

## P-Channel 12-V (D-S) MOSFET

### PRODUCT SUMMARY

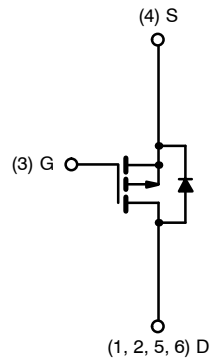
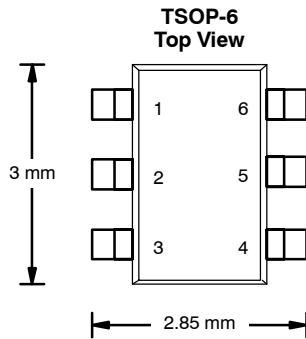
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-12	0.040 @ $V_{GS} = -4.5$ V	-6.0
	0.053 @ $V_{GS} = -2.5$ V	-5.2
	0.072 @ $V_{GS} = -1.8$ V	-4.5

### FEATURES

- TrenchFET® Power MOSFET: 1.8-V Rated
- Ultra Low On-Resistance

### APPLICATIONS

- Load Switch
- PA Switch



Ordering Information: Si3447BDV-T1  
Si3447BDV-T1—E3 (Lead Free)

Marking Code: B7xxx

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	5 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	-12		V	
Gate-Source Voltage	$V_{GS}$	$\pm 8$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-6.0	-4.5	A
		$T_A = 85^\circ\text{C}$	-4.3	-3.3	
Pulsed Drain Current	$I_{DM}$	-20			
Continuous Diode Current (Diode Conduction) <sup>a</sup>	$I_S$	-1.7	-0.9		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	2.0	1.1	W
		$T_A = 85^\circ\text{C}$	1.0	0.6	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 5$ sec	50	62.5	$^\circ\text{C/W}$
		Steady State	90	110	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	30	36		

#### Notes

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

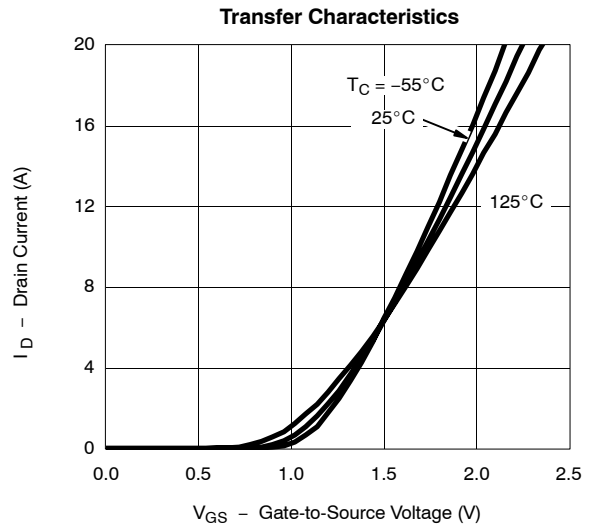
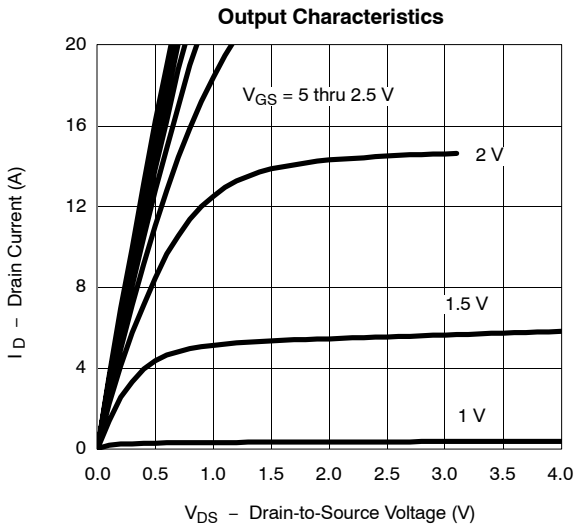


<b>SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)</b>						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-0.45		1	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C			-5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -4.5 V	-20			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -6.0 A		0.033	0.040	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -5.2 A		0.044	0.053	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -2.0 A		0.060	0.072	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -6.0 A		15		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -1.7 A, V <sub>GS</sub> = 0 V		-0.7	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -6 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -6.0 A		9.3	14	nC
Gate-Source Charge	Q <sub>gs</sub>			1.5		
Gate-Drain Charge	Q <sub>gd</sub>			2.6		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -6 V, R <sub>L</sub> = 6 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>g</sub> = 6 Ω		20	30	ns
Rise Time	t <sub>r</sub>			46	70	
Turn-Off Delay Time	t <sub>d(off)</sub>			62	95	
Fall Time	t <sub>f</sub>			62	95	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -1.7 A, di/dt = 100 A/μs		40	

