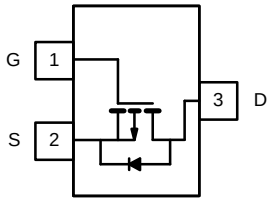
P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
–30	0.055 @ V_{GS} = –10 V	–4.1
	0.075 @ V_{GS} = –4.5 V	–3.0

(SOT-23)



Top View

TF2307

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLSS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	–30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150°C)[a, b]	T_A= 25°C	I_D	–4.1	A
Pulsed Drain Current		I_{DM}	–12	
Continuous Source Current (Diode Conduction)[a, b]		I_S	–1.25	
Power Dissipation[a, b]	T_A= 25°C	P_D	1.25	W
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]	t ≤ 5 sec	R_{thJA}		100	°C/W
	Steady State		130		

Notes
a. Surface mounted on FR4 board.
b. t ≤ 5 sec.

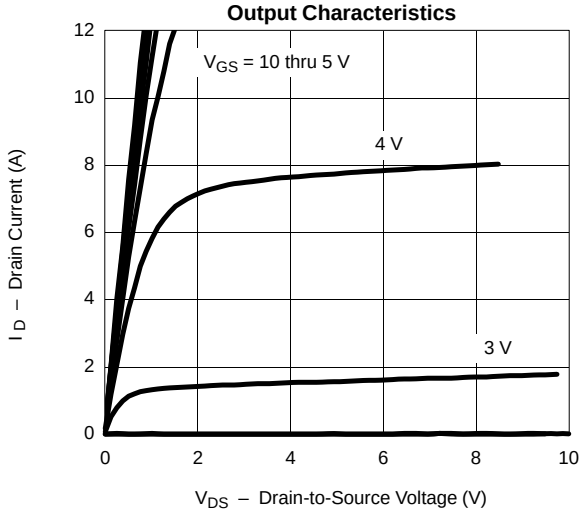
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = –10 μA	–30			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –250 μA	–0.8		3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –24 V, V_{GS} = 0 V			–1	μA
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ –5 V, V_{GS} = –10 V	–6			A
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = –10 V, I_D = –4.1 A		0.050	0.055	Ω
		V_{GS} = –4.5 V, I_D = –3.0 A		0.065	0.075	
Forward Transconductance[a]	g_{fs}	V_{DS} = –10V, I_D = –3 A		4.5		S
Diode Forward Voltage	V_{SD}	I_S = –1.25 A, V_{GS} = 0 V			–1.0	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = –15 V, V_{GS} = –10 V I_D ≅ –3 A		10	15	nC
Gate-Source Charge	Q_{gs}			1.9		
Gate-Drain Charge	Q_{gd}			2		
Input Capacitance	C_{iss}	V_{DS} = –15 V, V_{GS} = 0, f = 1 MHz		565		pF
Output Capacitance	C_{oss}			126		
Reverse Transfer Capacitance	C_{rss}			75		
Switching[b]						
Turn-On Time	$t_{d(on)}$	V_{DD} = –15 V, R_L = 15 Ω I_D ≅ –1.0 A, V_{GEN} = –10 V R_G = 6 Ω		10	20	ns
	t_r			9	20	
Turn-Off Time	$t_{d(off)}$			27	50	
	t_f			7	16	

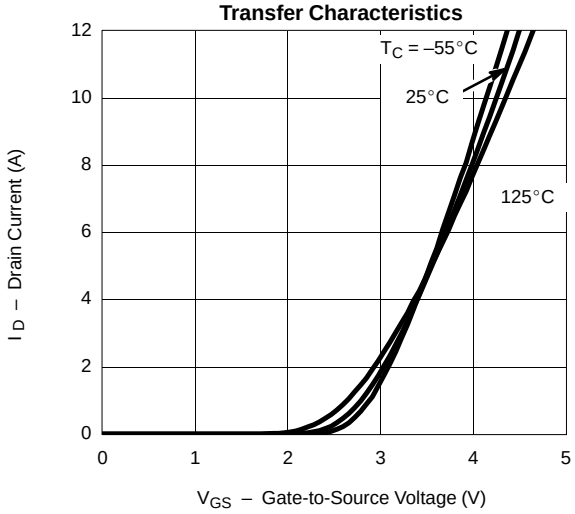
Notes
a. Pulse test: PW ≤300 μs duty cycle ≤2%.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

