



Complementary N- and P-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY			
	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (mA)
N-Channel	60	1.40 @ V _{GS} = 10 V	500
		3 @ V _{GS} = 4.5 V	200
P-Channel	-60	4 @ V _{GS} = -10 V	-500
		8 @ V _{GS} = -4.5 V	-25



FEATURES

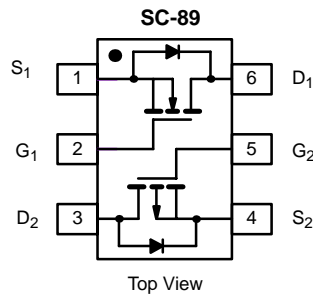
- Very Small Footprint
- High-Side Switching
- Low On-Resistance:
N-Channel, 1.40 Ω
P-Channel, 4 Ω
- Low Threshold: ±2 V (typ)
- Fast Switching Speed: 15 ns (typ)
- Gate-Source ESD Protection

BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits

APPLICATIONS

- Replace Digital Transistor, Level-Shifter
- Battery Operated Systems
- Power Supply Converter Circuits



Marking Code: H

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		5 secs	Steady State	5 secs	Steady State		
Drain-Source Voltage	V _{DS}	60		-60		V	
Gate-Source Voltage	V _{GS}	±20					
Continuous Drain Current (T _J = 150 °C) ^a	I _D	T _A = 25 °C	320	305	-200	-190	mA
		T _A = 85 °C	230	220	-145	-135	
Pulsed Drain Current ^b	I _{DM}	650		-650			
Continuous Source Current (Diode Conduction) ^a	I _S	450	380	-450	-380		
Maximum Power Dissipation ^a	P _D	T _A = 25 °C	280	250	280	250	mW
		T _A = 85 °C	145	130	145	130	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150				°C	
Gate-Source ESD Rating (HBM, Method 3015)	ESD	2000				V	

Notes

- a. Surface Mounted on FR4 Board.
- b. Pulse width limited by maximum junction temperature.



SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
Static							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 10 μA	N-Ch	60			V
		V _{GS} = 0 V, I _D = -10 μA	P-Ch	-60			
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	N-Ch	1		2.5	
		V _{DS} = V _{GS} , I _D = -250 μA	P-Ch	-1.0		-3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±5 V	N-Ch			±50	nA
		V _{DS} = 0 V, V _{GS} = ±10 V	P-Ch			±100	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V	N-Ch			10	
		V _{DS} = -50 V, V _{GS} = 0 V	P-Ch			-25	
		V _{DS} = 50 V, V _{GS} = 0 V, T _J = 85 °C	N-Ch			100	
		V _{DS} = -50 V, V _{GS} = 0 V, T _J = 85 °C	P-Ch			-250	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 4.5 V	N-Ch	500			mA
		V _{DS} = -10 V, V _{GS} = -4.5 V	P-Ch	-50			
		V _{DS} = 7.5 V, V _{GS} = -4.5 V	N-Ch	800			
		V _{DS} = -10 V, V _{GS} = -10 V	P-Ch	-600			
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 200 mA	N-Ch			3	Ω
		V _{GS} = -4.5 V, I _D = -25 mA	P-Ch			8	
		V _{GS} = 10 V, I _D = 500 mA	N-Ch			1.40	
		V _{GS} = -10 V, I _D = -500 mA	P-Ch			4	
		V _{GS} = 10 V, I _D = 500 mA, T _J = 125 °C	N-Ch			2.50	
		V _{GS} = -10 V, I _D = -500 mA, T _J = 125 °C	P-Ch			6	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 200 mA	N-Ch		200		mS
		V _{DS} = -10 V, I _D = -100 mA	P-Ch		100		
Diode Forward Voltage ^a	V _{SD}	I _S = 200 mA, V _{GS} = 0 V	N-Ch			1.4	V
		I _S = -200 mA, V _{GS} = 0 V	P-Ch			-1.4	
Dynamic^b							
Total Gate Charge	Q _g	N-Channel V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 250 mA P-Channel V _{DS} = -30 V, V _{GS} = -15 V, I _D = -500 mA	N-Ch		750		pC
Gate-Source Charge	Q _{gs}		N-Ch		75		
Gate-Drain Charge	Q _{gd}		P-Ch		260		
Input Capacitance	C _{iss}	N-Channel V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz P-Channel V _{DS} = -25 V, V _{GS} = 0 V, f = 1 MHz	N-Ch		30		pF
Output Capacitance	C _{oss}		P-Ch		23		
Reverse Transfer Capacitance	C _{rss}		N-Ch		6		
			P-Ch		10		
Turn-On Time ^c	t _{ON}	N-Channel V _{DD} = 30 V, R _L = 150 Ω I _D ≅ 200 mA, V _{GEN} = 10 V, R _G = 10 Ω	N-Ch		15		ns
Turn-Off Time ^c	t _{OFF}		P-Ch		20		
		P-Channel V _{DD} = -25 V, R _L = 150 Ω I _D ≅ -165 mA, V _{GEN} = -10 V, R _G = 10 Ω	N-Ch		20		
			P-Ch		35		