**Notes**

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

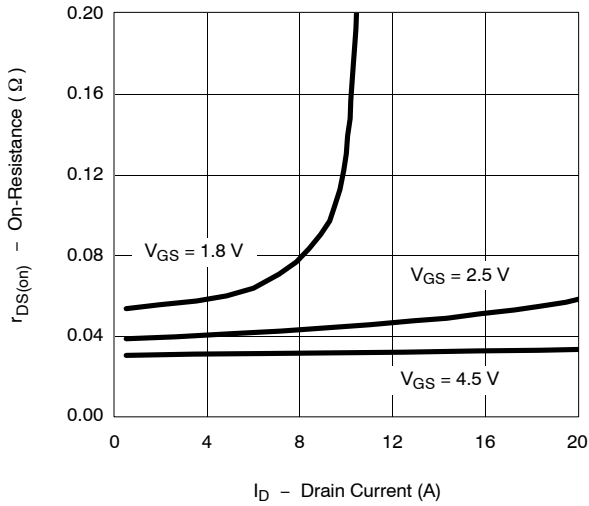
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



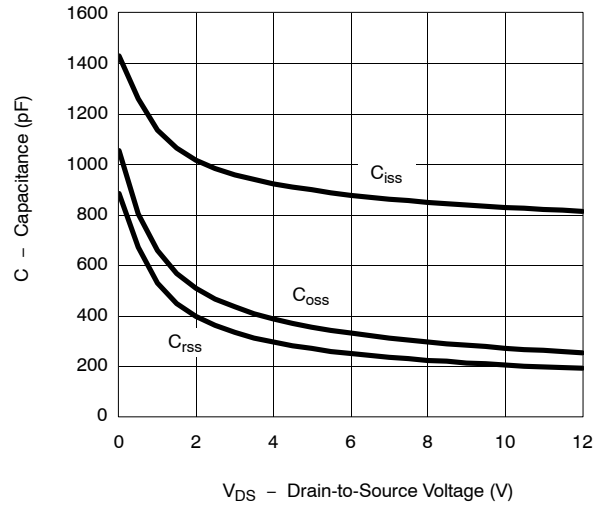


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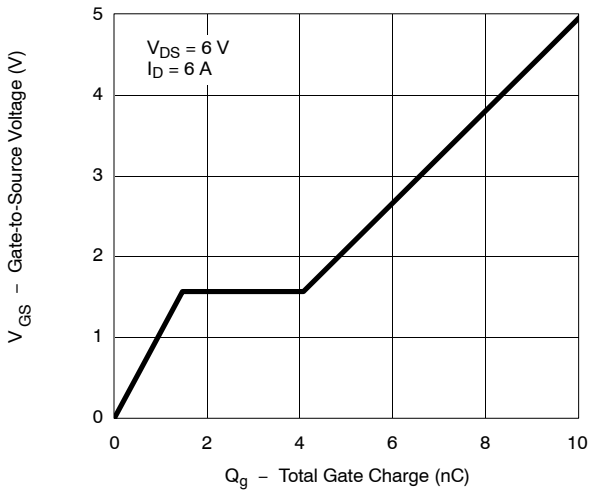
**On-Resistance vs. Drain Current**



