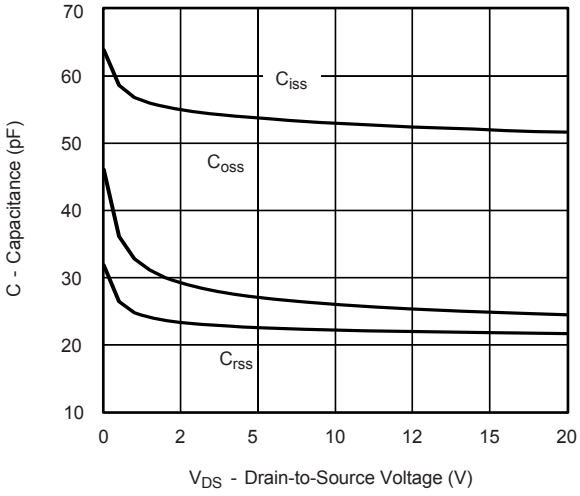
Output Characteristics



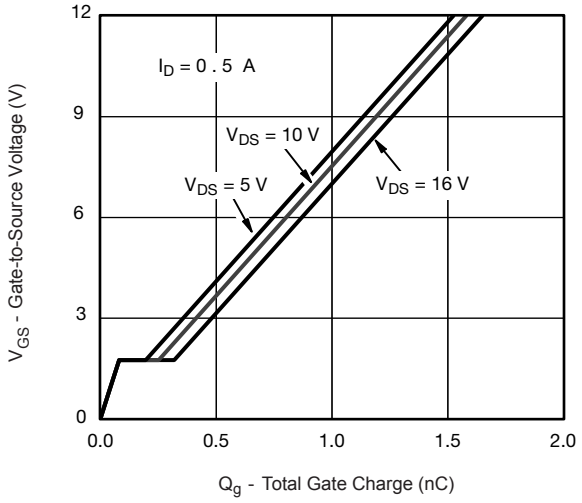
Transfer Characteristics



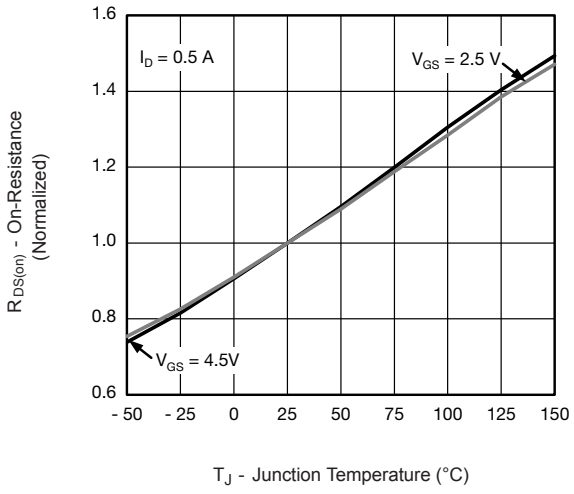
On-Resistance vs. Drain Current



Capacitance