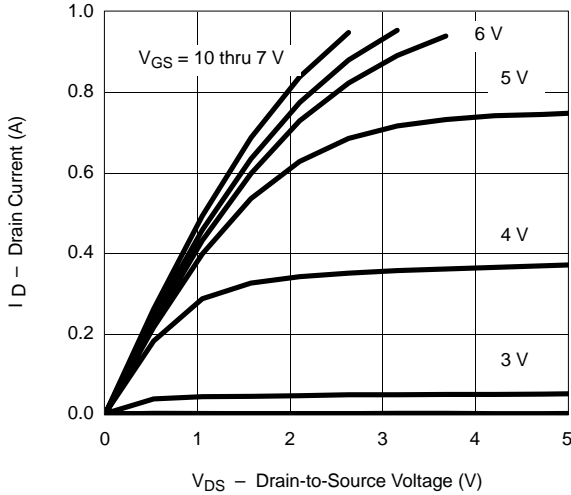
Notes

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

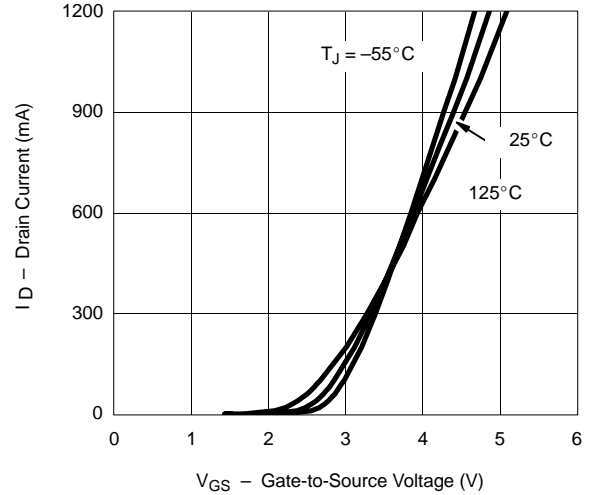


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS NOTED) N-CHANNEL

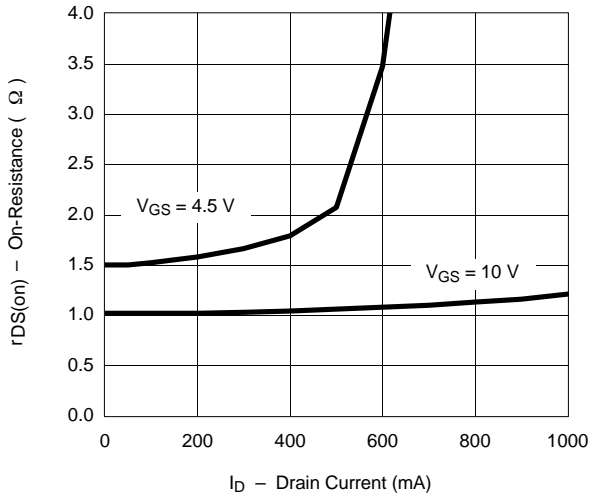
Output Characteristics



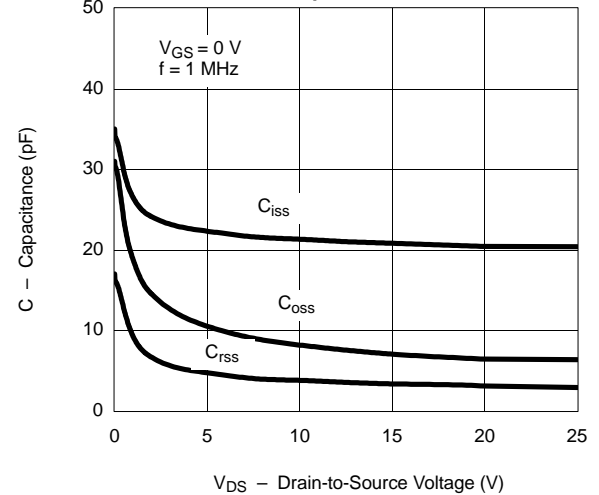
Transfer Characteristics



