

2N6659/2N6660, VQ1004J/P

N-Channel Enhancement-Mode MOSFET Transistors

Product Summary

Part Number	V(BR)DSS Min (V)	rDS(on) Max (Ω)	VGS(th) (V)	ID (A)
2N6659	35	1.8 @ VGS = 10 V	0.8 to 2	1.4
2N6660	60	3 @ VGS = 10 V	0.8 to 2	1.1
VQ1004J/P		3.5 @ VGS = 10 V	0.8 to 2.5	0.46

Features

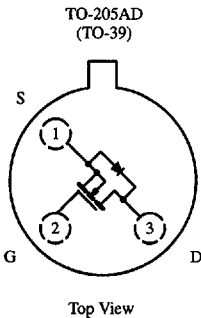
- Low On-Resistance: 1.3 Ω
- Low Threshold: 1.7 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 8 ns
- Low Input and Output Leakage

Benefits

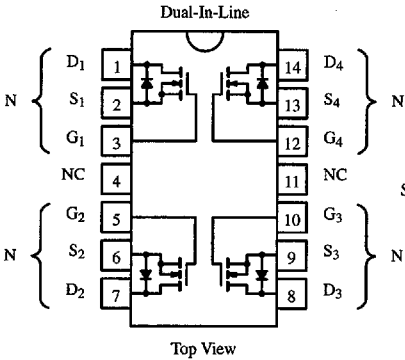
- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

Applications

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays



2N6659
2N6660



Plastic: VQ1004J
Sidebraze: VQ1004P

Absolute Maximum Ratings (TC = 25°C Unless Otherwise Noted)

Parameter	Symbol	2N6659	2N6660	Single		Total Quad	Unit
				VQ1004J	VQ1004P	VQ1004J/P	
Drain-Source Voltage	VDS	35	60	60	60		V
Gate-Source Voltage	VGS	±20	±20	±30	±20		
Continuous Drain Current (TJ = 150°C)	ID	1.4	1.1	0.46	±0.46		A
Pulsed Drain Current ^a	IDM	3	3	2	2		
Power Dissipation	PD	6.25	6.25	1.3	1.3	2	W
						0.8	
Maximum Junction-to-Ambient ^b	RthJA	170	170	0.96	0.96	62.5	°C/W
Maximum Junction-to-Case	RthJC	20	20				
Operating Junction and Storage Temperature Range	TJ, Tstg	-55 to 150					°C

Notes
a. Pulse width limited by maximum junction temperature.
b. This parameter not registered with JEDEC.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70222.

Specifications^a

Parameter	Symbol	Test Conditions	Typ ^b	Limits						Unit	
				2N6659		2N6660		VQ1004J/P			
				Min	Max	Min	Max	Min	Max		
Static											
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 10 μA	75	35		60		60		V	
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1 mA	1.7	0.8	2	0.8	2	0.8	2.5		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 15 V T _C = 125°C			± 100 ± 500		± 100 ± 500		± 100 ± 500	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V V _{DS} = 35 V, V _{GS} = 0 V V _{DS} = 48 V, V _{GS} = 0 V T _C = 125°C V _{DS} = 28 V, V _{GS} = 0 V T _C = 125°C					10		1 500	μA	
On-State Drain Current ^c	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 10 V	3	1.5		1.5		1.5		A	
Drain-Source On-Resistance ^c	r _{DS(on)}	V _{GS} = 5 V, I _D = 0.3 A ^e V _{GS} = 10 V, I _D = 1 A T _C = 125°C ^c	2 1.3 2.4		5 1.8 3.6		5 3 4.2		5 3.5 4.9	Ω	
Forward Transconductance ^c	g _{fs}	V _{DS} = 10 V, I _D = 0.5 A	350	170		170		170		mS	
Common Source Output Conductance ^c	g _{os}	V _{DS} = 10 V, I _D = 0.1 A	1								
Diode Forward Voltage	V _{SD}	I _S = 0.99 A, V _{GS} = 0 V	0.8							V	
Dynamic											
Input Capacitance	C _{iss}	V _{DS} = 24 V, V _{GS} = 0 V f = 1 MHz	35		50		50		60	pF	
Output Capacitance	C _{oss}		25		40		40		50		
Reverse Transfer Capacitance	C _{rss}		7		10		10		10		
Drain-Source Capacitance	C _{ds}		30		40		40				
Switching ^d											
Turn-On Time	t _{ON}	V _{DD} = 25 V, R _L = 23 Ω I _D ≅ 1 A, V _{GEN} = 10 V	8		10		10		10	ns	
Turn-Off Time	t _{OFF}	R _G = 25 Ω	8.5		10		10		10		

