Dual N-Channel 150-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
150	0.105 @ V_{GS} = 10 V	4.1
	0.115 @ V_{GS} = 6 V	3.9

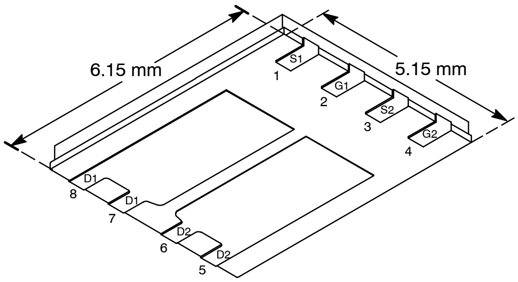
FEATURES

- TrenchFET® Power MOSFET
- Low On-Resistance in New Low Thermal Resistance PowerPAK® Package
- Dual MOSFET for Space Savings
- 100% R_g Tested

APPLICATIONS

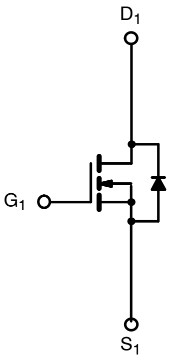
- High Efficiency Primary Side Switches
- Half Bridge and Forward Converters

PowerPAK SO-8

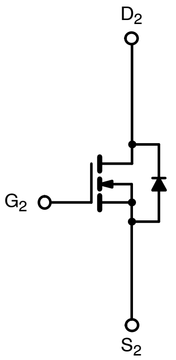


Bottom View

Ordering Information: Si7956DP-T1—E3



N-Channel MOSFET



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	150		V
Gate-Source Voltage		V_{GS}	±20		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	4.1	2.6	A
	T_A = 70°C		3.3	2.1	
Pulsed Drain Current		I_{DM}	20		
Continuous Source Current (Diode Conduction)[a]		I_S	2.9	1.2	
Single Avalanche Current	L = 0.1 mH	I_{AS}	15		
Single Avalanche Energy		E_{AS}	11		mJ
Maximum Power Dissipation[a]	T_A = 25°C	P_D	3.5	1.4	W
	T_A = 70°C		2.2	0.9	
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 sec	R_{thJA}	26	35	°C/W
	Steady State		60	85	
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	2.2	2.7	

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

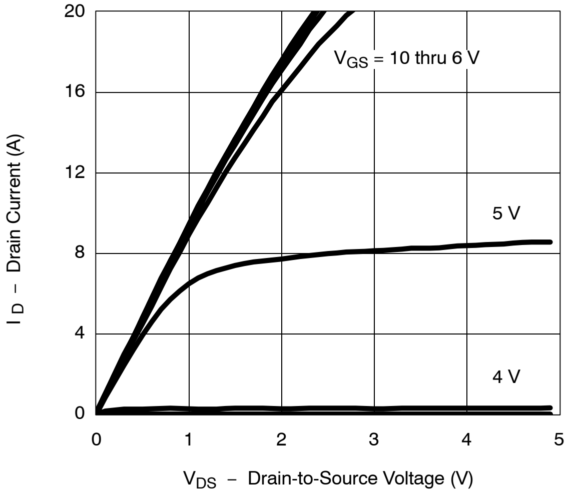
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu A$	2	3.1	4.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 20$ V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 150$ V, $V_{GS} = 0$ V			1	µA
		$V_{DS} = 150$ V, $V_{GS} = 0$ V, $T_J = 55°C$			5	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq 5$ V, $V_{GS} = 10$ V	20			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 4.1$ A		0.088	0.105	Ω
		$V_{GS} = 6$ V, $I_D = 3.9$ A		0.096	0.115	
Forward Transconductance[a]	g_{fs}	$V_{DS} = 15$ V, $I_D = 4.1$ A		10		S
Diode Forward Voltage[a]	V_{SD}	$I_S = 2.9$ A, $V_{GS} = 0$ V		0.77	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	$V_{DS} =75$ V, $V_{GS} = 10$ V, $I_D = 4.1$ A		17	26	nC
Gate-Source Charge	Q_{gs}			3.9		
Gate-Drain Charge	Q_{gd}			5.5		
Gate Resostamce	R_g		1	2	3	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 75$ V, $R_L = 75\ \Omega$ $I_D \cong 1$ A, $V_{GEN} = 10$ V, $R_G = 6\ \Omega$		14	22	ns
Rise Time	t_r			13	22	
Turn-Off Delay Time	$t_{d(off)}$			36	58	
Fall Time	t_f			18	30	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.9$ A, di/dt = 100 A/µs		50	75	

