



## N-Channel 60-V (D-S) MOSFET

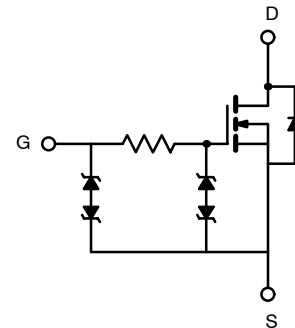
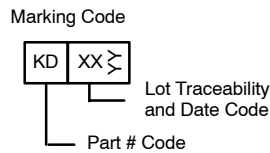
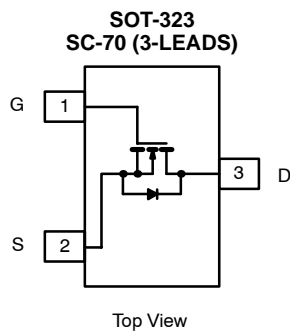
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
60	2.5 @ $V_{GS} = 10$ V	0.25
	3 @ $V_{GS} = 4.5$ V	0.23
	8 @ $V_{GS} = 3$ V	0.05

### FEATURES

- TrenchFET® Power MOSFET
- ESD Protected: 2000 V

### APPLICATIONS

- P-Channel Driver
  - Notebook PC
  - Servers



Ordering Information: Si1330EDL-T1

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 secs	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	60		V
Gate-Source Voltage		$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	0.25	0.24	A
	$T_A = 70^\circ\text{C}$		0.2	0.19	
Pulsed Drain Current		$I_{DM}$	1.0		
Continuous Diode Current (Diode Conduction) <sup>a</sup>		$I_S$	0.26	0.23	
Maximum Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	$P_D$	0.31	0.28	W
	$T_A = 70^\circ\text{C}$		0.20	0.18	
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>	$t \leq 5$ sec	$R_{thJA}$	355	400	$^\circ\text{C}/\text{W}$
	Steady State		380	450	
Maximum Junction-to-Foot (Drain)		$R_{thJF}$	285	340	

Notes

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

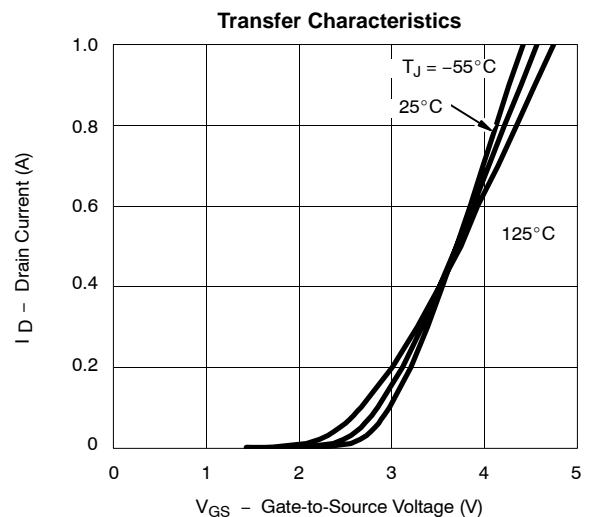
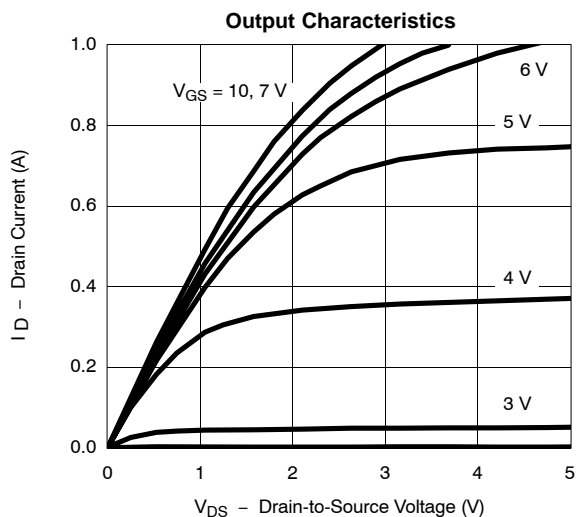