Notes

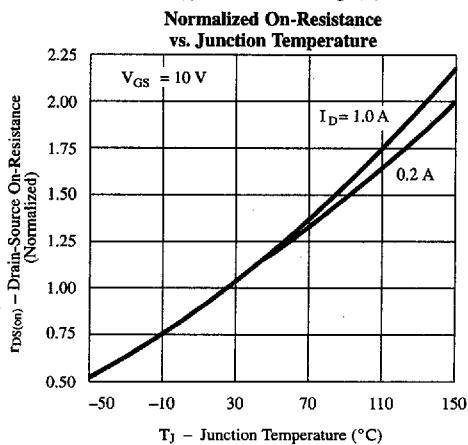
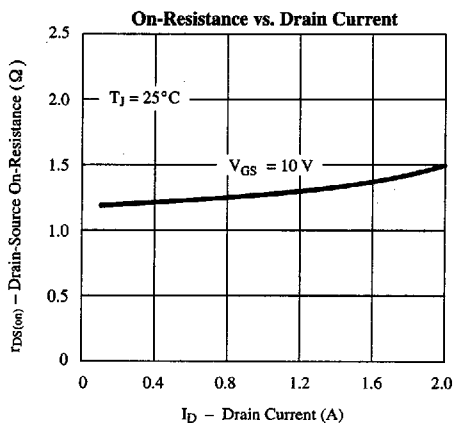
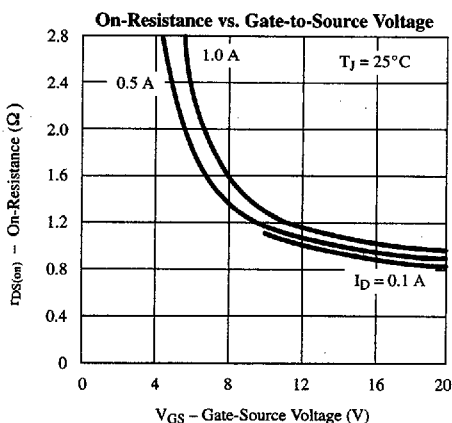
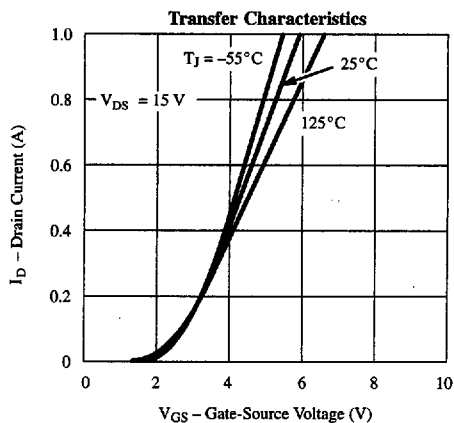
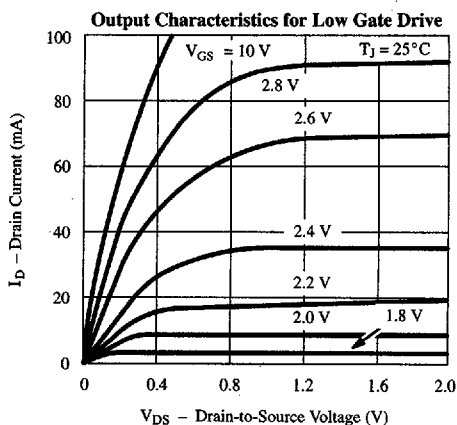
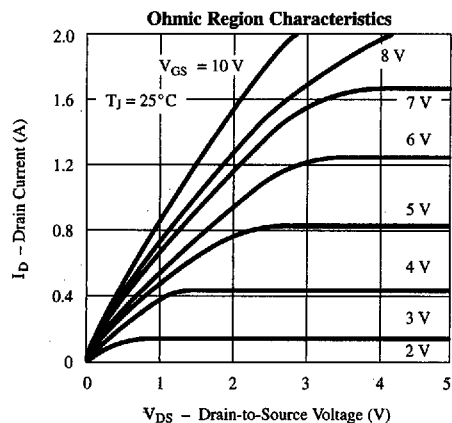
- $T_A = 25^\circ\text{C}$ unless otherwise noted.
- For DESIGN AID ONLY, not subject to production testing.
- Pulse test: $PW \leq 80\text{ }\mu\text{s}$ duty cycle $\leq 1\%$.
- Switching time is essentially independent of operating temperature.
- This parameter not registered with JEDEC on 2N6659 and 2N6660.

VNDQ06

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Low Power MOSFETs

Typical Characteristics (25°C Unless Otherwise Noted)



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