



## N-Channel 30-V (D-S) MOSFET

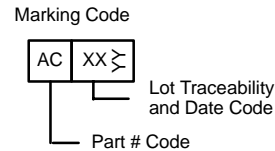
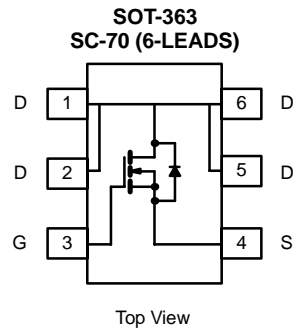
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.075 @ $V_{GS} = 10$ V	3.6
	0.115 @ $V_{GS} = 4.5$ V	2.9

### FEATURES

- TrenchFET® Power MOSFET
- Thermally Enhanced SC-70 Package
- PWM Optimized

### APPLICATIONS

- Boost Converter in Portable Devices
  - Low Gate Charge (3 nC)
- Low Current Synchronous Rectifier



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	3.6	2.8	A
		$T_A = 85^\circ\text{C}$	2.6	2.1	
Pulsed Drain Current	$I_{DM}$	10			
Continuous Diode Current (Diode Conduction) <sup>a</sup>	$I_S$	1.3	0.8		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.6	1.0	W
		$T_A = 85^\circ\text{C}$	0.8	0.5	
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	60	80	$^\circ\text{C/W}$
		Steady State	100	125	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	34	45		

Notes

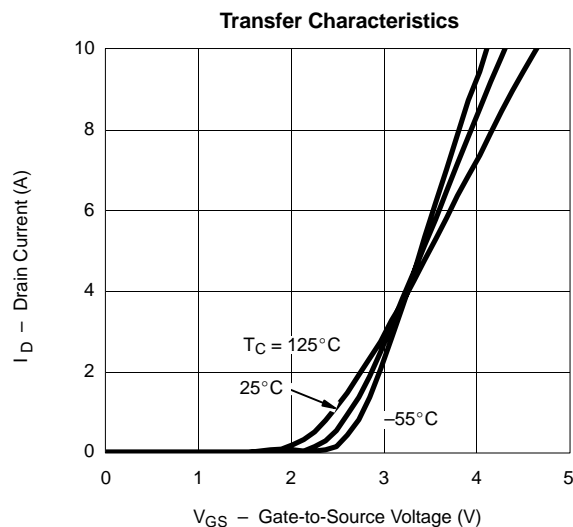
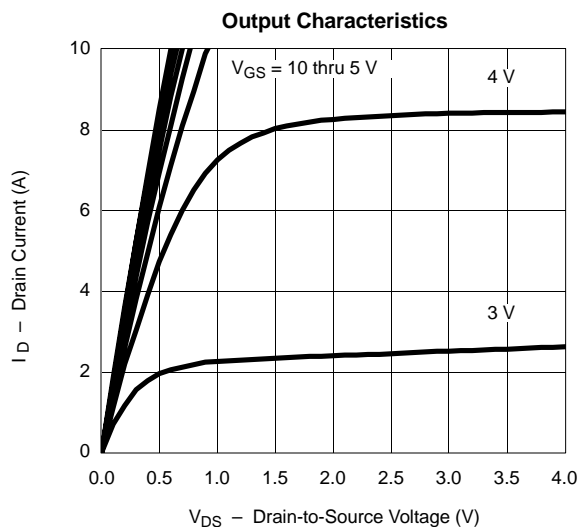
a. Surface Mounted on 1" x 1" FR4 Board.


**SPECIFICATIONS ( $T_J = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	0.80		2.5	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$			5	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$	10			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 3.6 \text{ A}$		0.061	0.075	$\Omega$
		$V_{GS} = 4.5 \text{ V}, I_D = 2.0 \text{ A}$		0.092	0.115	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 10 \text{ V}, I_D = 3.6 \text{ A}$		5		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 1.3 \text{ A}, V_{GS} = 0 \text{ V}$		0.78	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 3.6 \text{ A}$		1.9	3	nC
Gate-Source Charge	$Q_{gs}$			0.75		
Gate-Drain Charge	$Q_{gd}$			0.75		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15 \text{ V}, R_L = 15 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}, R_G = 6 \Omega$		10	15	ns
Rise Time	$t_r$			12	18	
Turn-Off Delay Time	$t_{d(off)}$			15	22	
Fall Time	$t_f$			9	15	
Source-Drain Reverse Recovery	$t_{rr}$		$I_F = 1.4 \text{ A}, di/dt = 100/\mu\text{s}$		40	

