TM614DA
DUAL N-CHANNEL ENHANCEMENT MOSFET

General Description

The TM614DA uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V while retaining a 10V $V_{GS(MAX)}$ rating. This device is suitable for use as a uni-directional or bi-directional load switch.

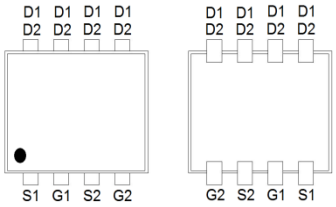
Product Summary

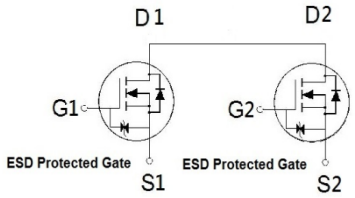
V_{DS}	20V
I_D (at V_{GS}=4.5V)	10.5A
$R_{DS(ON)}$ (at V_{GS} =4.5V)	< 11.8mΩ

100% UIS Tested
100% R_g Tested

Green Product

J-Lead / ECH8





ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±10	V
Continuous Drain Current[2]	T_A = 25 °C	I_D	10.5	A
	T_A = 70 °C		8.4	
Pulsed Drain Current[1]		I_{DM}	28	
Avalanche Current		I_{AS}	22	
Avalanche Energy	L = 0.1mH	E_{AS}	24	mJ
Power Dissipation[3]	T_A = 25 °C	P_D	2.1	W
	T_A = 70 °C		1.3	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE		SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	t ≦10s	$R_{\theta JA}$		58	°C / W
Junction-to-Ambient	Steady-State	$R_{\theta JA}$		73	

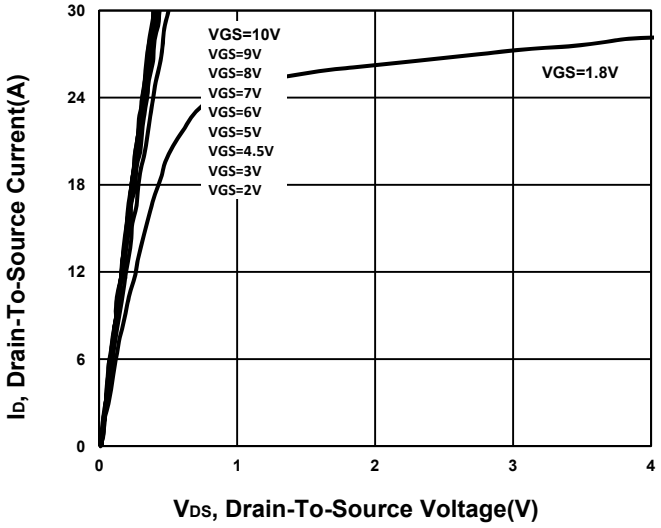
[1]Pulse width limited by maximum junction temperature.
[2]Package limitation current is 7A.
[3]The Power dissipation is based on $R_{\theta JA}$ t ≦10s value.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

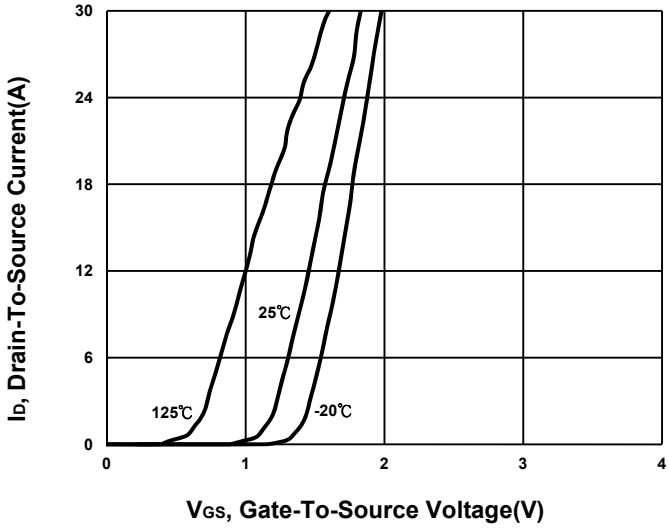
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.35	0.7	1	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±8V			±30	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16V, V_{GS} = 0V			1	μA
		V_{DS} = 10V, V_{GS} = 0V, T_J = 70 °C			10	μA
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 2.5V, I_D = 3A	8.5	13	20	mΩ
		V_{GS} = 3.1V, I_D = 3A	7.8	11.5	15.3	mΩ
		V_{GS} = 3.8V, I_D = 3A	7.2	10.6	12.9	mΩ
		V_{GS} = 4.5V, I_D = 3A	7.1	10	11.8	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 3A		40		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz		1133		pF
Output Capacitance	C_{oss}			214		pF
Reverse Transfer Capacitance	C_{rss}			168		pF
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.5		Ω
Total Gate Charge[2]	Q_g	V_{DS} = 10V , V_{GS} = 4.5V, I_D = 3A		17.4		nC
Gate-Source Charge[2]	Q_{gs}			1.1		nC
Gate-Drain Charge[2]	Q_{gd}			5.1		nC
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 10V , I_D ≅ 3A, V_{GS} = 4.5V, R_G = 6 Ω		24		nS
Rise Time[2]	t_r			32		nS
Turn-Off Delay Time[2]	$t_{d(off)}$			66		nS
Fall Time[2]	t_f			35		nS
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I_S				1.7	A
Forward Voltage[1]	V_{SD}	I_F = 3A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 3A, dI_F/dt = 100A / μS		14		nS
Reverse Recovery Charge	Q_{rr}			5.4		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Pulse width limited by maximum junction temperature.