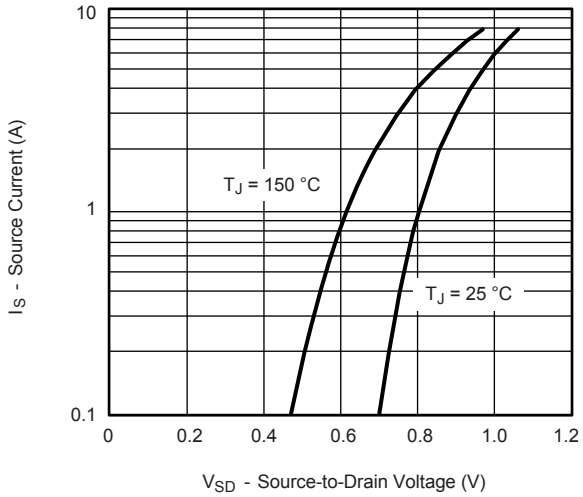


Gate Charge

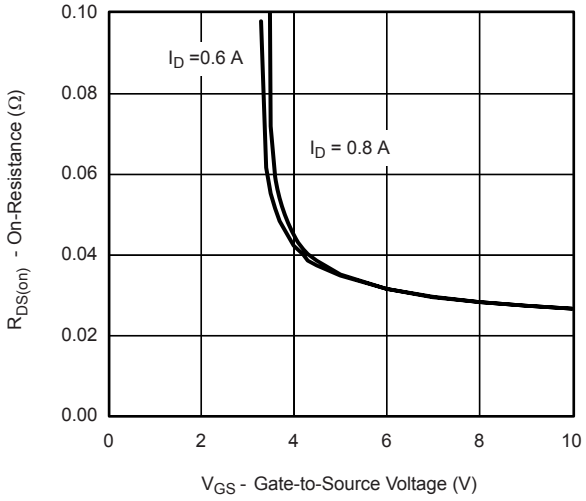


On-Resistance vs. Junction Temperature

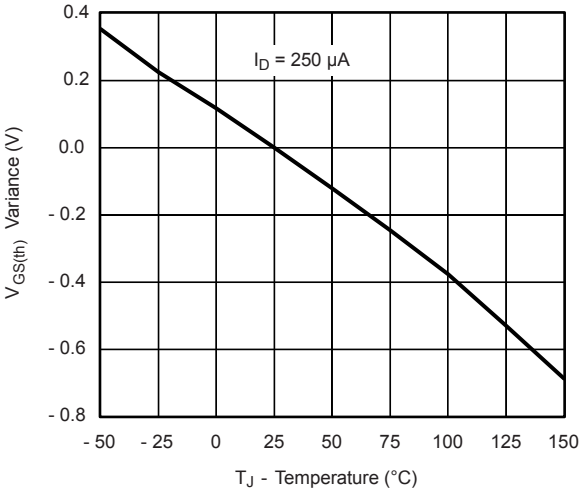
N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