## Notes

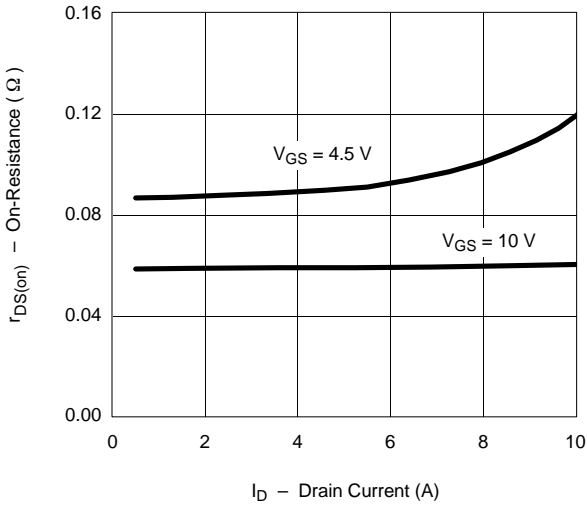
- a. Pulse test; pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .  
 b. Guaranteed by design, not subject to production testing.

**TYPICAL CHARACTERISTICS ( $25^\circ\text{C}$  UNLESS NOTED)**


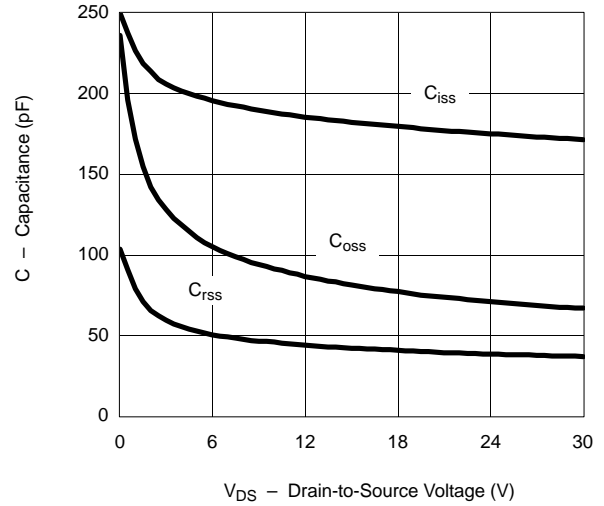


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

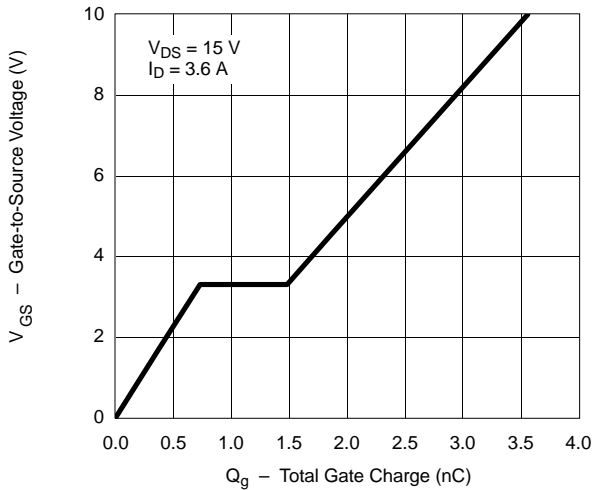
**On-Resistance vs. Drain Current**



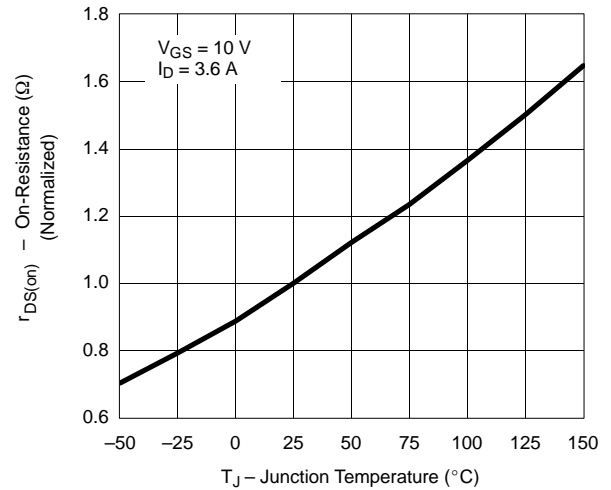
**Capacitance**



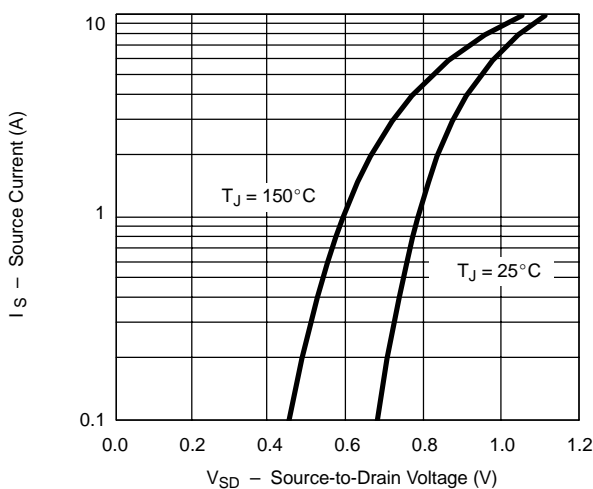
**Gate Charge**



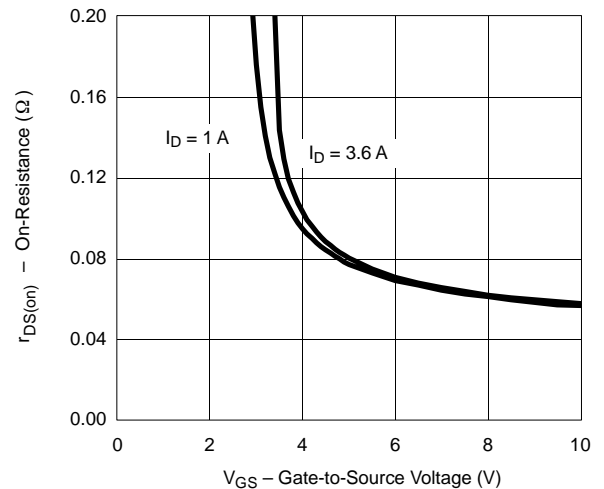
**On-Resistance vs. Junction Temperature**



