



## N-Channel 55-V (D-S) 175°C MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>a</sup>
55	0.020 @ $V_{GS} = 10$ V	35
	0.026 @ $V_{GS} = 4.5$ V	30

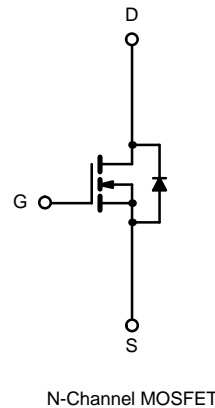
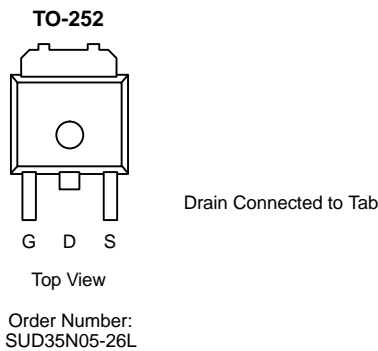
### FEATURES

- TrenchFET® Power MOSFETS
- 175°C Rated Maximum Junction Temperature
- Low Input Capacitance

### APPLICATIONS

- Automotive Fuel Injection Systems
- Automotive Wipers
- Automotive Door Modules

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ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	55	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ ) <sup>b</sup>	$I_D$	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
Pulsed Drain Current	$I_{DM}$	80	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	35	
Maximum Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	W
		$T_A = 25^\circ\text{C}$	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Junction-to-Ambient <sup>b</sup>	$R_{thJA}$	$t \leq 10$ sec	17	20	$^\circ\text{C/W}$
		Steady State	50	60	
Junction-to-Case	$R_{thJC}$	2.5	3.0		
Junction-to-Lead	$R_{thJL}$	5.0	6.0		

Notes

- Package Limited.
- Surface Mounted on 1" x 1" FR4 Board,  $t \leq 10$  sec.
- See SOA curve for voltage derating.

**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	55			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 44 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 44 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 5 V	35			A
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A		0.0165	0.020	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A, T <sub>J</sub> = 125 °C			0.035	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 15 A		0.0215	0.026	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 20 A		25		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, F = 1 MHz		885		pF
Output Capacitance	C <sub>oss</sub>			185		
Reverse Transfer Capacitance	C <sub>rss</sub>			80		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = 35 A		10.5	13	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			4		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			4.8		
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 25 V, R <sub>L</sub> = 0.3 Ω I <sub>D</sub> ≅ 35 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 2.5 Ω		5	8	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			18	30	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			20	30	
Fall Time <sup>c</sup>	t <sub>f</sub>			100	150	
<b>Source-Drain Diode Ratings and Characteristic (T<sub>C</sub> = 25 °C)</b>						
Continuous Current	I <sub>S</sub>				35	A
Pulsed Current	I <sub>SM</sub>				80	
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = 80 A, V <sub>GS</sub> = 0 V			1.5	V
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 35 A, di/dt = 100 A/μs		25	40	ns

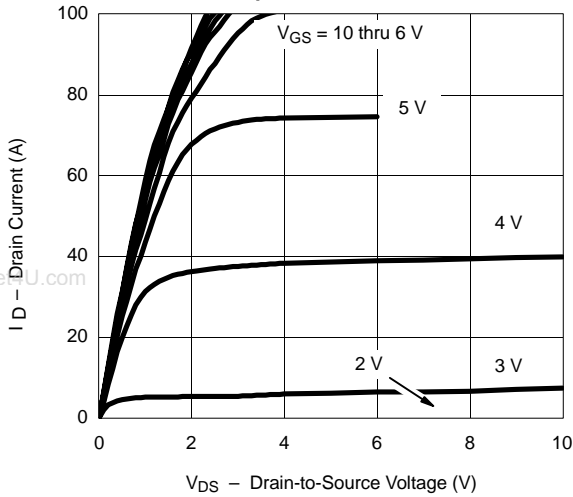
## Notes

- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Independent of operating temperature.

