

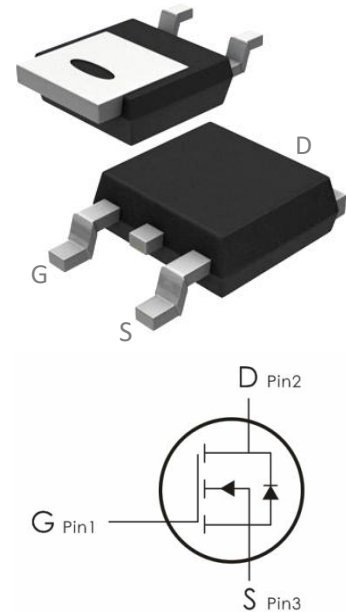
Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=20V, I_D=45A, R_{DS(on)} < 8m\Omega @ V_{GS}=4.5V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current	45	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	28	
I_{DM}	Pulsed Drain Current	130	A
P_D	Power Dissipation	45	W
E_{AS}	Single pulse avalanche energy (Note 5)	180	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case (Note 2)	3.2	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DOD424	D424	TO-252

Electrical Characteristics: ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	20	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =20V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 12V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	0.5	0.7	1.2	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =4.5V, I _D =20A	---	6.3	8	m Ω
		V _{GS} =2.5V, I _D =10A	---	8.5	13	m Ω
G _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A	10	---	---	S
Dynamic Characteristics (Note 4)						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz	---	1540	---	pF
C _{oss}	Output Capacitance		---	210	---	
C _{rss}	Reverse Transfer Capacitance		---	200	---	
Switching Characteristics (Note 4)						
t _{d(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =10V, R _L =0.5Ω, R _{GEN} =3Ω	---	4.5	---	ns
t _r	Rise Time		---	9.2	---	ns
t _{d(off)}	Turn-Off Delay Time		---	18.7	---	ns
t _f	Fall Time		---	3.3	---	ns
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =20A	---	23.5	---	nC
Q _{gs}	Gate-Source Charge		---	2.8	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	5.75	---	nC
Drain-Source Diode Characteristics						

I_S	Max. Diode Forward Current ^(Note 2)	----	---	---	30	A
V_{SD}	Diode Forward Voltage ^(Note 3)	V _{GS} =0V, I _S =20A	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I _F =20A, T _J =25°C	---	18	---	ns
Q_{rr}	Reverse Recovery Charge	diF/dt=100A/μs ^(Note 3)	---	9.5	---	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: T_J=25°C, V_{DD}=10V, V_G=10V, L=0.5mH, R_g=25Ω

Typical Characteristics: (T_A=25°C unless otherwise noted)