SPECIFICATIONS <sup>a</sup> (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 10 μA	60			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1	2.0	2.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 10 V			± 1	μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V			1	
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			10	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 7.5 V	0.5			A
		V <sub>GS</sub> = 4.5 V, V <sub>DS</sub> = 10 V	0.4			
		V <sub>GS</sub> = 3 V, V <sub>DS</sub> = 10 V	0.05			
Drain-Source On-Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.25 A		1.0	2.5	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 0.2 A		1.4	3	
		V <sub>GS</sub> = 3 V, I <sub>D</sub> = 0.025 A		3.0	8	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.25 A		350		mS
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 0.23 A, V <sub>GS</sub> = 0 V		0.83	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 4.5 V I <sub>D</sub> ≅ 0.25 A		0.4	0.6	nC
Gate-Source Charge	Q <sub>gs</sub>			0.11		
Gate-Drain Charge	Q <sub>gd</sub>			0.15		
Gate Resistance	R <sub>g</sub>			173		Ω
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 30 V, R <sub>L</sub> = 150 Ω I <sub>D</sub> ≅ 0.2 A, V <sub>GEN</sub> = 10V R <sub>g</sub> = 10 Ω		3.8	10	ns
	t <sub>r</sub>			4.8	15	
Turn-Off Time	t <sub>d(off)</sub>			12.8	20	
	t <sub>f</sub>			9.6	15	

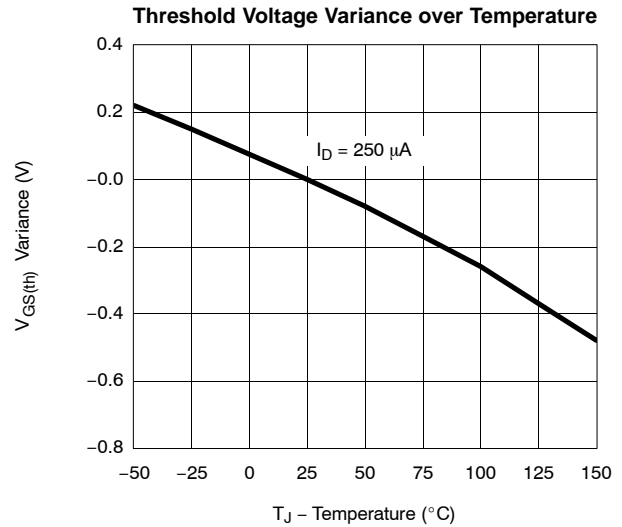
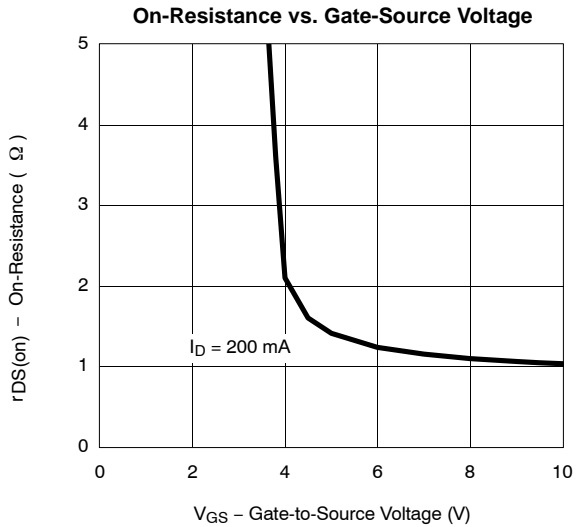
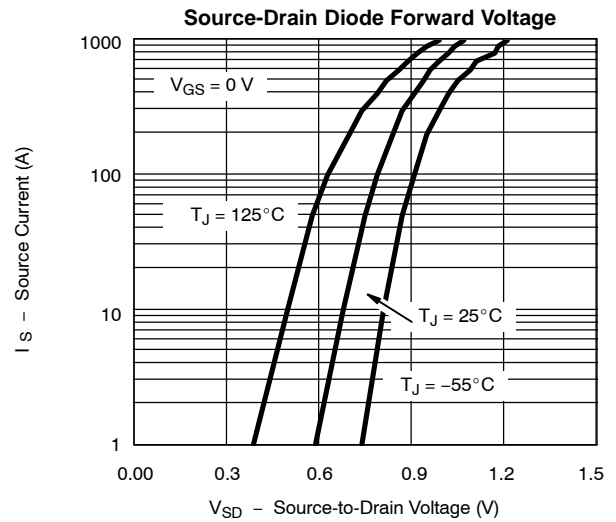
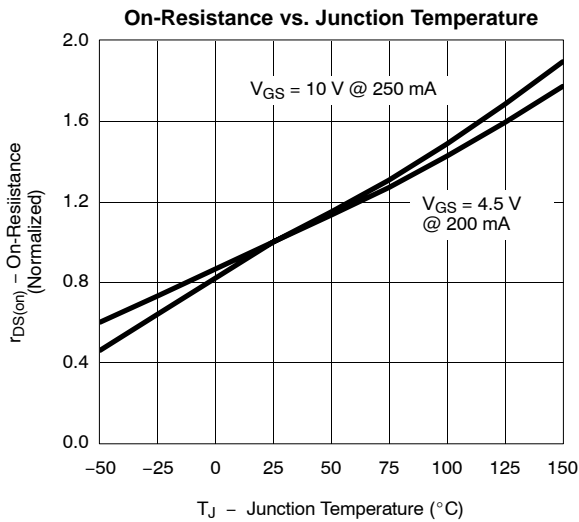
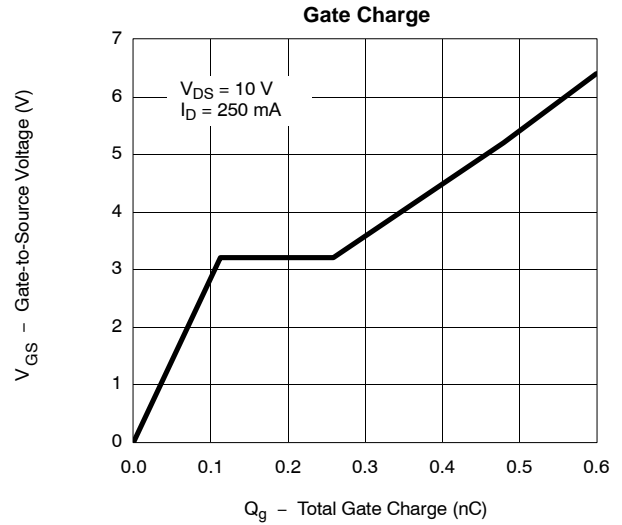
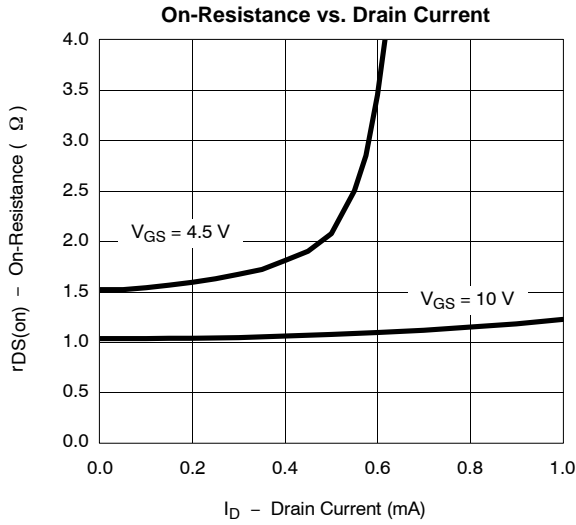
Notes

