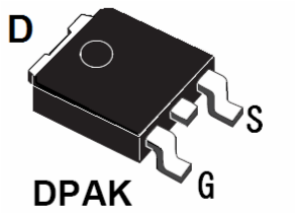
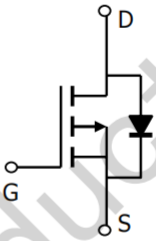
■ DESCRIPTION

The IRFR5305 is P channel enhancement mode power effect transitor which is produced using high cell density advanced trench technology.

The high density process is especially able to minize on-state resistance.These devices are. especially suited for low voltage application power management DC-DC converters.

■ PIN CONFIGURATION





■ FEATURE

- ***-60V/-26 A, $R_{DS(ON)}$=16 mΩ(typ.)@VGS= -10V***
- ***-60V/-20A, $R_{DS(ON)}$=25 mΩ(typ.)@VGS= -4.5V***
- Super high design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- Full RoHS compliance
- TO252 package design
- 100% UIS Tested
- 100% Rg tested

■ APPLICATIONS

- Power Management
- DC/DC Converter
- Load Switch

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ Unless otherwise noted)

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [G]	T_C=25°C	I_D	-26	A
	T_C=100°C		-18	
Pulsed Drain Current [C]		I_{DM}	-60	
Avalanche Current [C]		I_{AR}	-26	A
Repetitive avalanche energy L=0.1mH [C]		E_{AR}	33.8	mJ
Power Dissipation [B]	T_C=25°C	P_D	60	W
	T_C=100°C		30	
Power Dissipation [A]	T_A=25°C	P_{DSM}	2.5	W
	T_A=70°C		1.6	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	°C

Thermal Characteristics					
Parameter		**Symbol**	**Typ**	**Max**	**Units**
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	16.7	25	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		40	50	°C/W
Maximum Junction-to-Case [C]	Steady-State	$R_{\theta JC}$	1.9	2.5	°C/W

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied

■ *ELECTRICAL CHARACTERISTICS(T_A=25℃ Unless otherwise noted)*

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250uA	-60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250uA	-1.0		-2.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-60V, V_{GS}=0			-1	uA
		V_{DS}=-60V, V_{GS}=0 T_J=85℃			-5	
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=-10V, I_D= -20 A		16	20	mΩ
		V_{GS}= -4.5V,I_D= -20 A		20	23	
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	I_S= -1 A, V_{GS}=0V		0.7	1.3	V
Dynamic Parameters						
Q_g	Total Gate Charge	V_{DS}= -30V V_{GS}= -10V I_D=-20 A		53		nC
Q_{gs}	Gate-Source Charge			12		
Q_{gd}	Gate-Drain Charge			13		
C_{iss}	Input Capacitance	V_{DS}= -30V V_{GS}=0V f=1MHz		1886		pF
C_{oss}	Output Capacitance			540		
C_{rss}	Reverse Transfer Capacitance			240		
$T_{d(on)}$	Turn-On Time	V_{DS}= -30V R_L=1.50Ω V_{GEN}=-10V R_G=3.0Ω		19		nS
T_r				15		
$T_{d(off)}$	Turn-Off Time			52		
T_f				17		

