



New Product

Si4940DY
Vishay Siliconix

Dual N-Channel 40-V (D-S) MOSFET

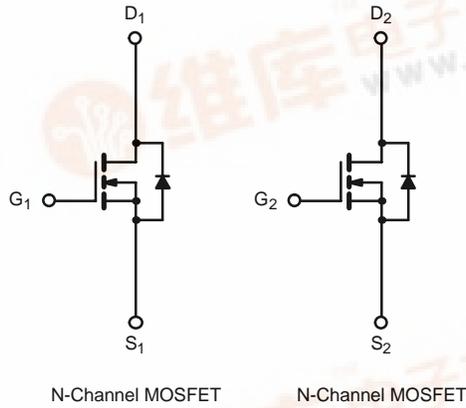
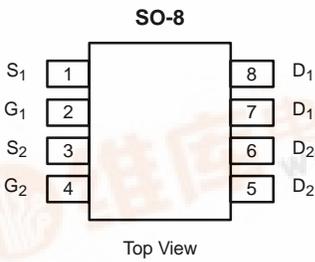
PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
40	0.036 @ V _{GS} = 10 V	5.7
	0.059 @ V _{GS} = 4.5 V	4.4

FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

- Automotive Airbags



ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	V _{DS}	40		V	
Gate-Source Voltage	V _{GS}	±20			
Continuous Drain Current (T _J = 150°C) ^a	I _D	T _A = 25°C	5.7	4.2	A
		T _A = 70°C	4.5	3.4	
Pulsed Drain Current	I _{DM}	30			
Continuous Source Current (Diode Conduction) ^a	I _S	1.8	0.9		
Maximum Power Dissipation ^a	P _D	T _A = 25°C	2.1	1.1	W
		T _A = 70°C	1.3	0.7	
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	R _{thJA}	t ≤ 10 sec	50	60	°C/W
		Steady State	90	110	
Maximum Junction-to-Foot (Drain)	R _{thJF}	28	34		

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



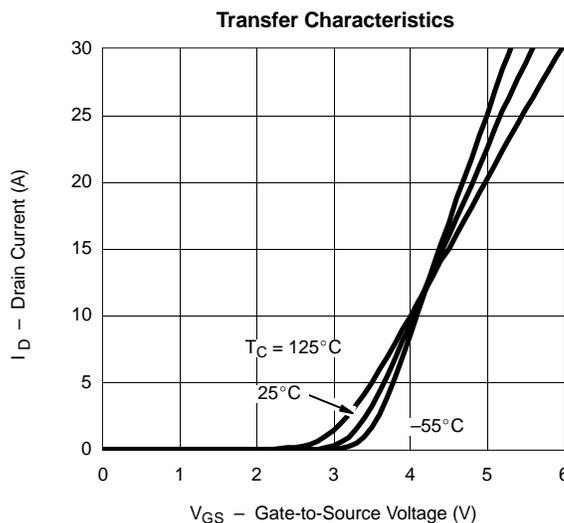
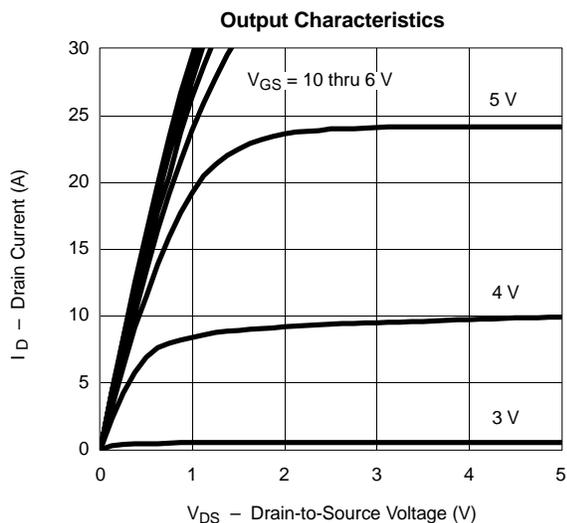
SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0			V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 32 V, V _{GS} = 0 V			1	μA
		V _{DS} = 32 V, V _{GS} = 0 V, T _J = 55 °C			5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	30			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 5.7 A		0.03	0.036	Ω
		V _{GS} = 4.5 V, I _D = 4.4 A		0.048	0.059	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 5.7 A		12		S
Diode Forward Voltage ^a	V _{SD}	I _S = 1.8 A, V _{GS} = 0 V		0.8	1.1	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 20 V, V _{GS} = 10 V, I _D = 5.7 A		9.0	14	nC
Gate-Source Charge	Q _{gs}			1.8		
Gate-Drain Charge	Q _{gd}			2.3		
Gate Resistance	R _G			1.0		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 20 V, R _L = 20 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω		7	15	ns
Rise Time	t _r			12	25	
Turn-Off Delay Time	t _{d(off)}			15	30	
Fall Time	t _f			8	15	
Source-Drain Reverse Recovery Time	t _{rr}		I _F = 1.8 A, di/dt = 100 A/μs		35	