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

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

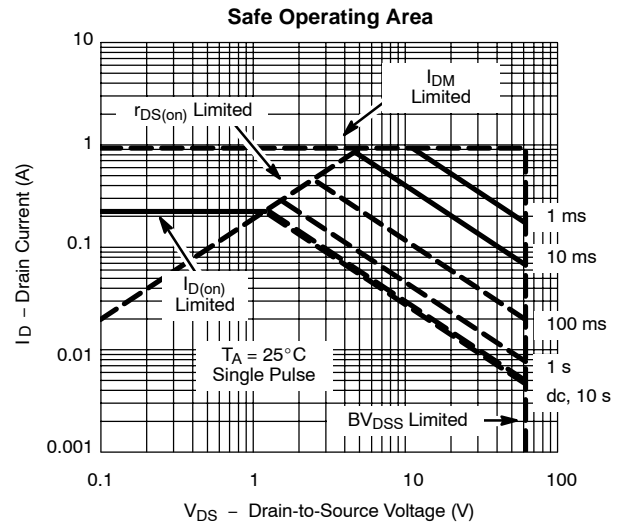
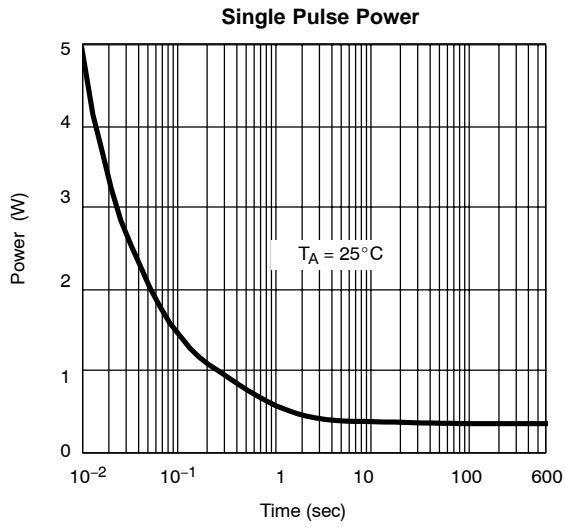