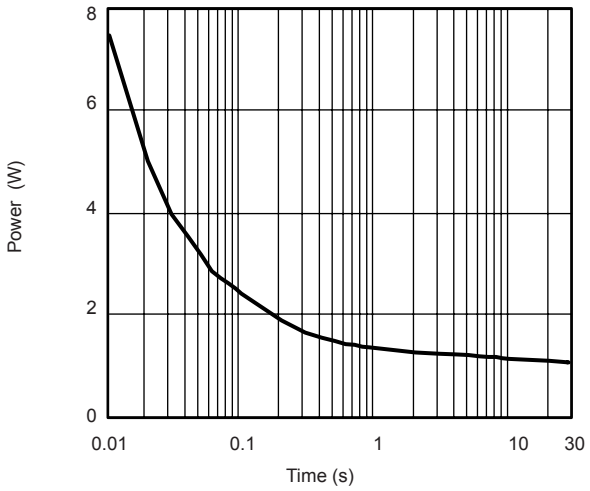
Source-Drain Diode Forward Voltage



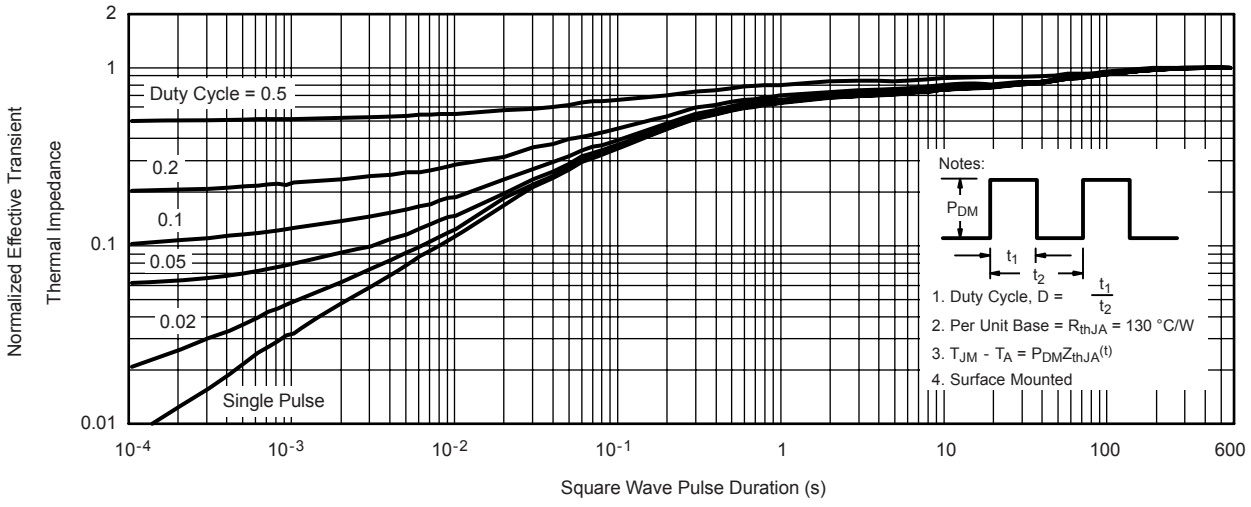
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

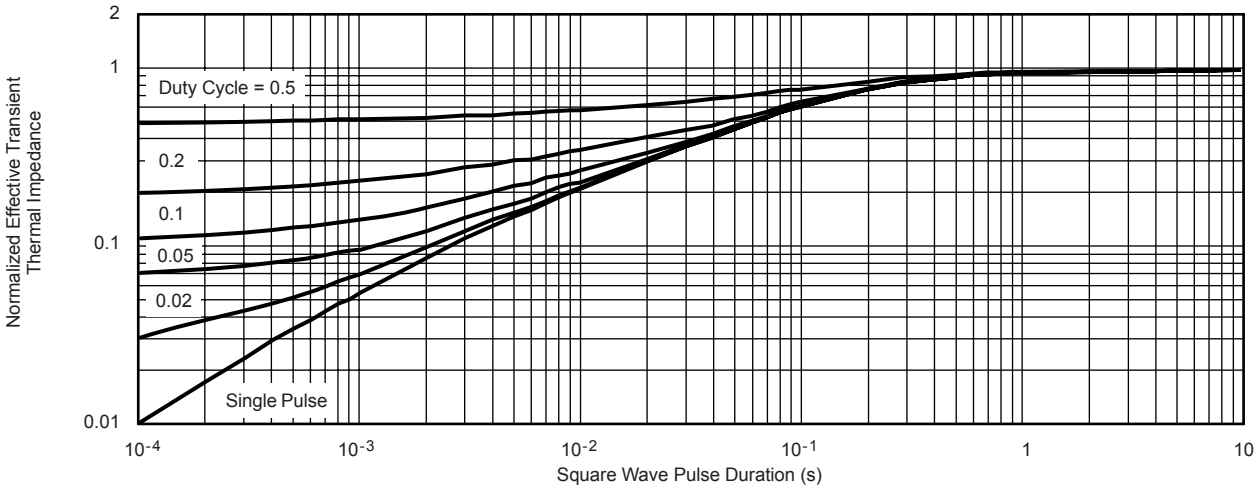


Single Pulse Power (Junction-to-Ambient)