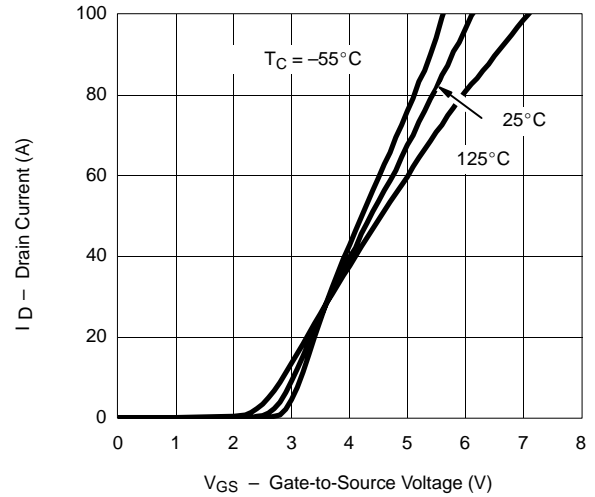


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

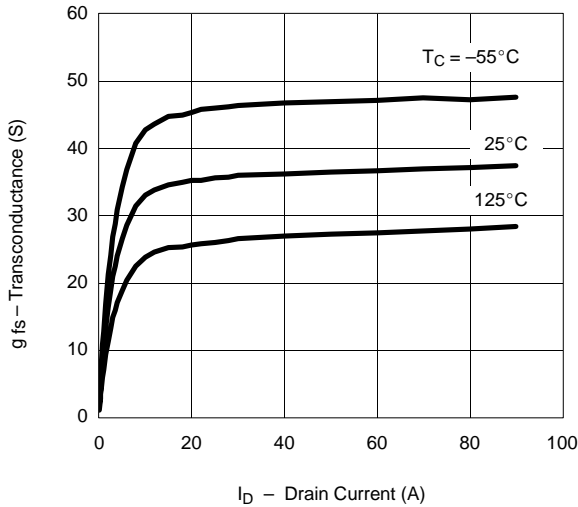
Output Characteristics



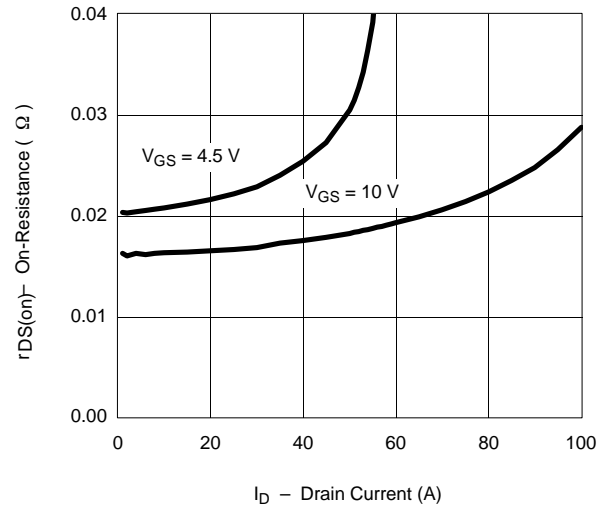
Transfer Characteristics



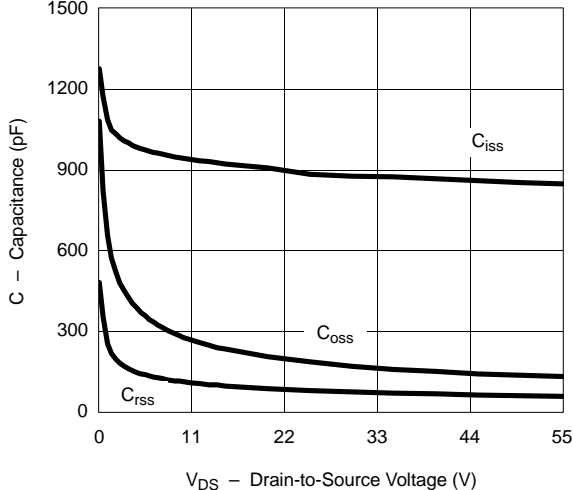
Transconductance



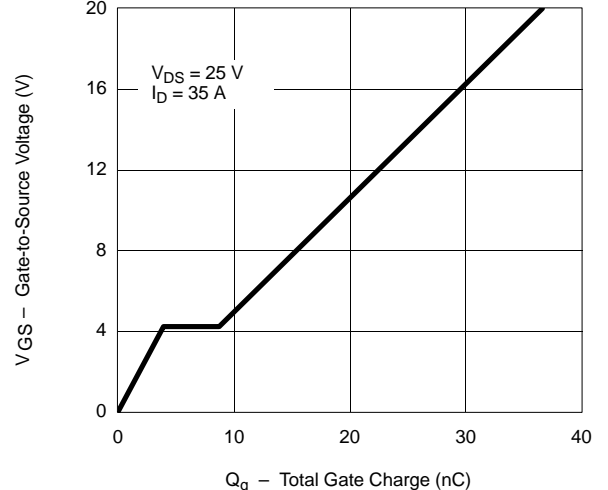
On-Resistance vs. Drain Current



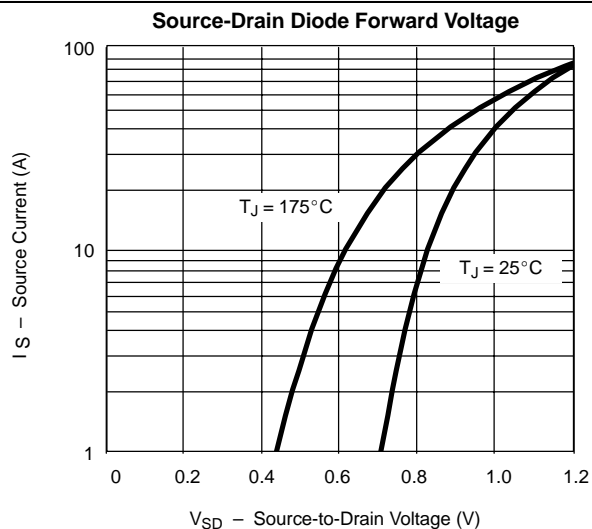
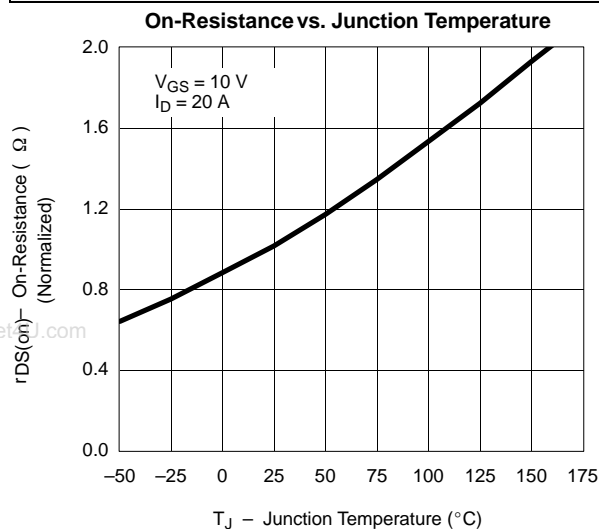
Capacitance



Gate Charge



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



### THERMAL RATINGS