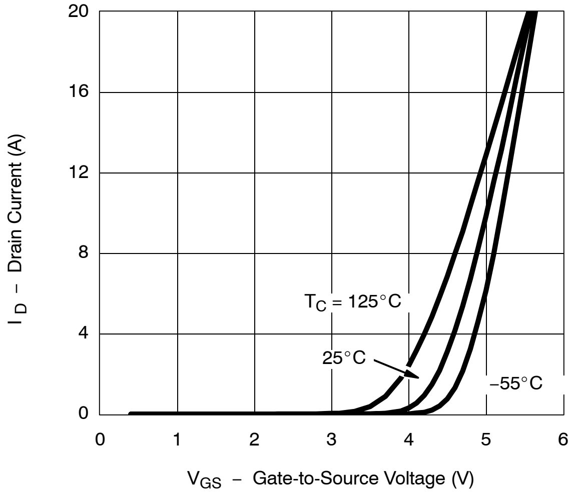
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

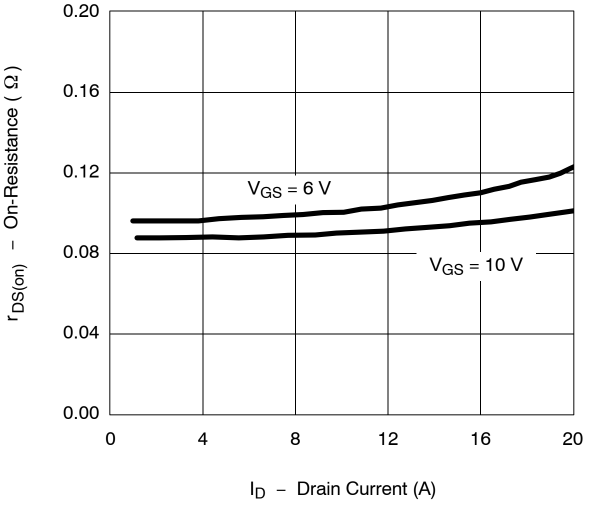
Output Characteristics

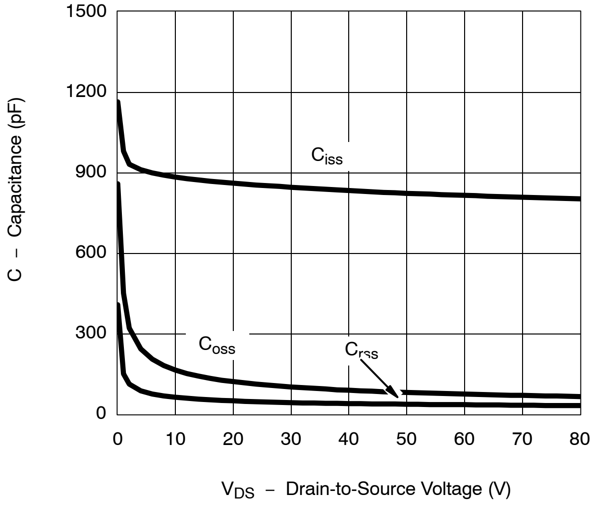