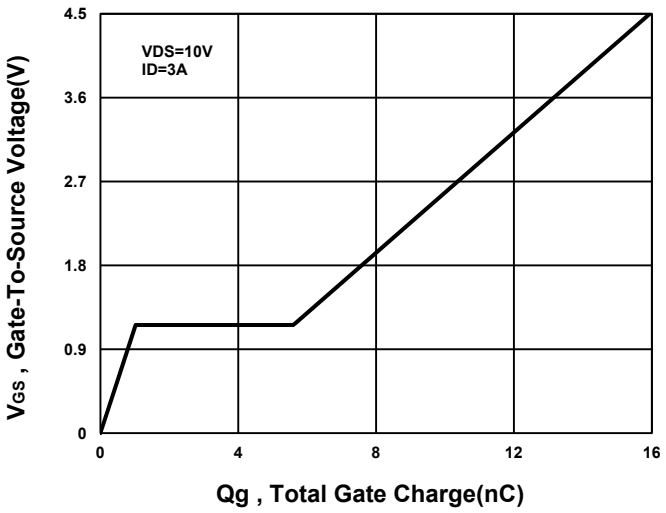
Output Characteristics



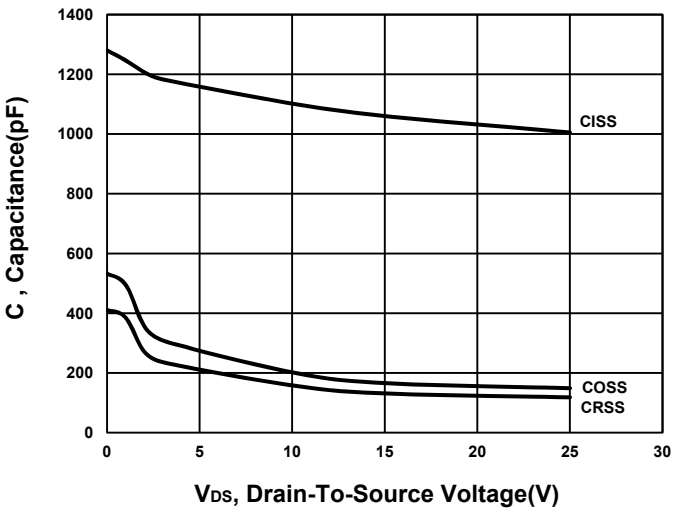
Transfer Characteristics



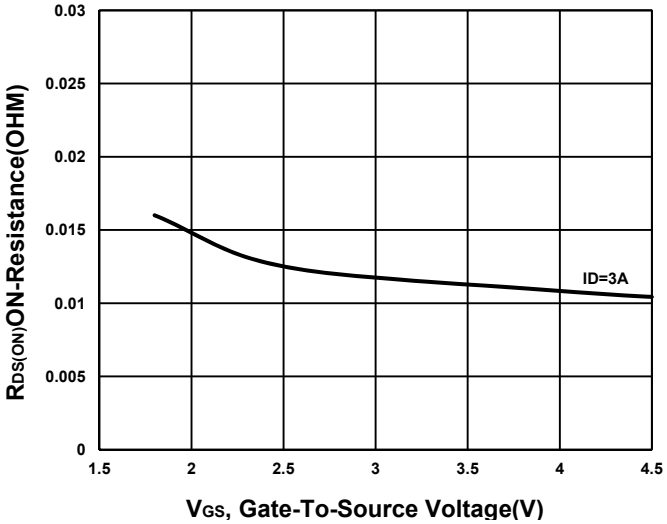
Gate charge Characteristics



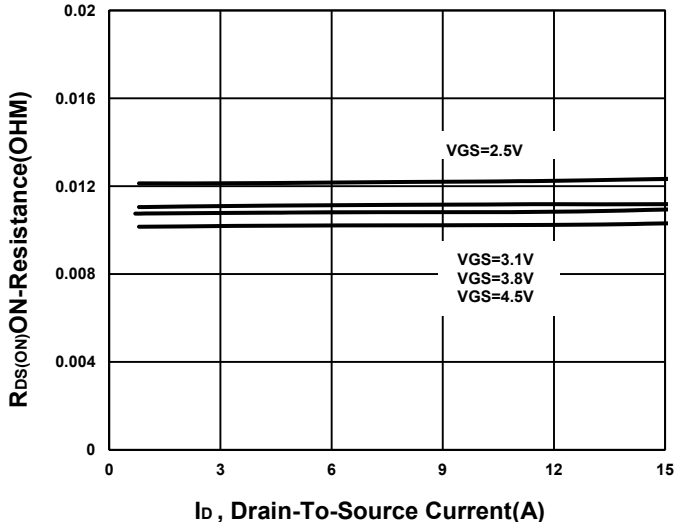
Capacitance Characteristic



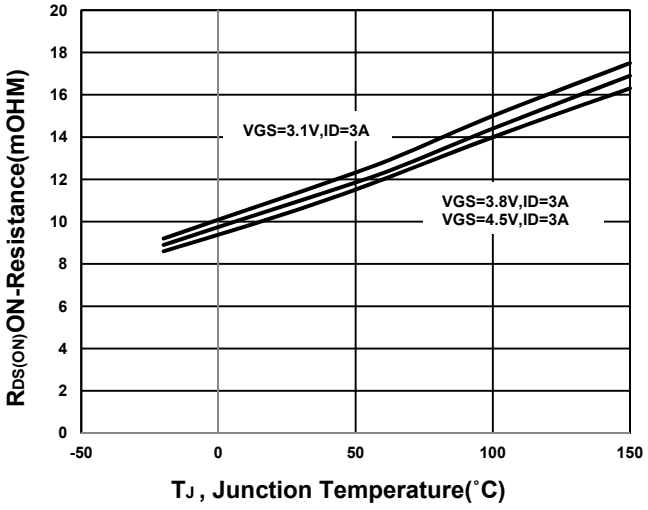