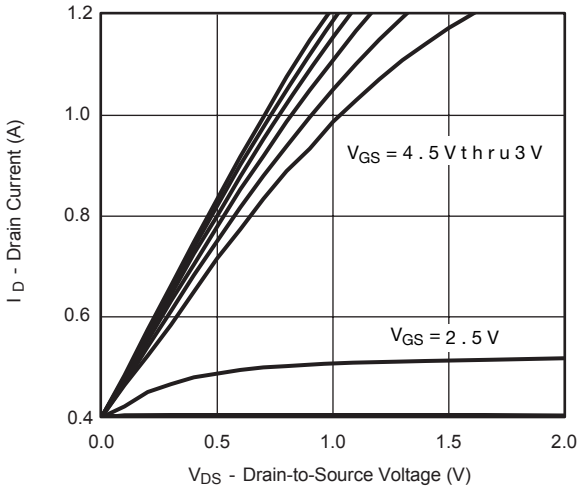
Normalized Thermal Transient Impedance, Junction-to-Ambient

N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

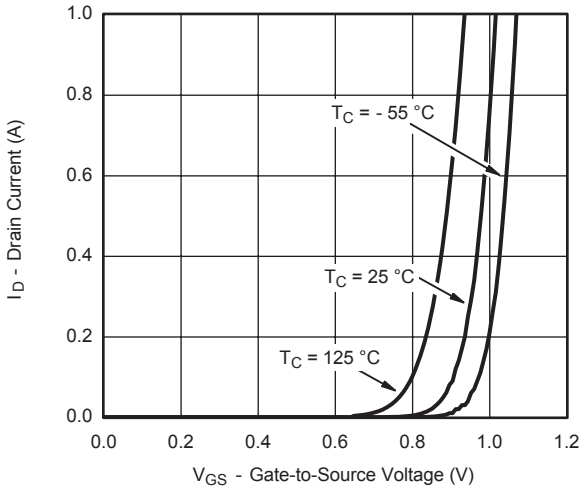


Normalized Thermal Transient Impedance, Junction-to-Foot

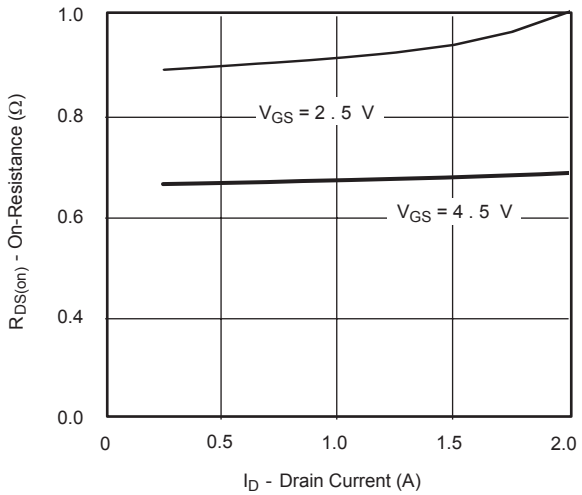
P-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