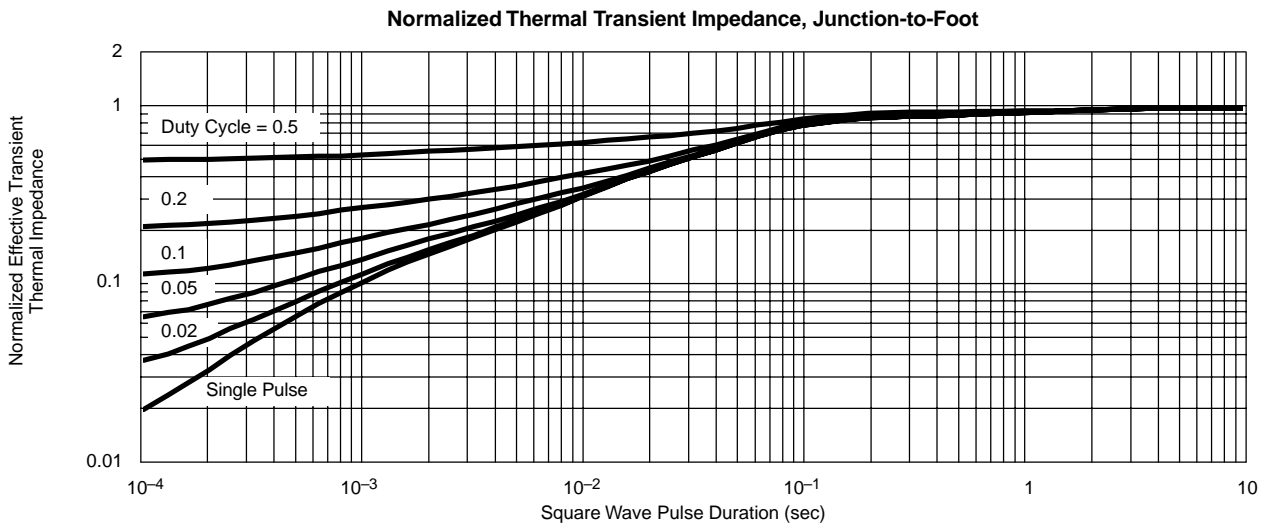
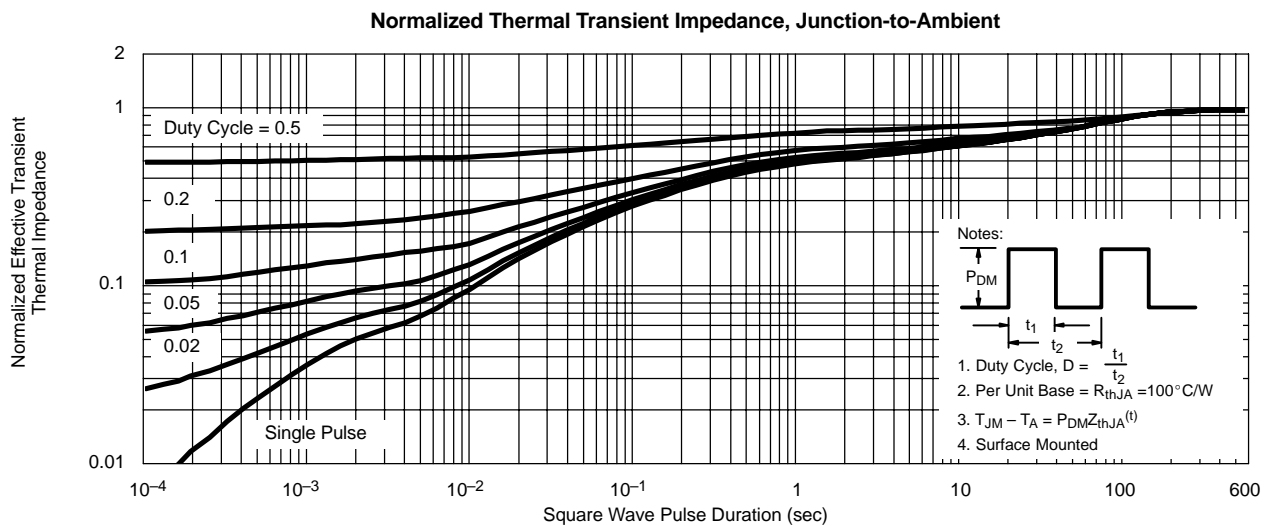
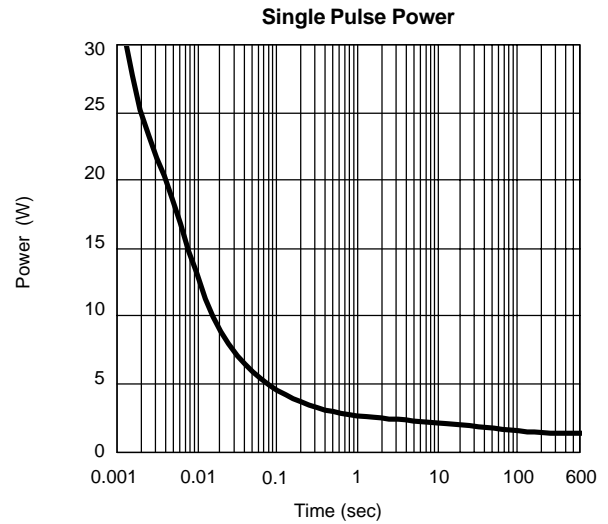
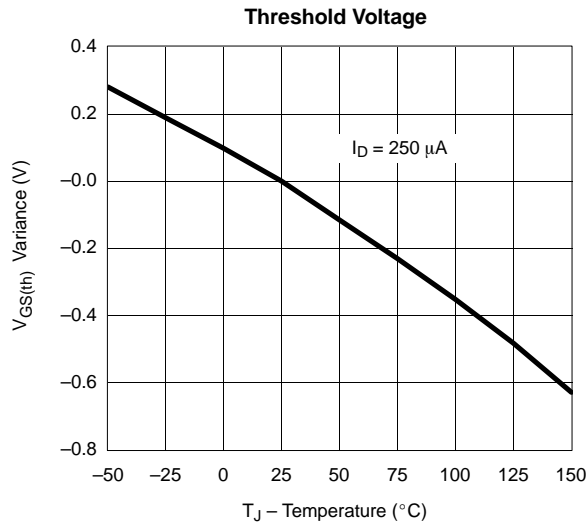
**Source-Drain Diode Forward Voltage**



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



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





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