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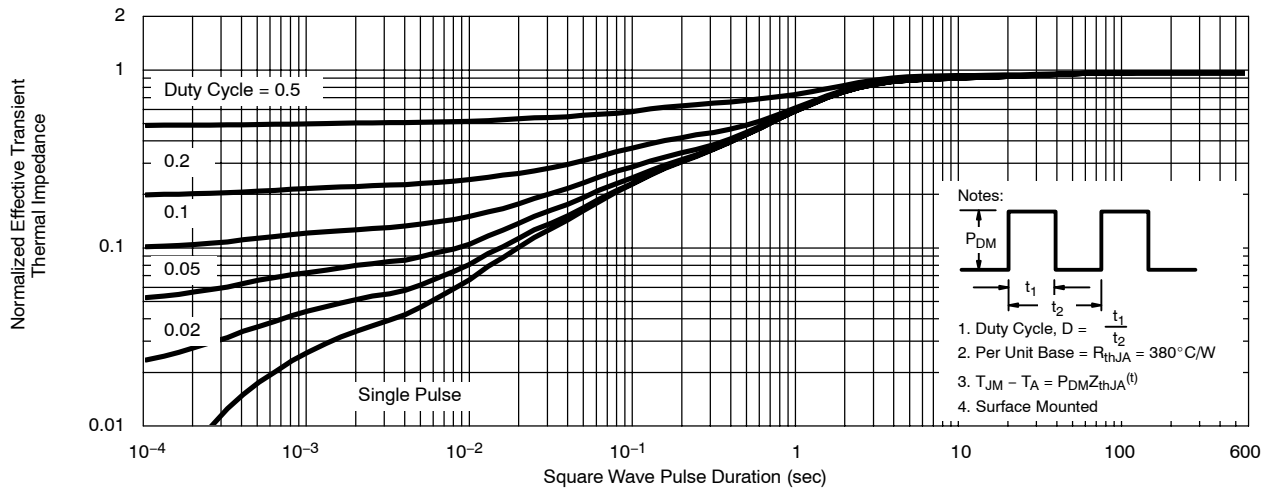




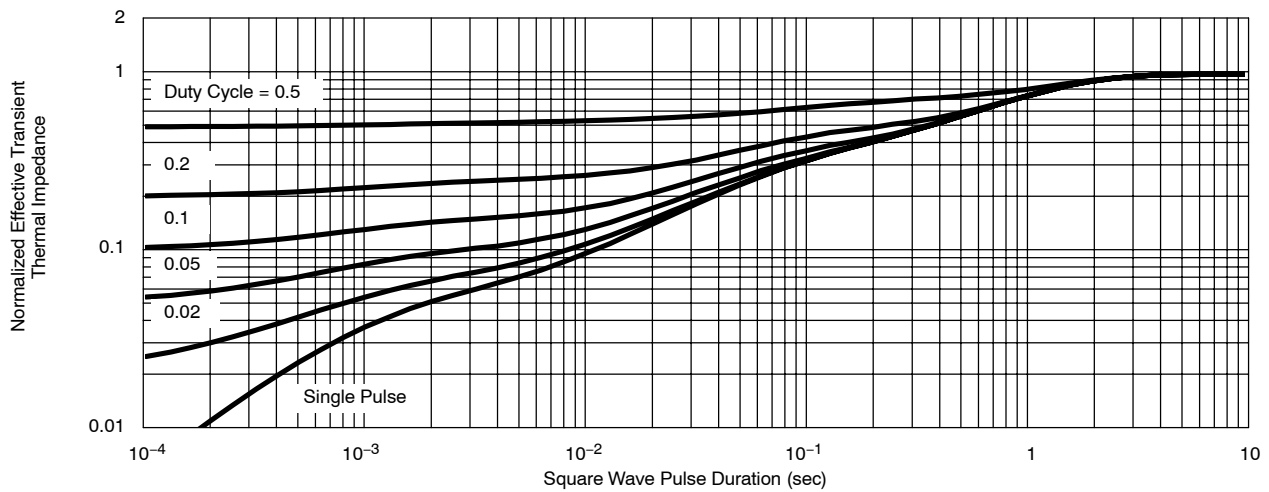
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



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



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





## Disclaimer

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