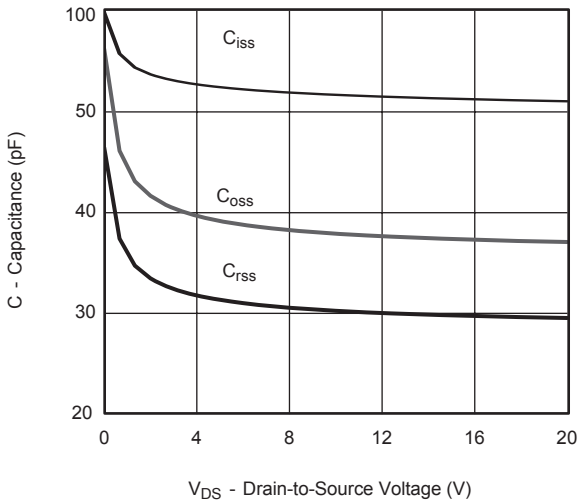
Output Characteristics



Transfer Characteristics

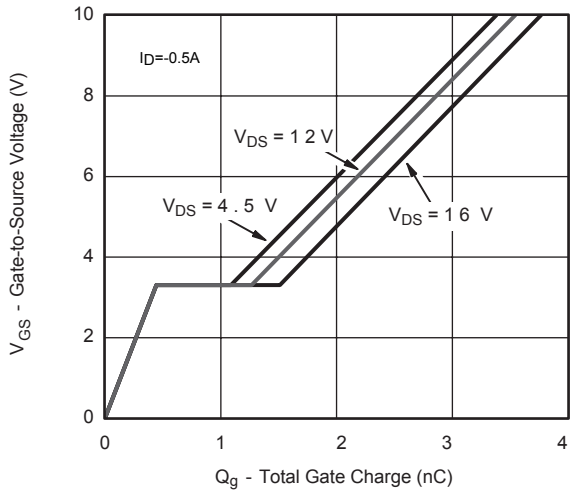


On-Resistance vs. Drain Current

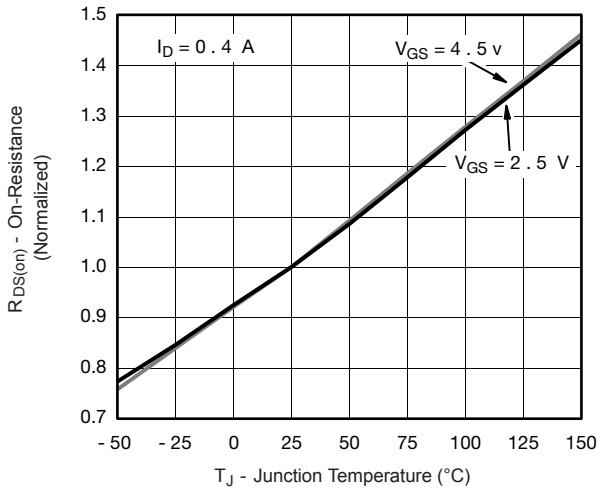


Capacitance

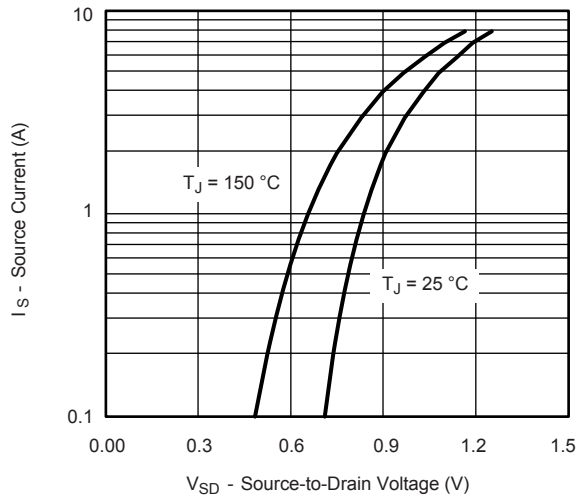
P-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