Notes

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

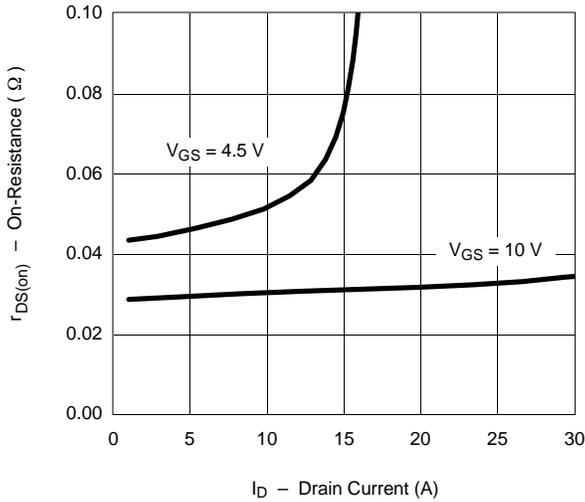
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



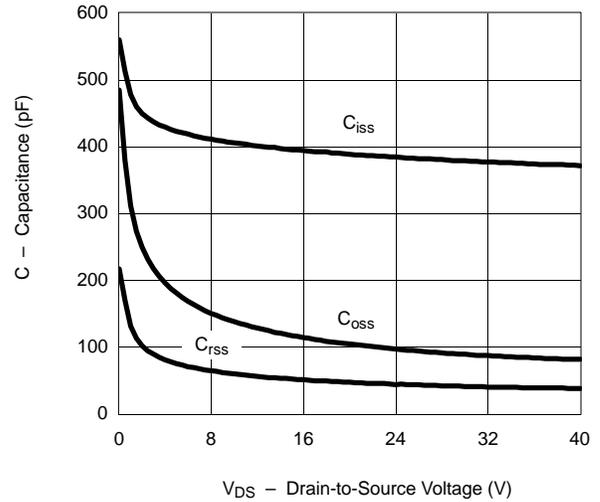


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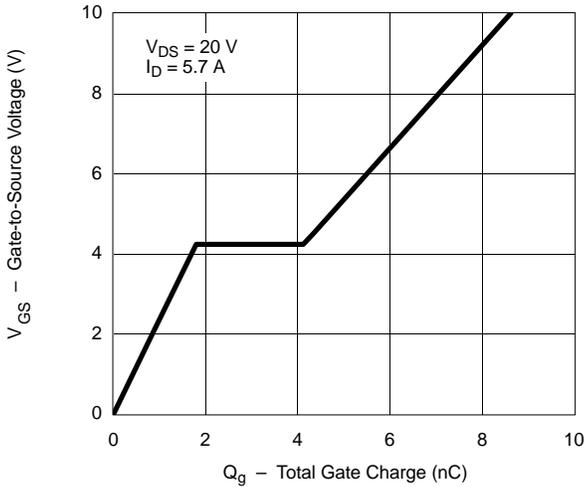
On-Resistance vs. Drain Current



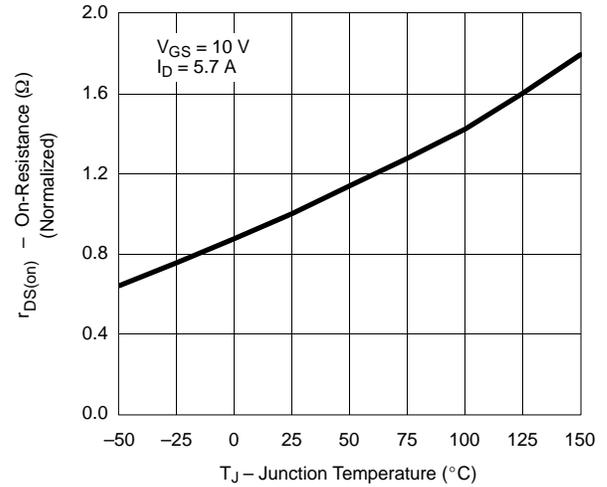
Capacitance



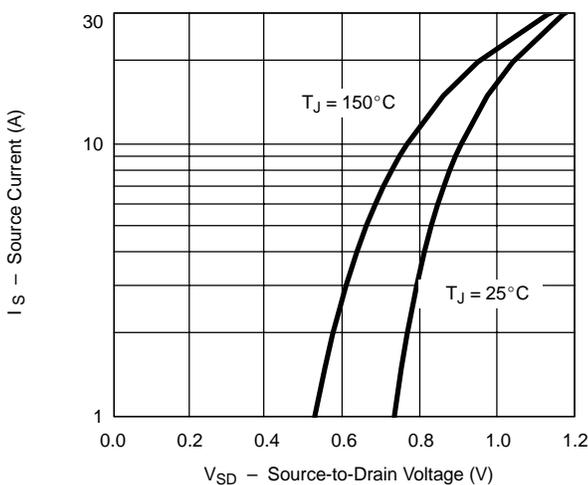
Gate Charge



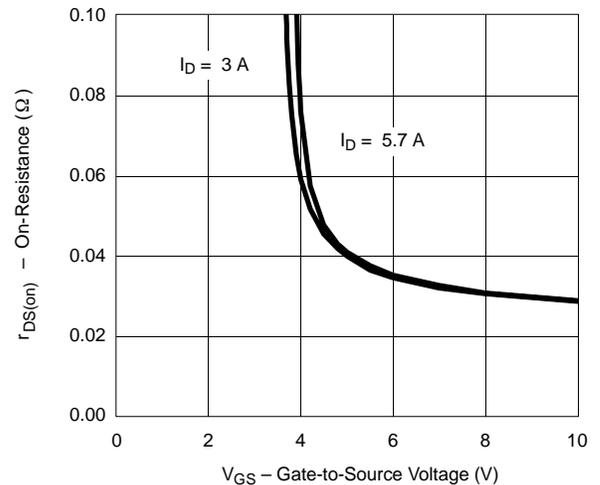
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