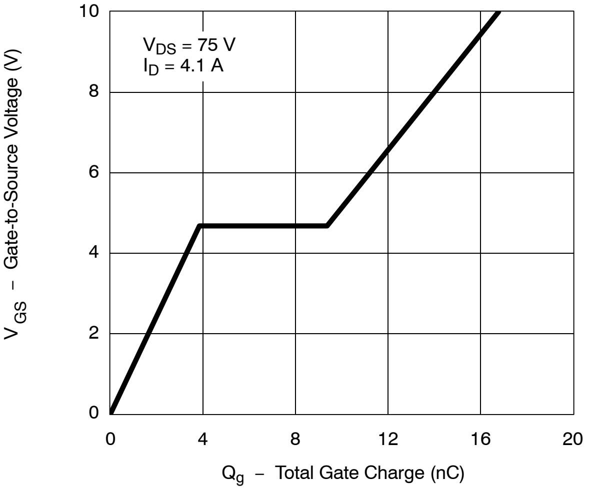
Transfer Characteristics

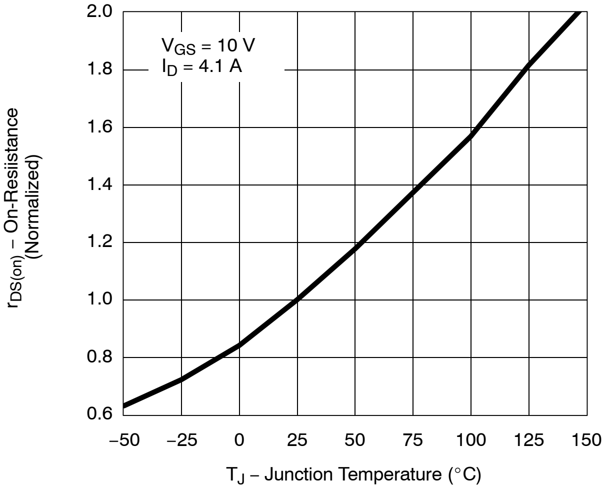


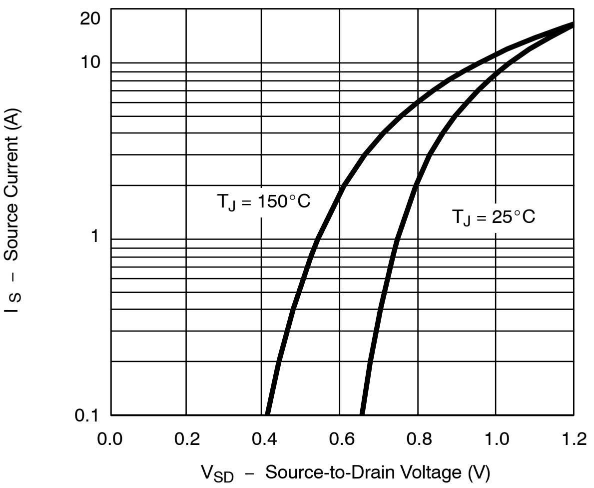
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