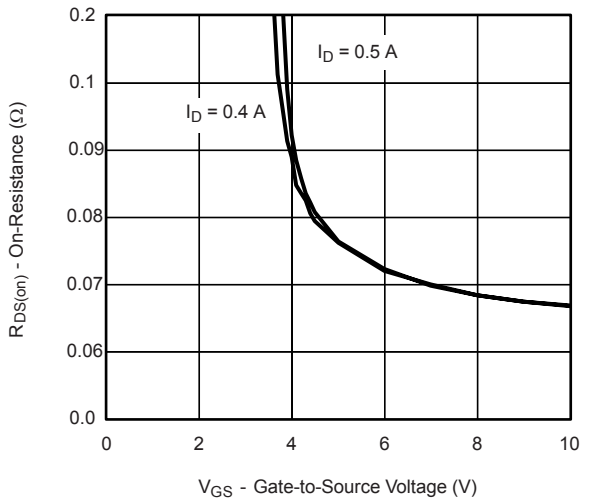
Gate Charge



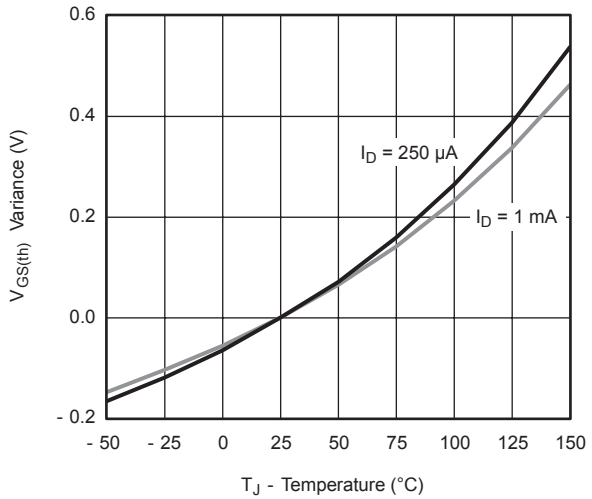
On-Resistance vs. Junction Temperature



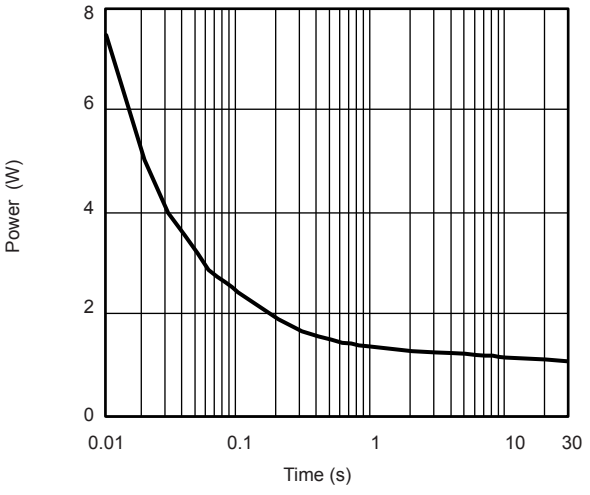
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