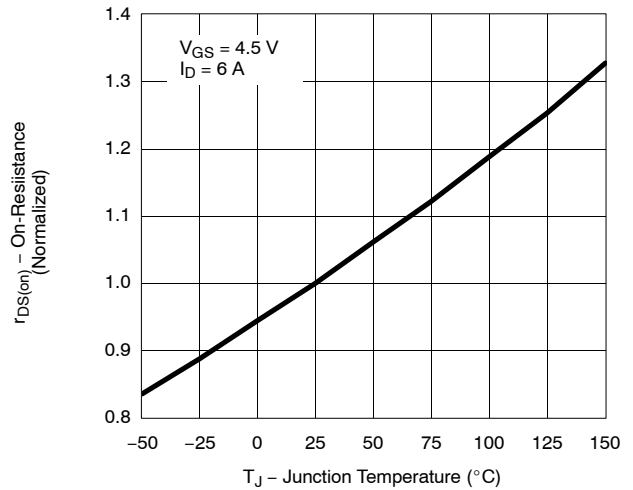
**Capacitance**



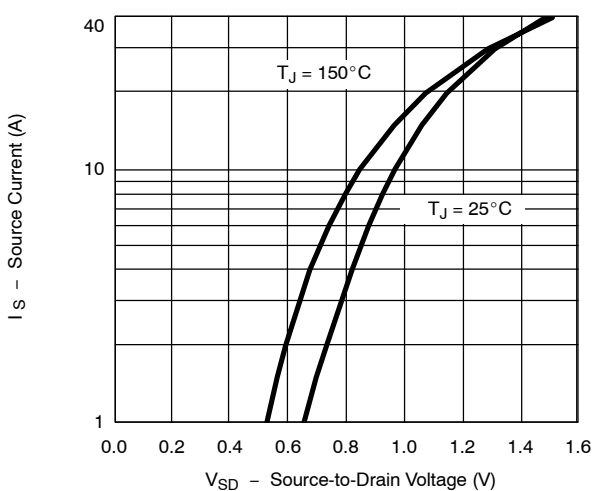
**Gate Charge**



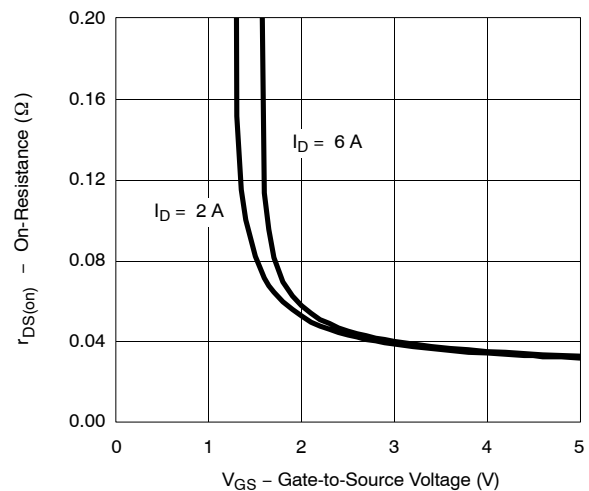
**On-Resistance vs. Junction Temperature**



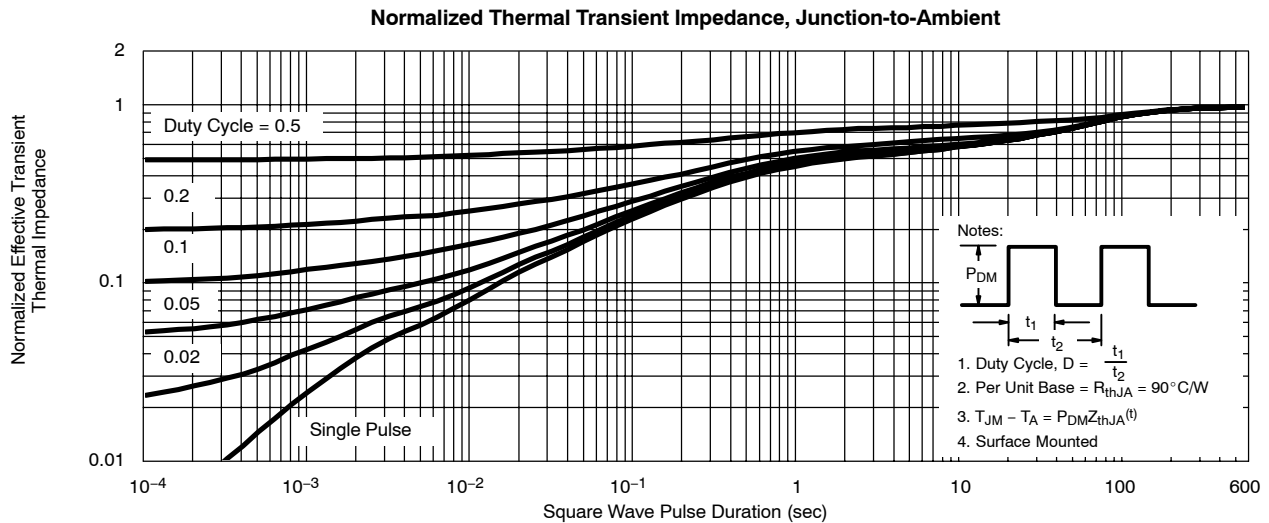
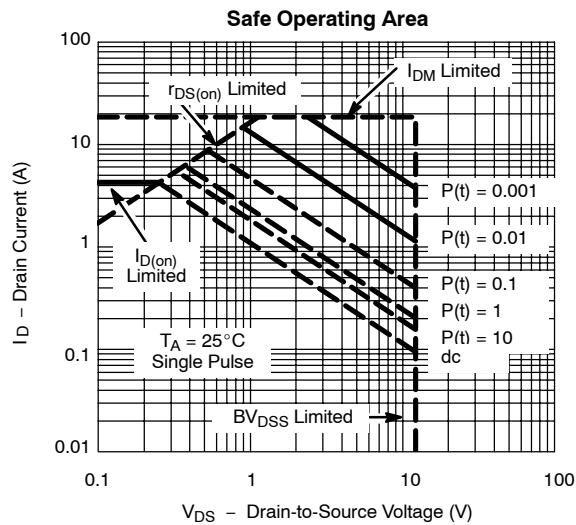
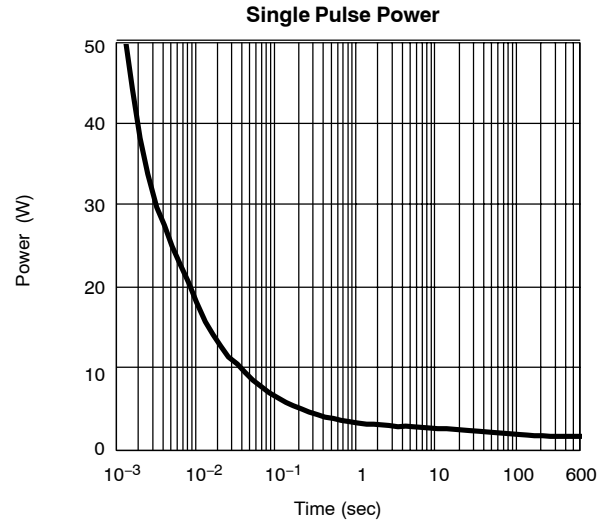
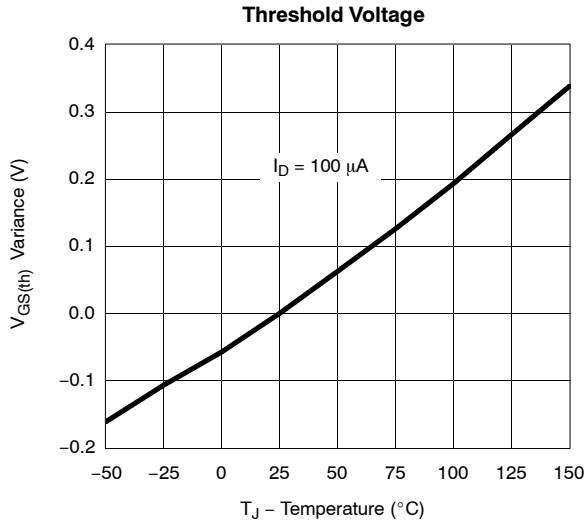
**Source-Drain Diode Forward Voltage**