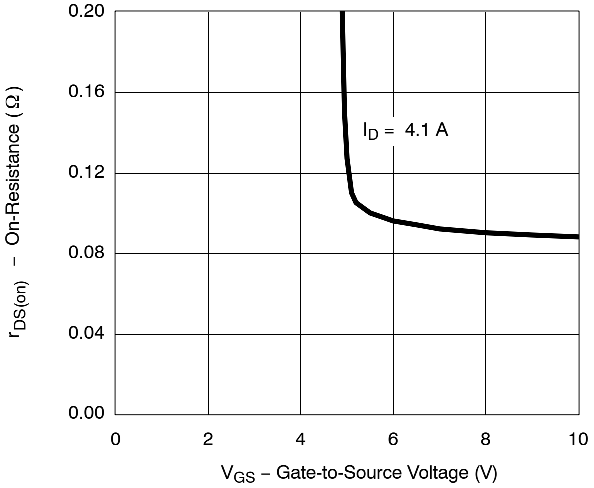

On-Resistance vs. Drain Current


Capacitance


Gate Charge

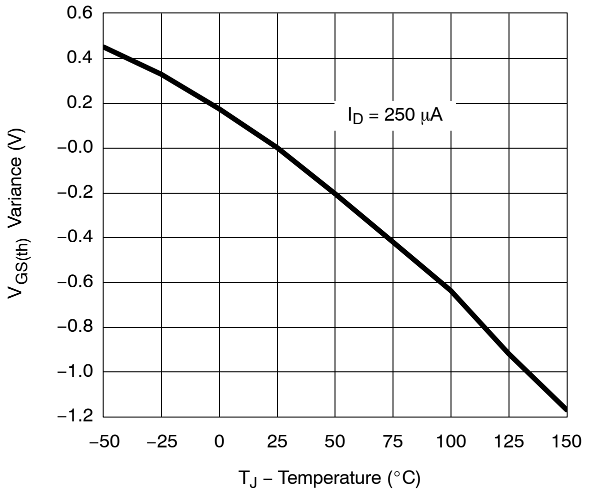

On-Resistance vs. Junction Temperature


Source-Drain Diode Forward Voltage

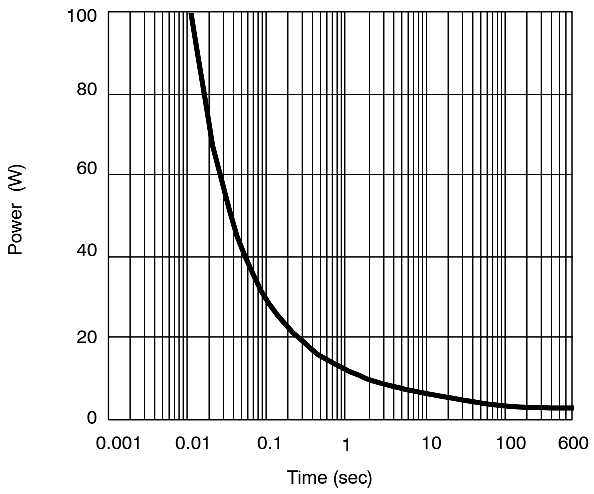

On-Resistance vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

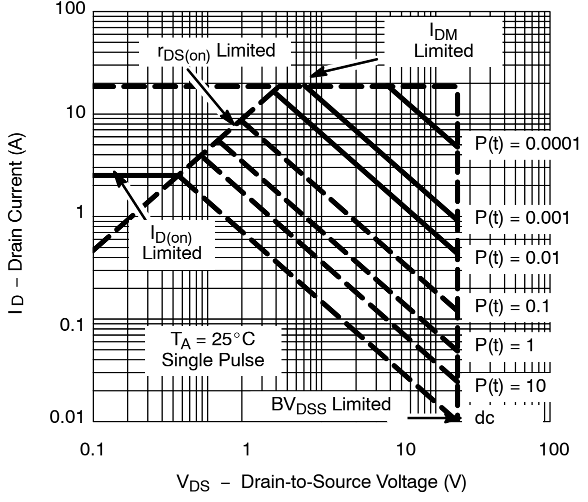
Threshold Voltage



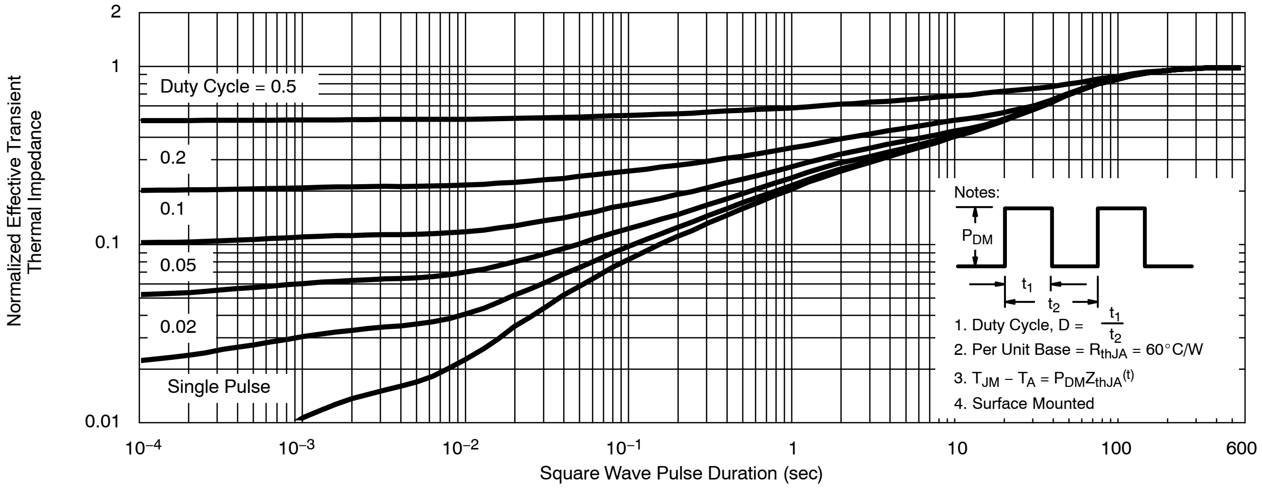
Single Pulse Power