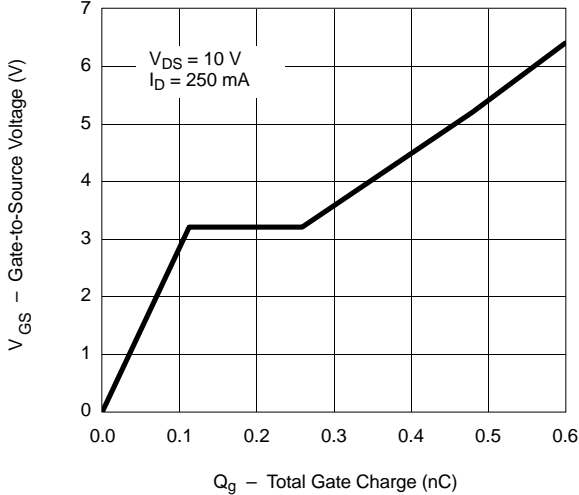
On-Resistance vs. Drain Current



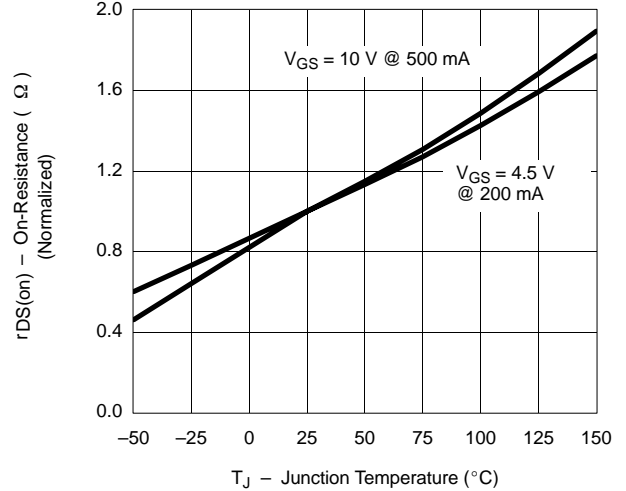
Capacitance



Gate Charge



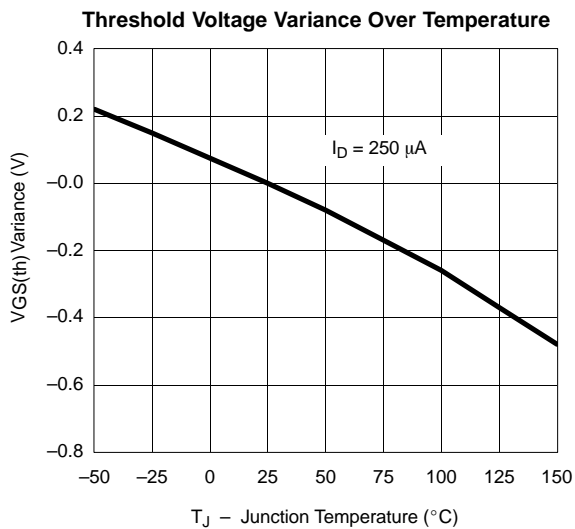
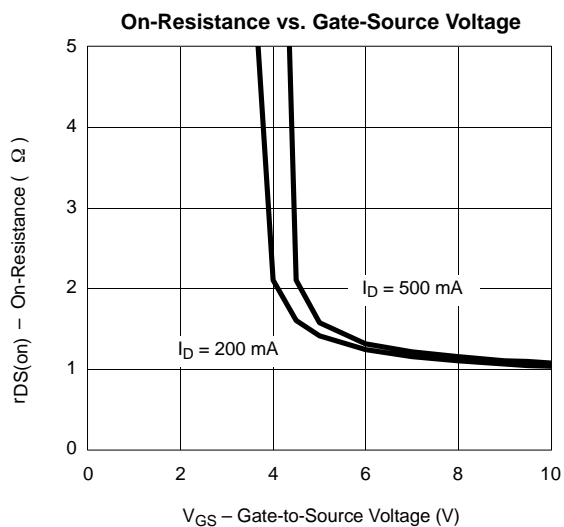
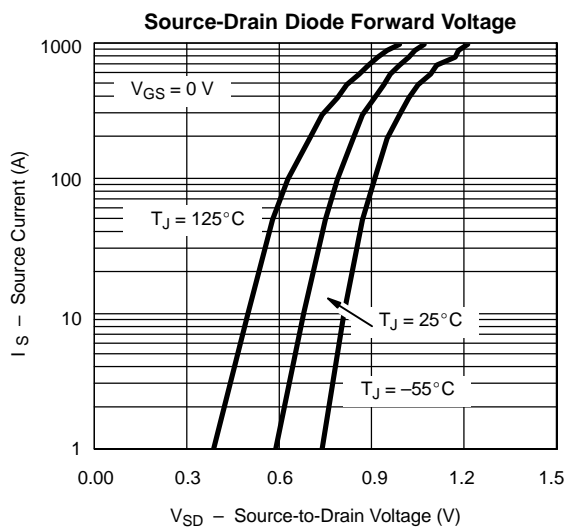
On-Resistance vs. Junction Temperature





TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS NOTED)

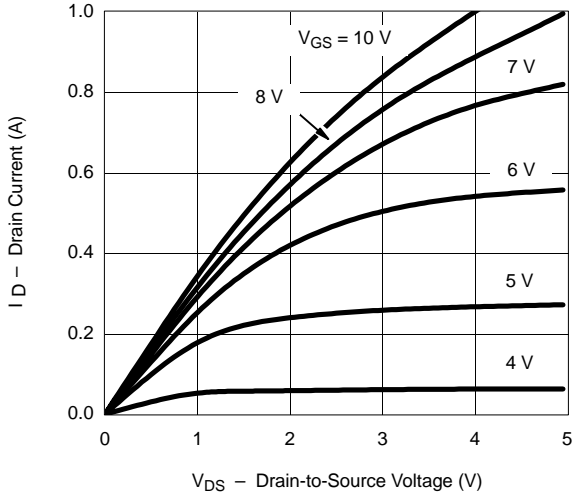
N-CHANNEL



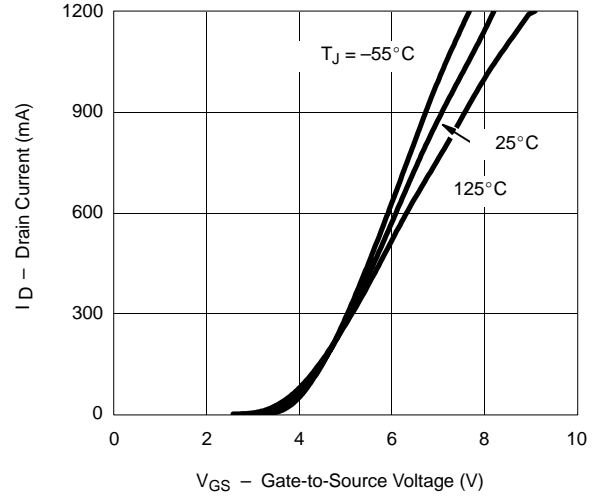


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS NOTED) P-CHANNEL

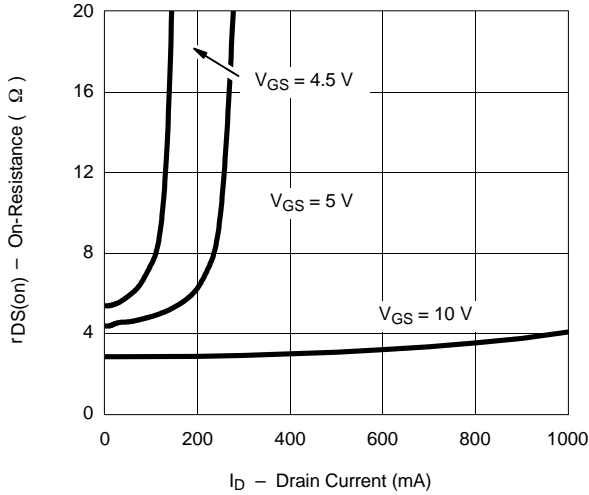
Output Characteristics



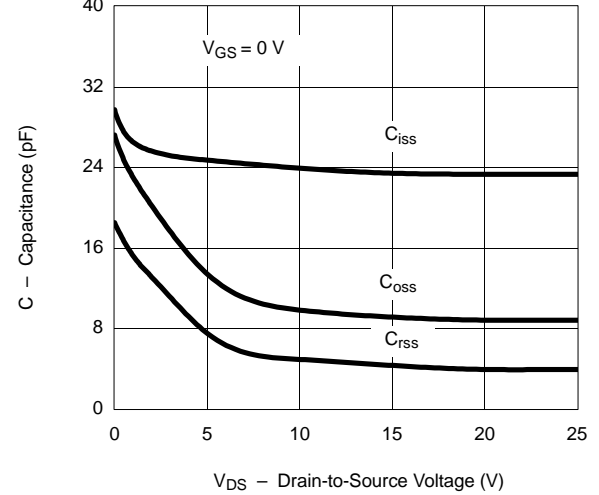
Transfer Characteristics



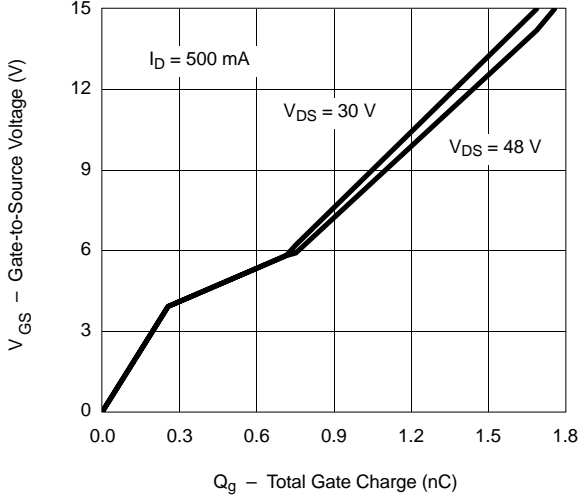
On-Resistance vs. Drain Current



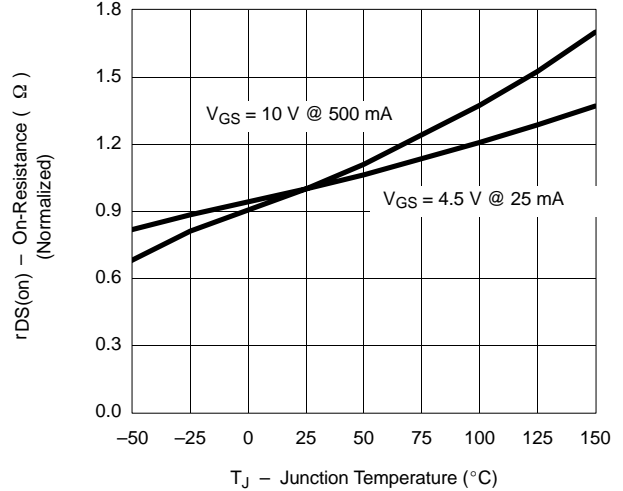
Capacitance



Gate Charge

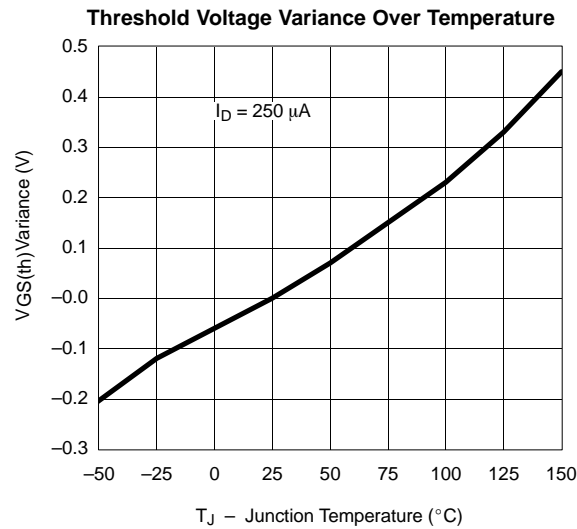
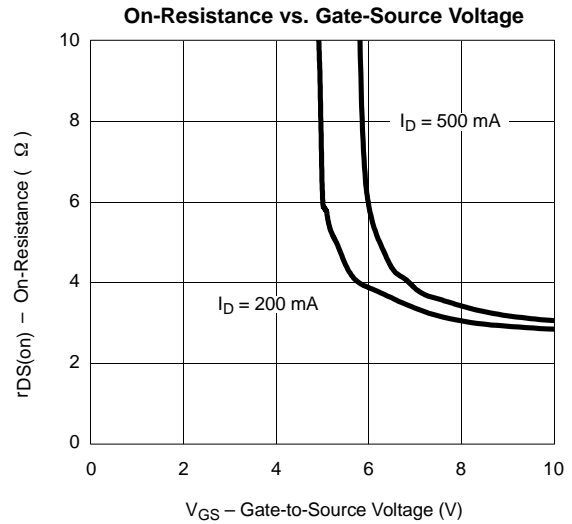
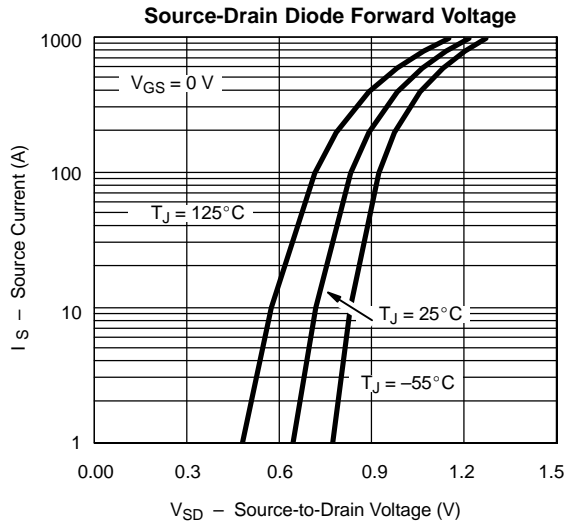


On-Resistance vs. Junction Temperature





TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS NOTED) P-CHANNEL



TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS NOTED) N- OR P-CHANNEL