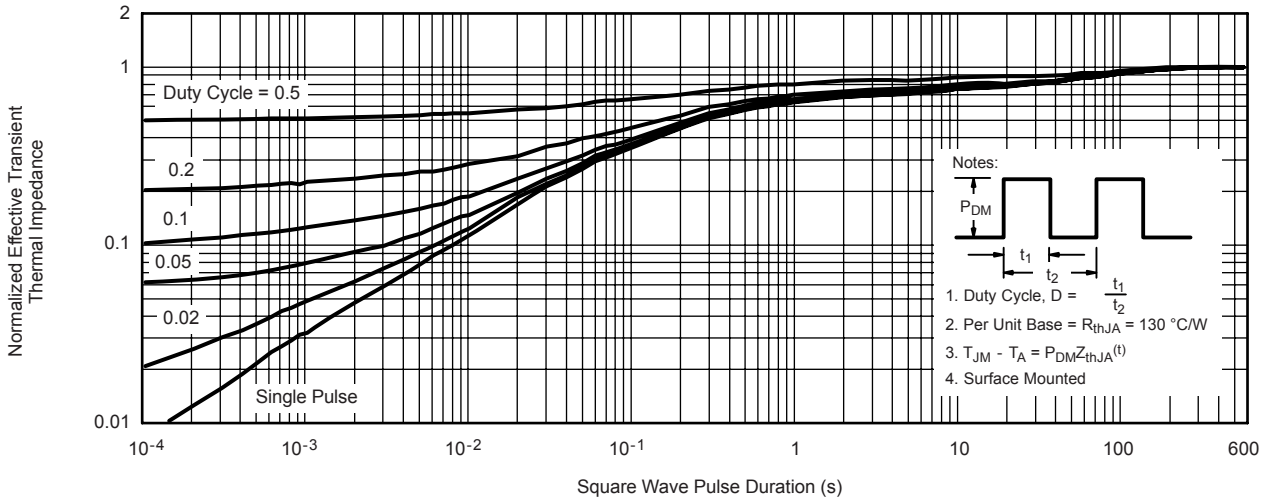


Threshold Voltage

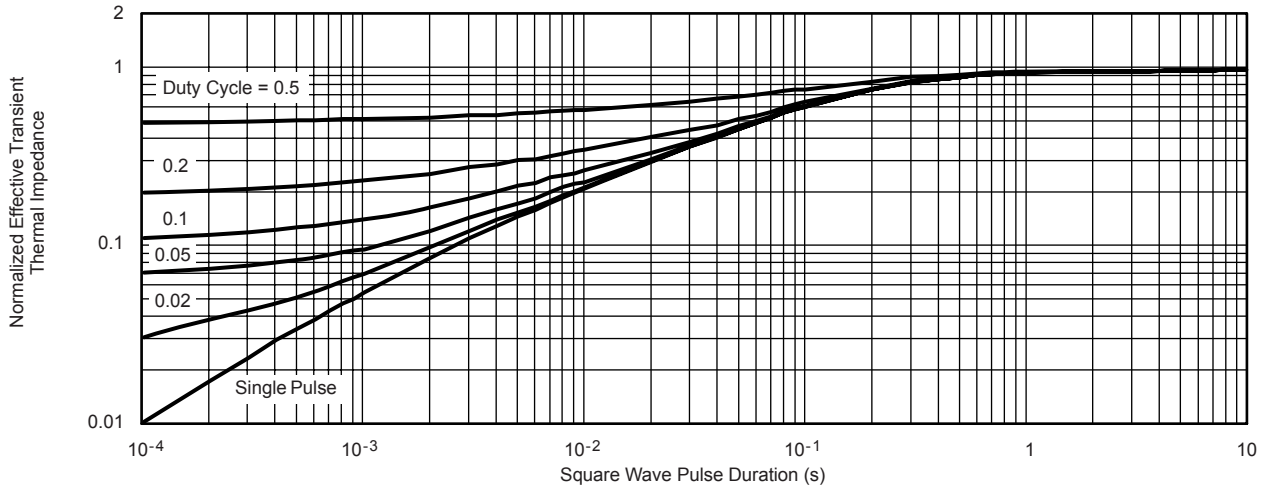


Single Pulse Power (Junction-to-Ambient)