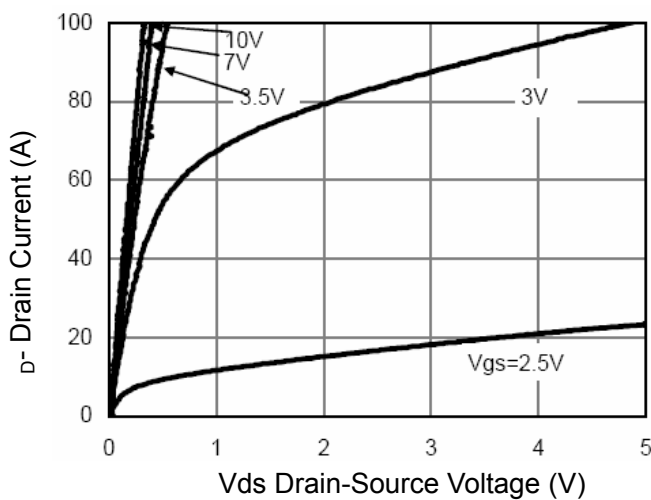


Figure 1 Output Characteristics

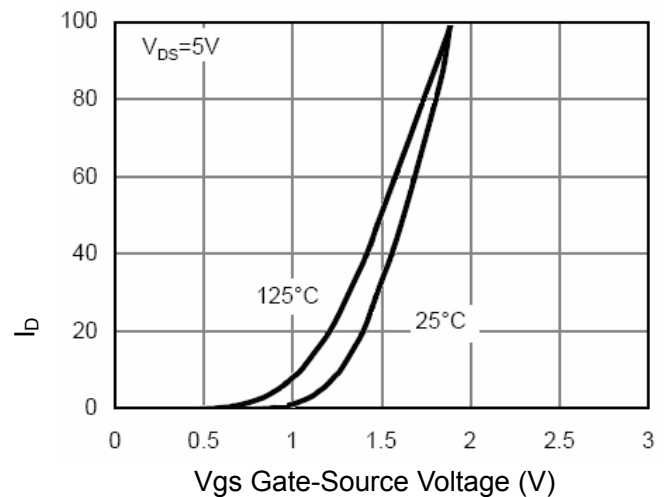


Figure 2 Transfer Characteristics

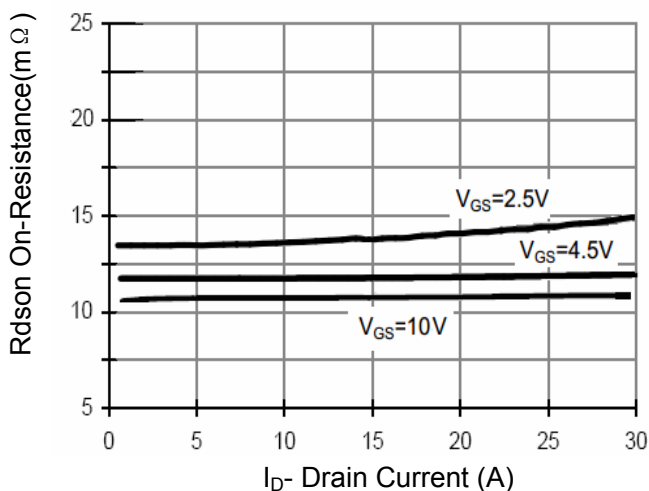


Figure 3 Rdson- Drain Current

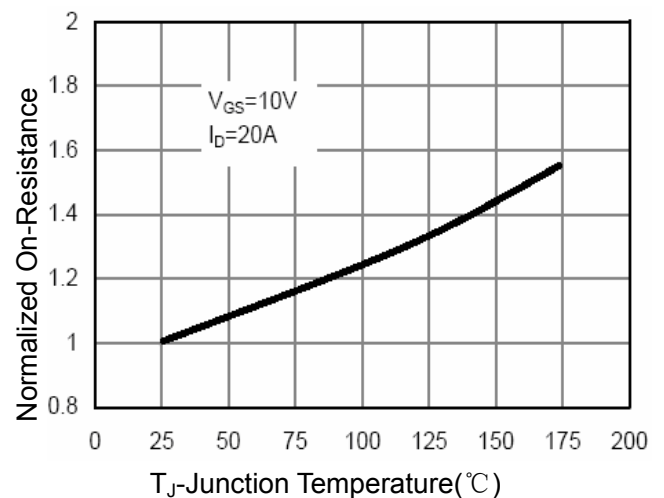