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

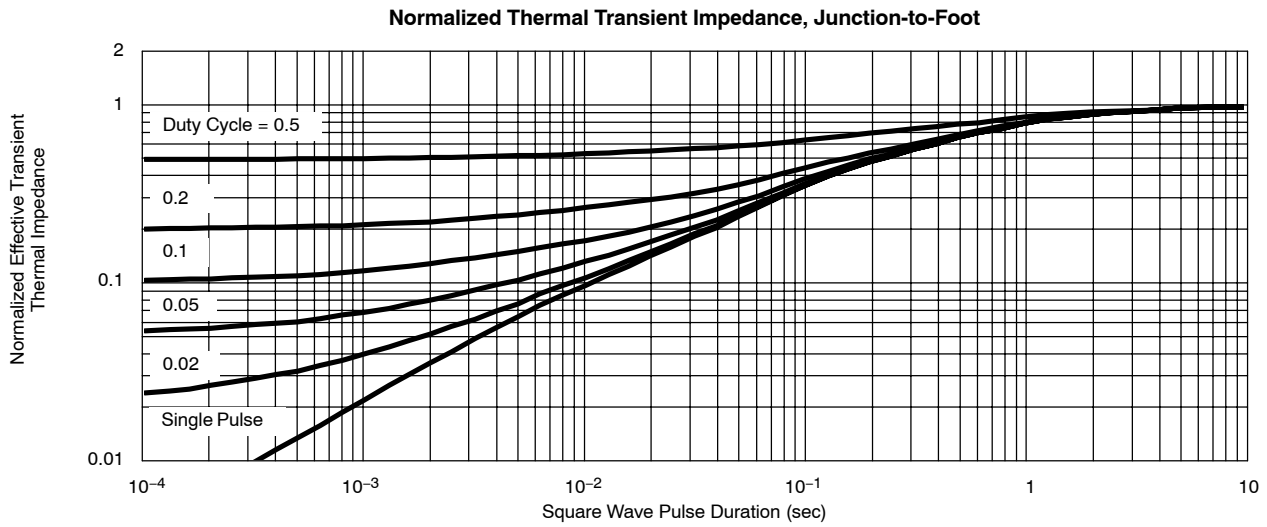


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