Safe Operating Area, Junction-To-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

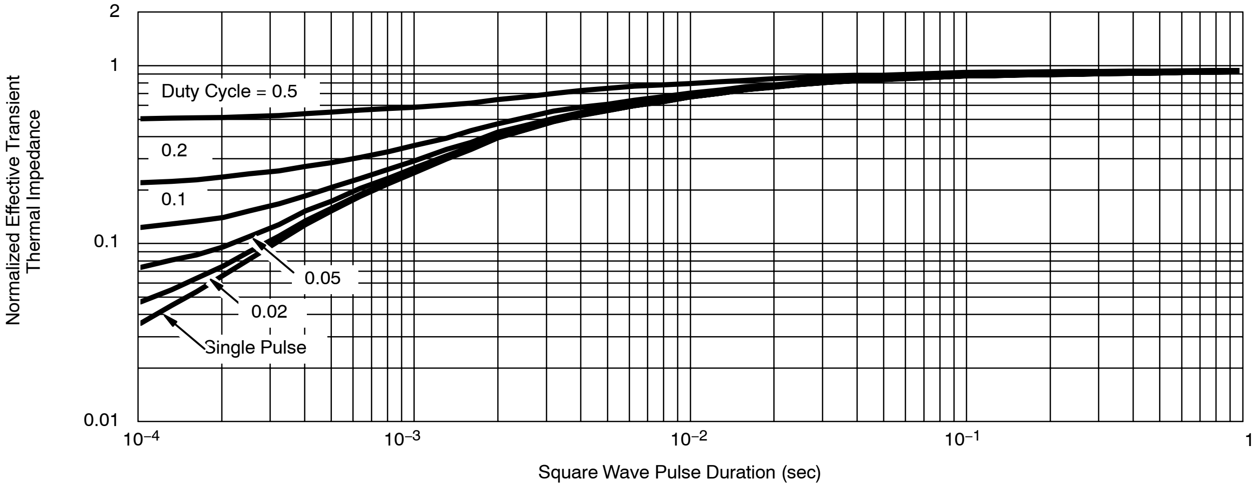


Notes:

1. Duty Cycle, D = $\frac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 60°C/W
3. $T_{JM} - T_A = P_{DM}Z_{thJA}^{(t)}$
4. Surface Mounted

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Normalized Thermal Transient Impedance, Junction-to-Case



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