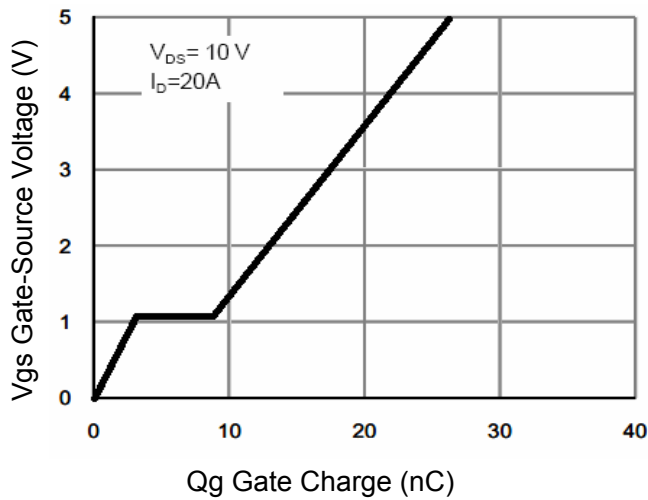
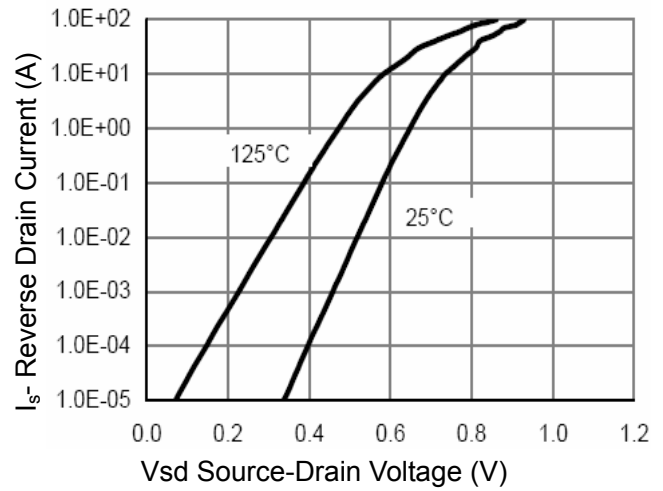
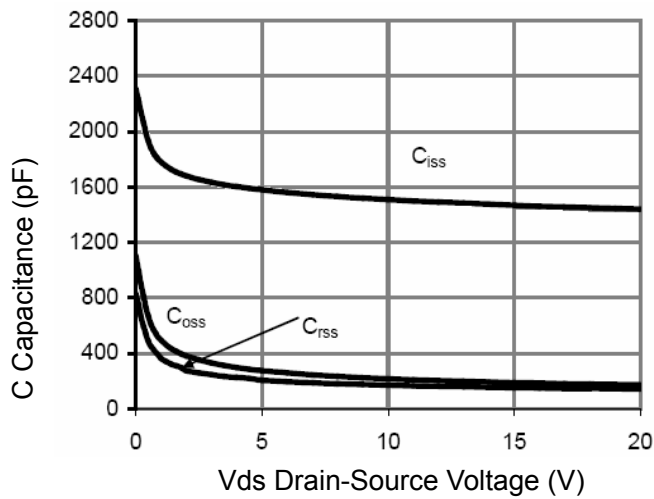
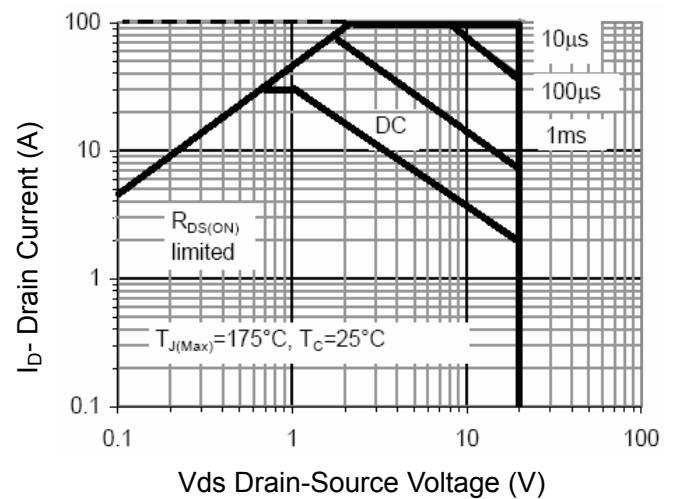
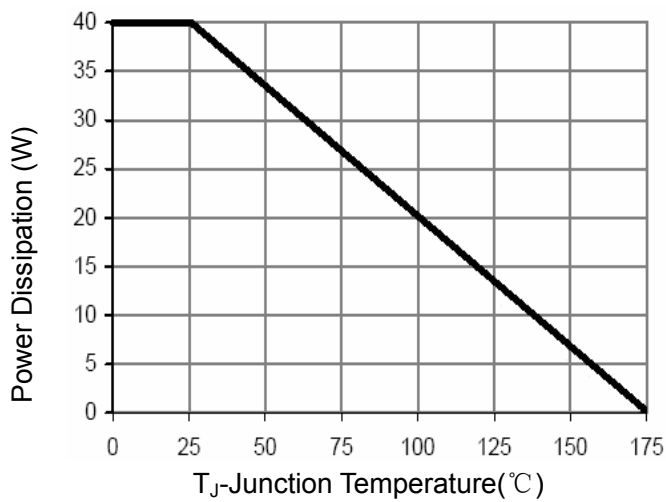
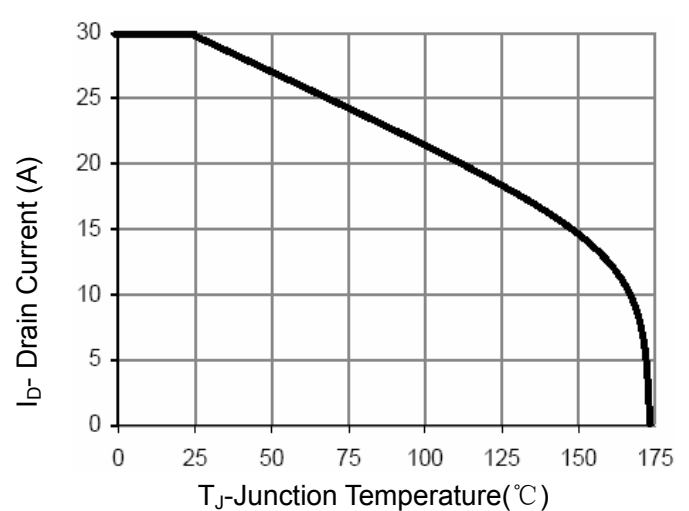


Figure 4 Rdson-Junction Temperature


Figure 5 Gate Charge

Figure 6 Source- Drain Diode Forward

Figure 7 Capacitance vs Vds

Figure 8 Safe Operation Area

Figure 9 Power De-rating

Figure 10 Current De-rating

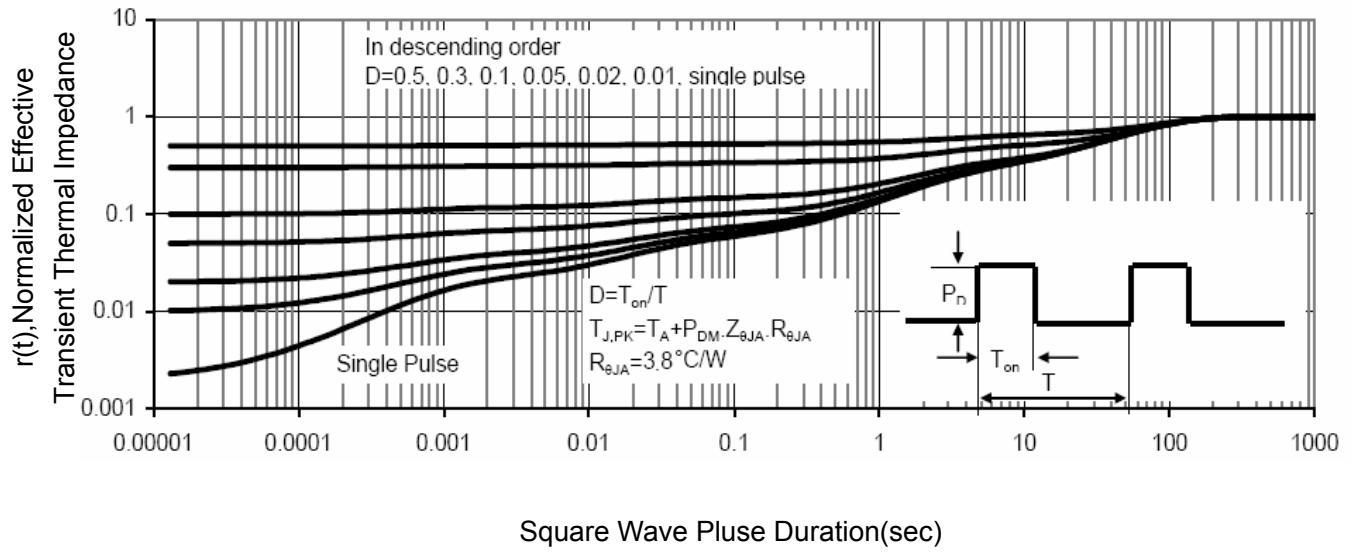


Figure 11 Normalized Maximum Transient Thermal Impedance