P-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

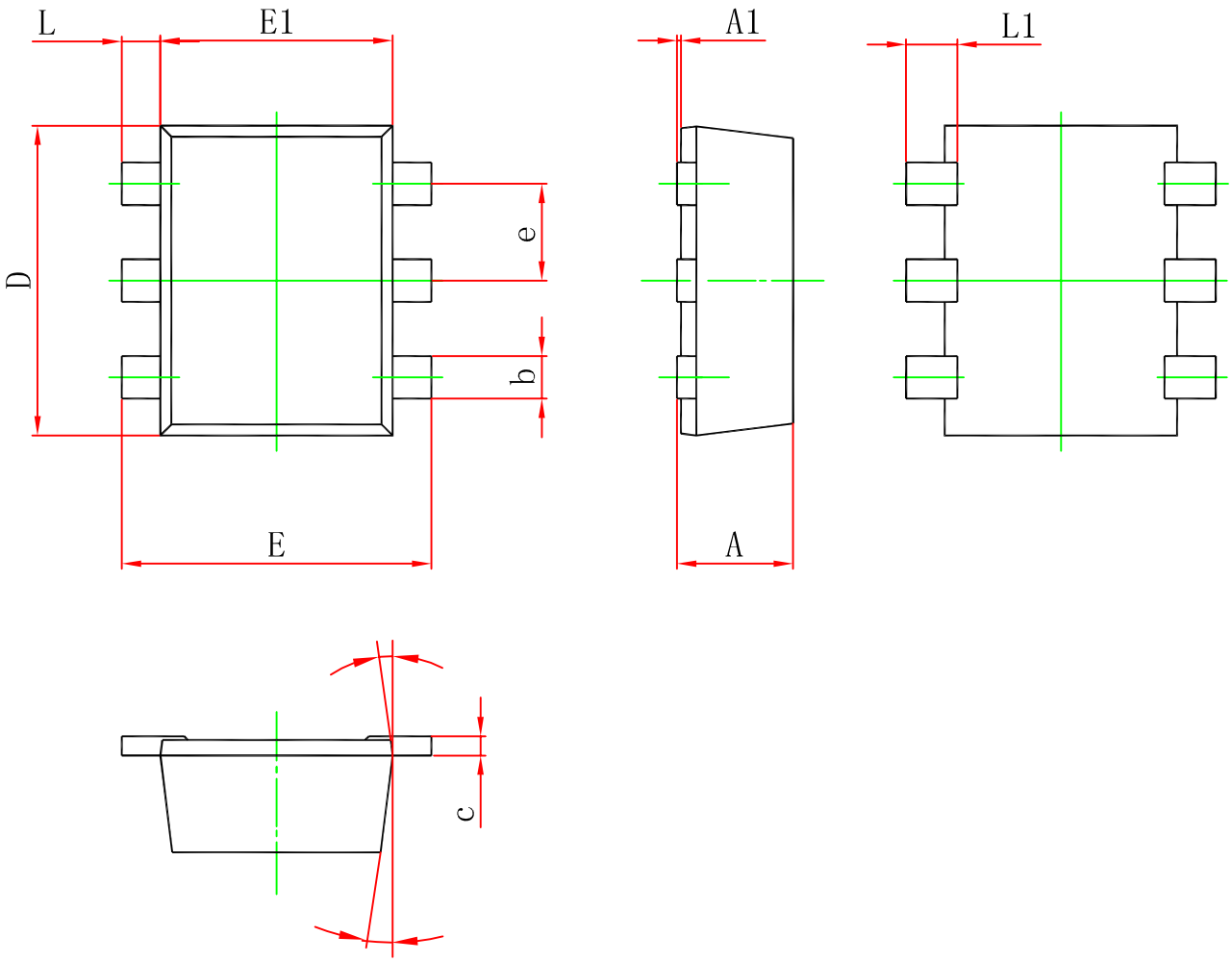


Normalized Thermal Transient Impedance, Junction-to-Ambient



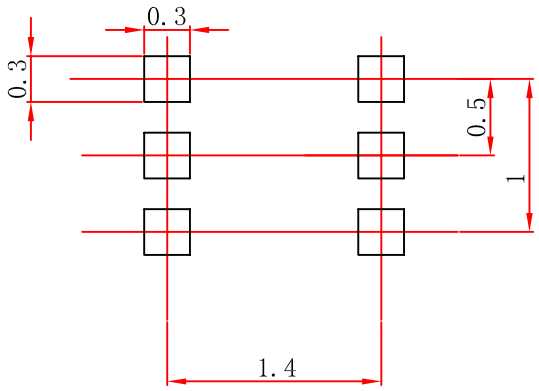
Normalized Thermal Transient Impedance, Junction-to-Foot

SOT-563 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	0.525	0.600	0.021	0.024
A1	0.000	0.050	0.000	0.002
e	0.450	0.550	0.018	0.022
c	0.090	0.160	0.004	0.006
D	1.500	1.700	0.059	0.067
b	0.170	0.270	0.007	0.011
E1	1.100	1.300	0.043	0.051
E	1.500	1.700	0.059	0.067
L	0.100	0.300	0.004	0.012
L1	0.200	0.400	0.008	0.016
θ	7 °REF.		7 °REF.	

RECOMMENDED MINIMUM PADS FOR SOT-563



1.Unit: mm

2.Package size: 1.6*1.2

3.Tolerance: ±0.05

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