Note: 1. Pulse test: pulse width<=300uS, duty cycle<=2%

2.Static parameters are based on package level with recommended wire bonding

■ *TYPICAL CHARACTERISTICS (25℃ Unless Note)*

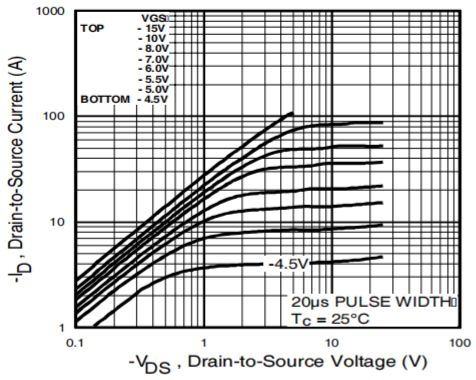


Fig 1. Typical Output Characteristics

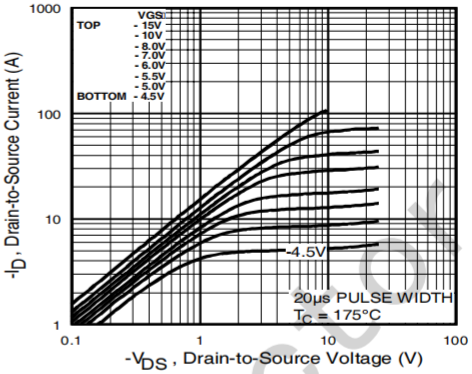


Fig 2. Typical Output Characteristics

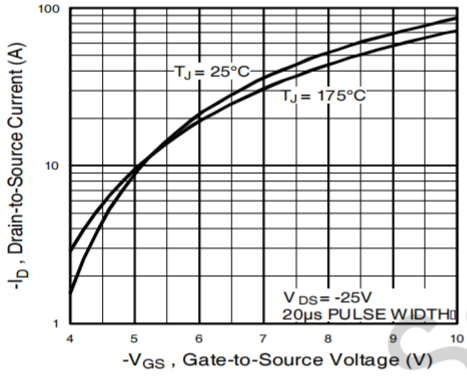


Fig 3. Typical Transfer Characteristics

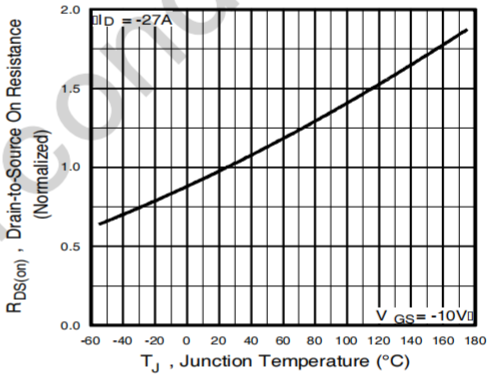


Fig 4. Normalized On-Resistance Vs. Temperature

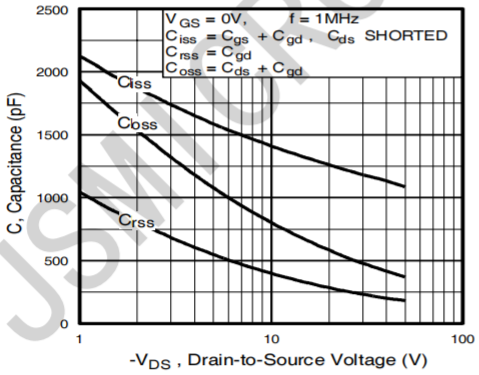


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

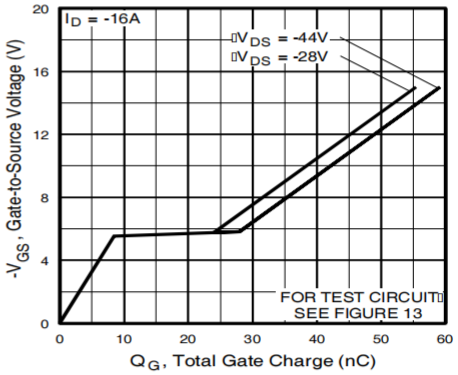


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

■ *TYPICAL CHARACTERISTICS (continuous)*

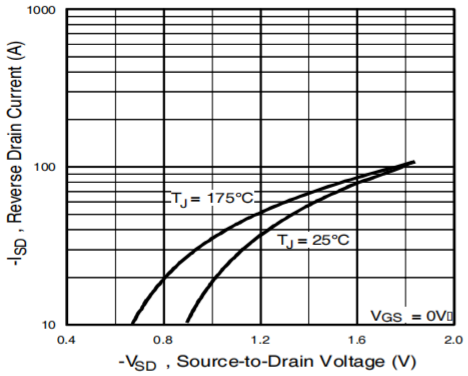


Fig 7. Typical Source-Drain Diode Forward Voltage

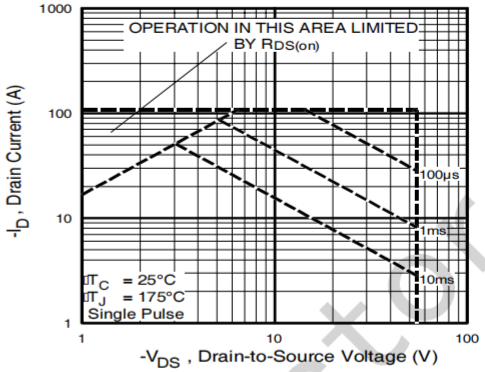


Fig 8. Maximum Safe Operating Area

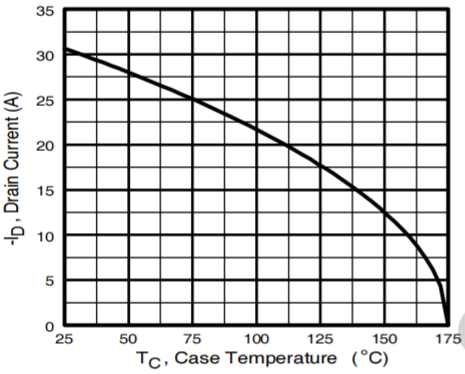


Fig 9. Maximum Drain Current Vs. Case Temperature

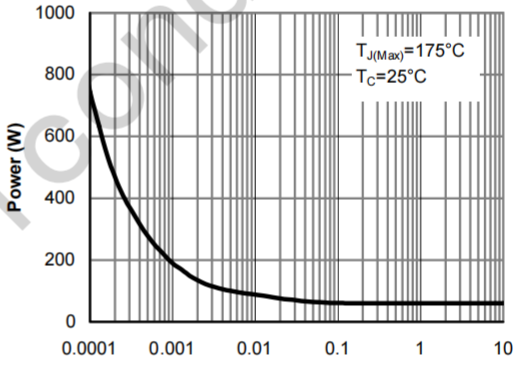
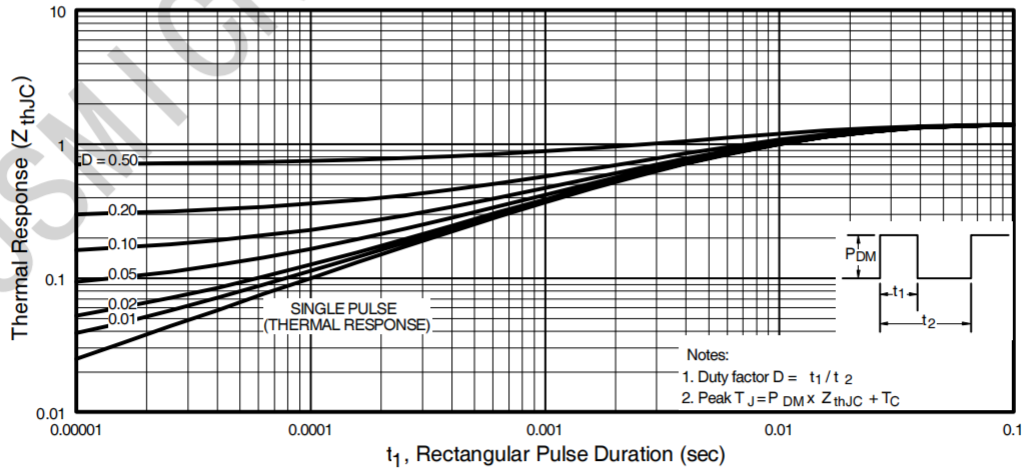
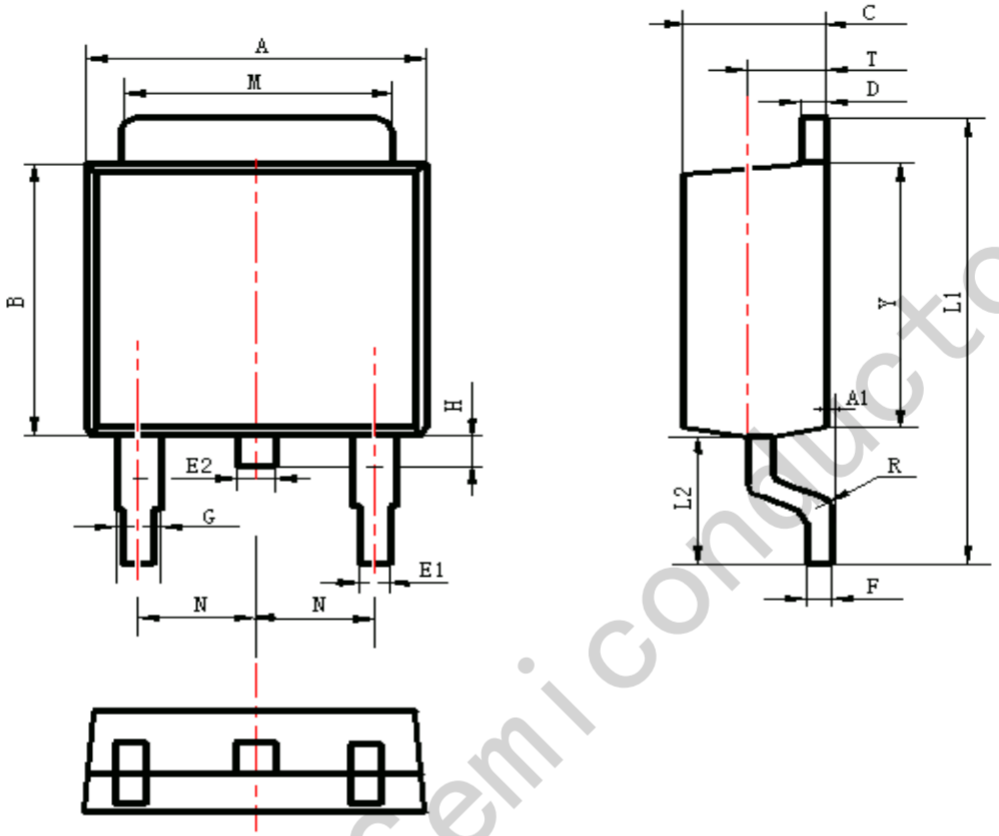


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)



Package Information

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.30	6.90	0.248	0.272
A1	0.00	0.16	0.000	0.006
B	5.70	6.30	0.224	0.248
C	2.10	2.50	0.083	0.098
D	0.30	0.70	0.012	0.028
E1	0.60	0.90	0.024	0.035
E2	0.70	1.00	0.028	0.039
F	0.30	0.60	0.012	0.024
G	0.70	1.20	0.028	0.047
L1	9.60	10.50	0.378	0.413
L2	2.70	3.10	0.106	0.122
H	0.40	1.00	0.016	0.039
M	5.10	5.50	0.201	0.217
N	2.09	2.49	0.082	0.098
R	0.30		0.012	
T	1.40	1.60	0.055	0.063
Y	5.10	6.30	0.201	0.248