On-Resistance VS Gate-To-Source



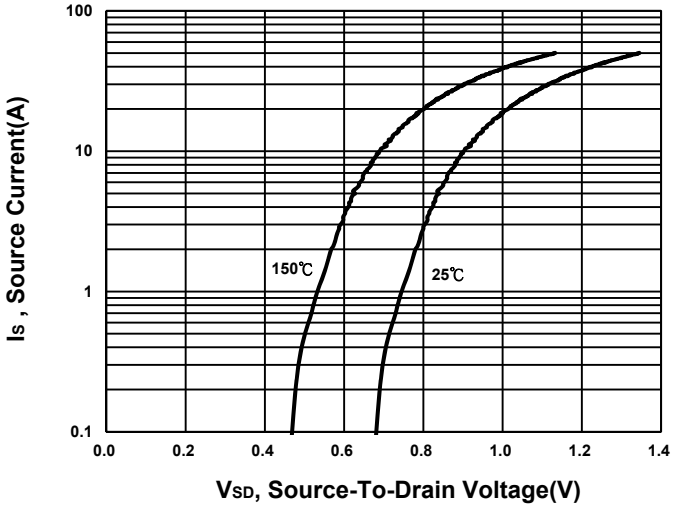
On-Resistance VS Drain Current



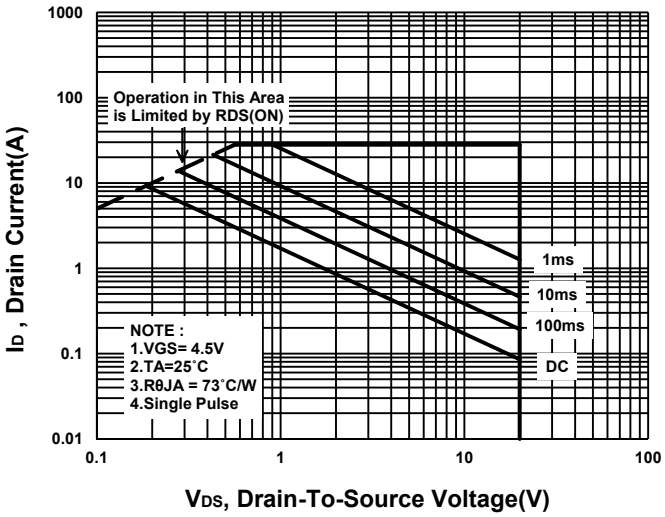
On-Resistance VS Temperature



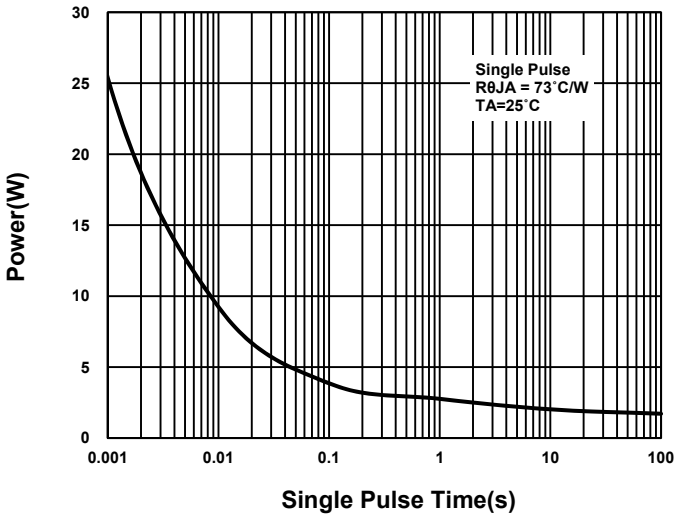
Source-Drain Diode Forward Voltage



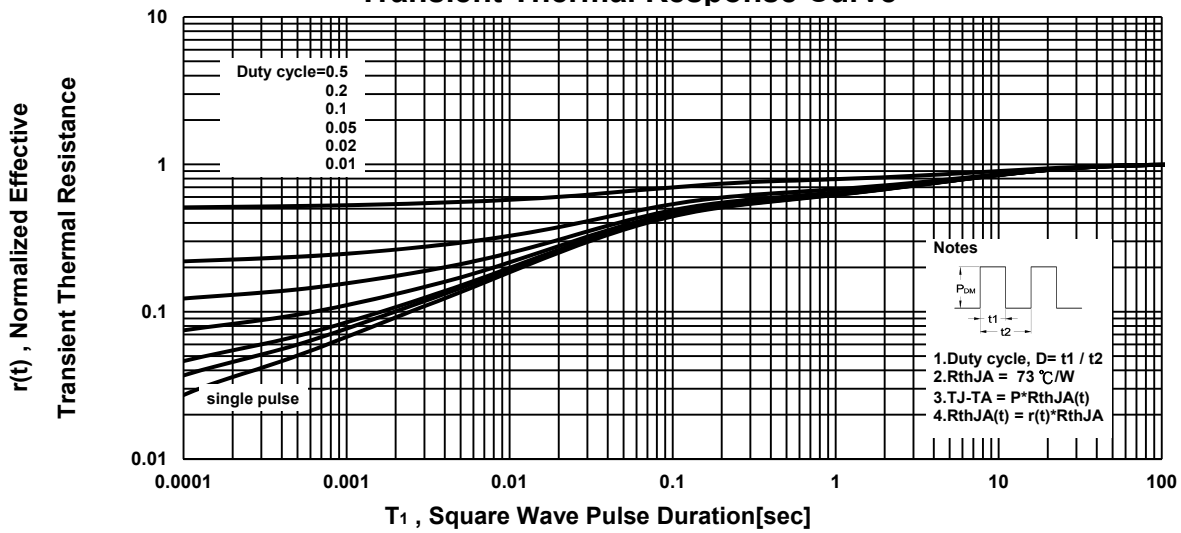
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



Package Dimension

J-Lead MECHANICAL DATA

Dimension	mm			Dimension	Mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	2.95	3.05	3.1	H	0.3	0.45	0.6
B	2.3	2.4	2.5	J		7°	
C	2.65	2.85	3.05	K		0.04	
D	0.25	0.32	0.4	L	0.1	0.15	0.2
E		0.65		M	0°	4°	8°
F	0.92		1.0				
G	0.01		0.1