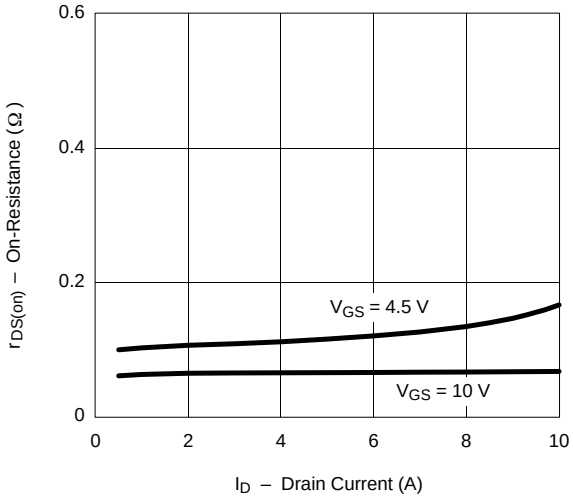
Output Characteristics



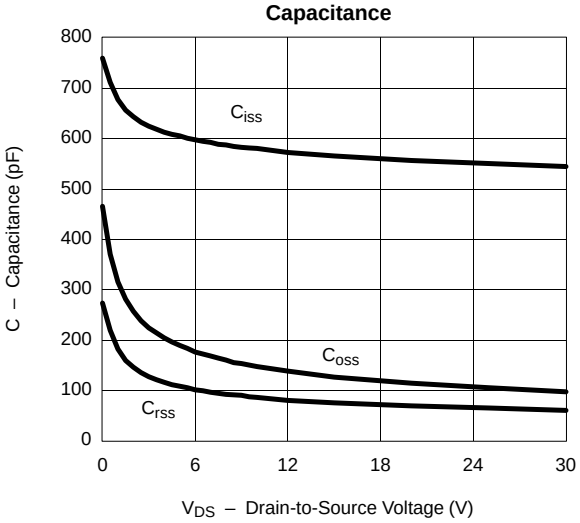
Transfer Characteristics



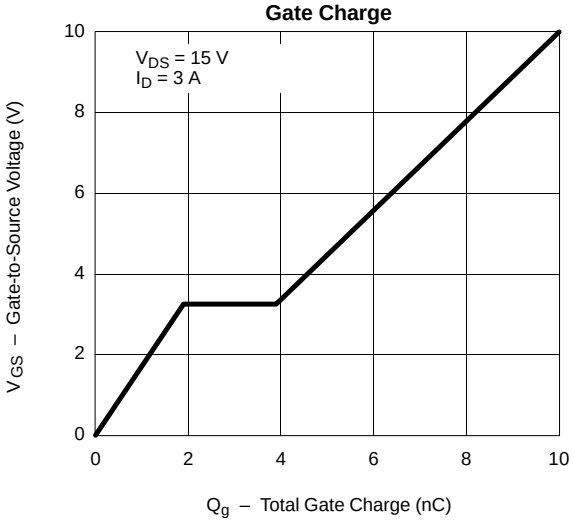
On-Resistance vs. Drain Current



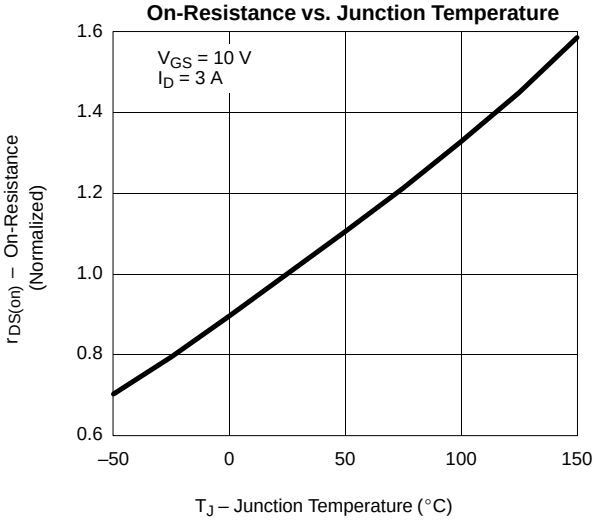
Capacitance



Gate Charge

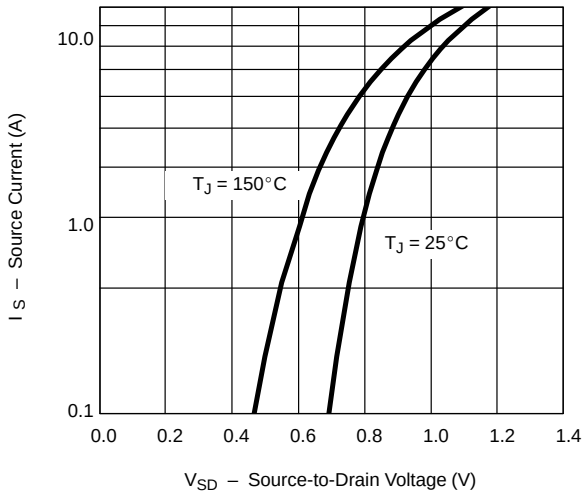


On-Resistance vs. Junction Temperature

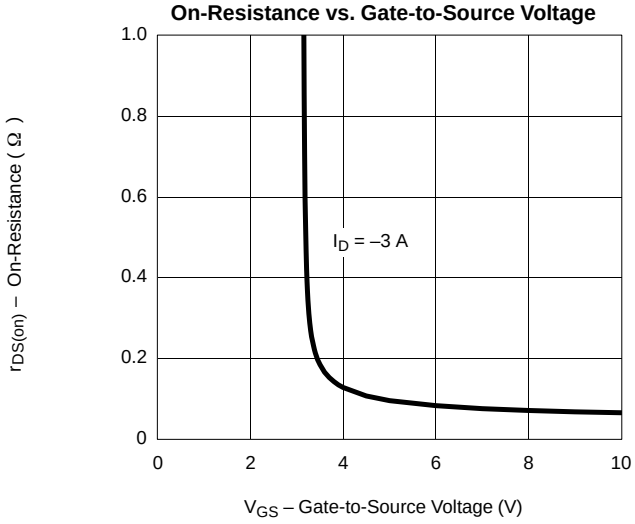


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

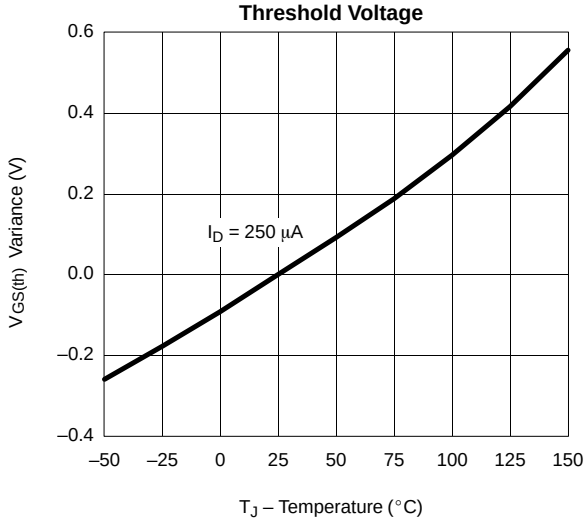
Source-Drain Diode Forward Voltage



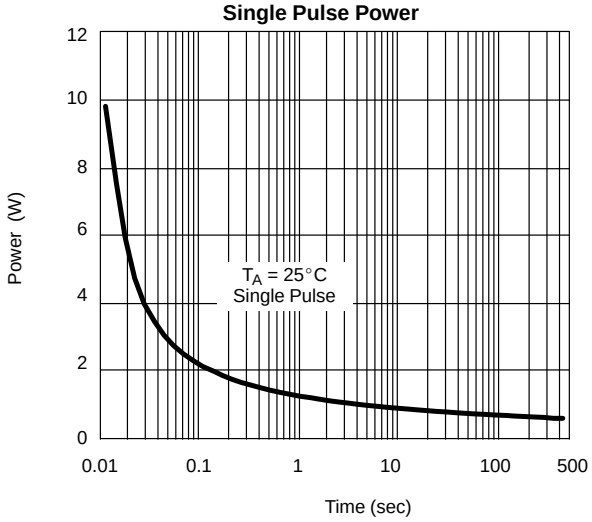
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient