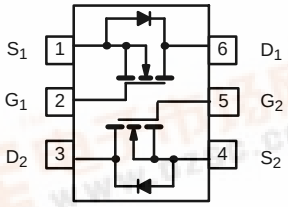
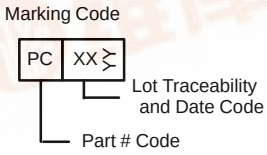
N-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (mA)
20	2.0 @ V_{GS} = 4.5 V	250
	2.5 @ V_{GS} = 2.5 V	150

SOT-363
SC-70 (6-Leads)



Top View



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	250	mA
	T_A = 70°C		200	
Pulsed Drain Current		I_{DM}	500	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	0.20	W
	T_A = 70°C		0.13	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient[a]	R_{thJA}	625	°C/W

Notes
a. Surface Mounted on FR4 Board, t ≤ 10 sec.

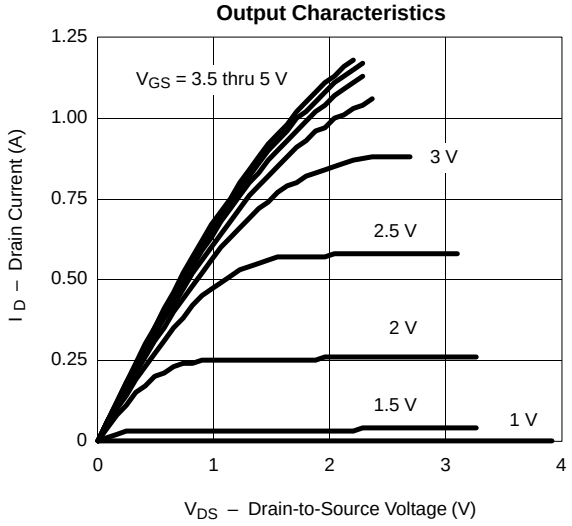
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{DS} = 0 V, I_D = 10 μA	20	24		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 50 μA	0.4	0.9	1.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V		±2	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V		0.001	100	
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 55°C			5	μA
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 5.0 V, V_{GS} = 2.5 V	120	160		mA
		V_{DS} = 8.0 V, V_{GS} = 4.5 V	400	800		
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 2.5 V, I_D = 150 mA		1.6	2.5	Ω
		V_{GS} = 4.5 V, I_D = 250 mA		1.2	2.0	
Forward Transconductance[a]	g_{fs}	V_{DS} = 2.5 V, I_D = 50 mA		200		mS
Diode Forward Voltage[a]	V_{SD}	I_S = 50 mA, V_{GS} = 0 V		0.7	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS} = 5.0 V, V_{GS} = 4.5 V, I_D = 100 mA		350	450	pC
Gate-Source Charge	Q_{gs}			25		
Gate-Drain Charge	Q_{gd}			100		
Input Capacitance	C_{iss}	V_{DS} = 5.0 V, V_{GS} = 0 V, f = 1 MHz		20		pF
Output Capacitance	C_{oss}			14		
Reverse Transfer Capacitance	C_{rss}			5		
Switching[b, c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 3.0 V, R_L = 100 Ω I_D = 0.25 A, V_{GEN} = 4.5 V, R_G = 10 Ω		7	12	ns
Rise Time	t_r			25	35	
Turn-Off Delay Time	$t_{d(off)}$			19	30	
Fall Time	t_f			9	15	

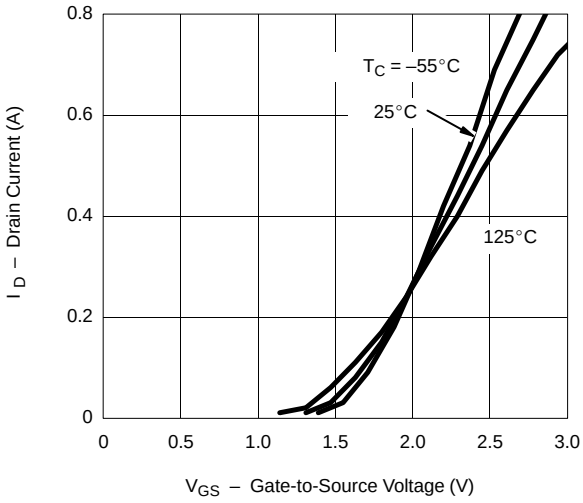
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. For design only, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

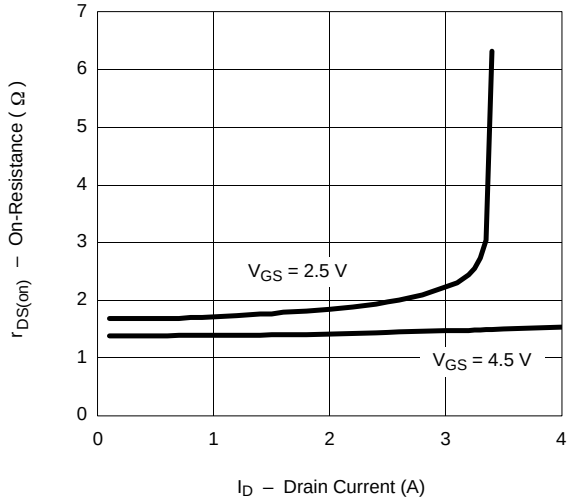
Output Characteristics



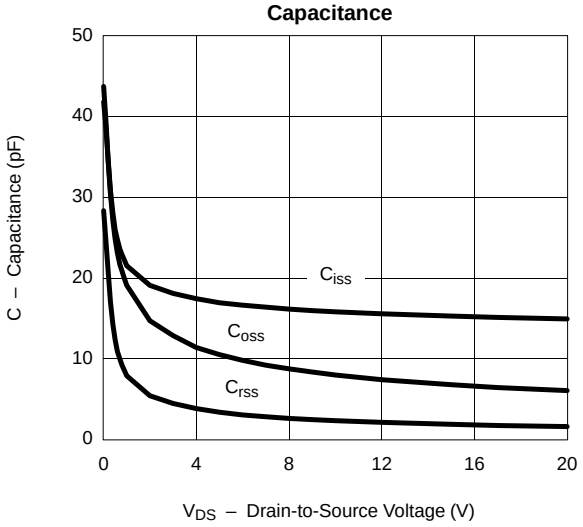
Transfer Characteristics



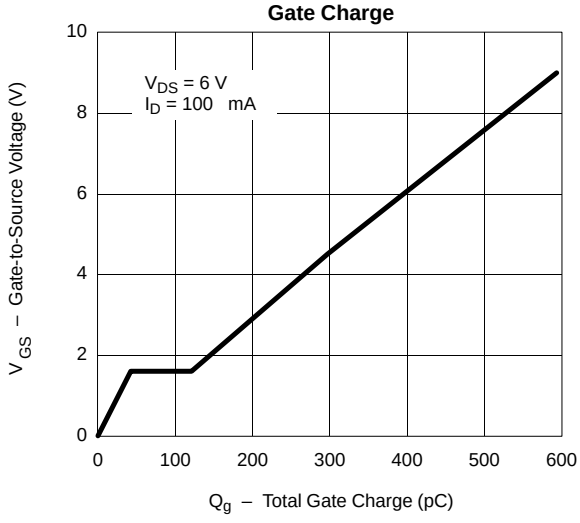
On-Resistance vs. Drain Current



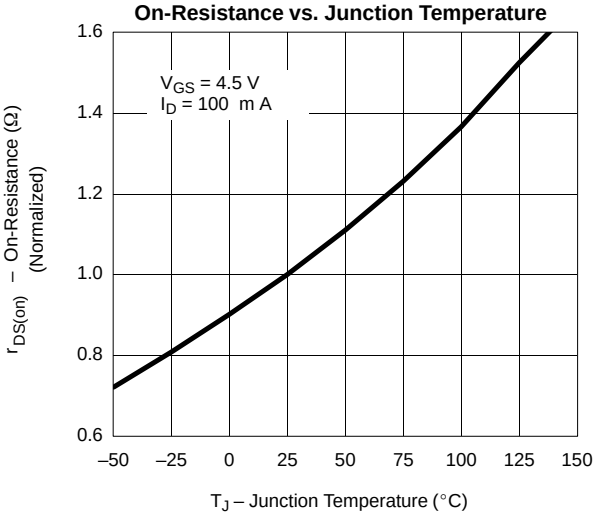
Capacitance



Gate Charge

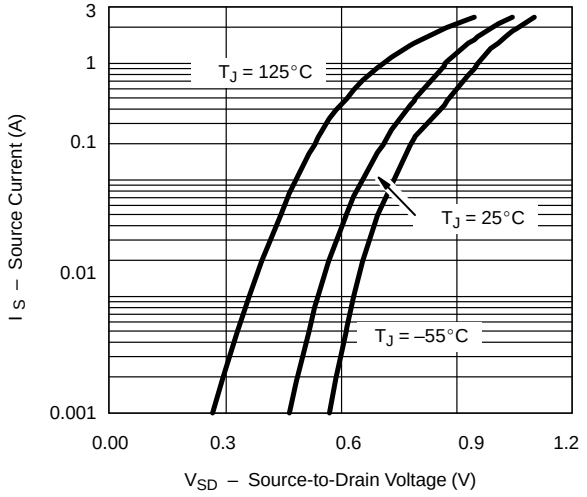


On-Resistance vs. Junction Temperature

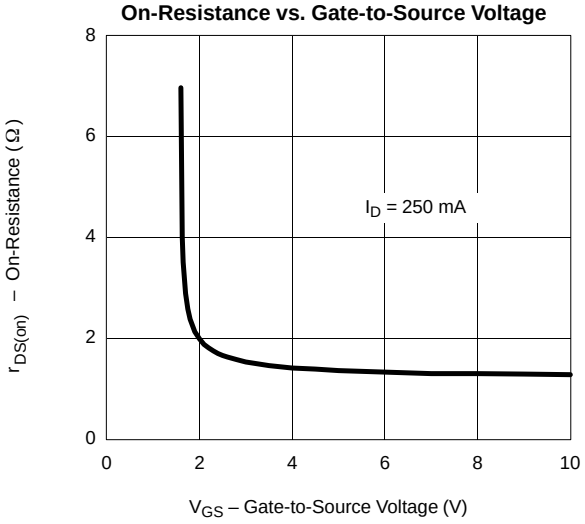


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage