

Description:

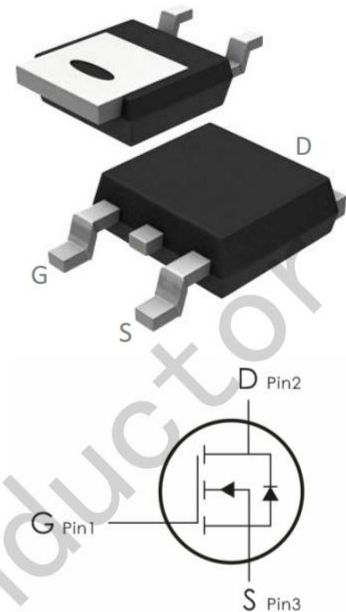
This N-Channel MOSFET uses advanced trench technology and

design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=60V, I_D=60A, R_{DS(ON)} < 12\text{ m}\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 25	V
I_D	Continuous Drain Current- $T_C=25^\circ\text{C}$	60	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	31	
	Pulsed Drain Current ¹	180	
E_{AS}	Single Pulse Avalanche Energy ²	196	mJ
P_D	Power Dissipation, $T_C=25^\circ\text{C}$	68	W
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 ¹	2.2	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ¹	---	

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 25V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	---	3	V
R _{DS(ON)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =40A	---	10.5	12	m Ω
		V _{GS} =4.5V, I _D =0A	---	---	---	
G _{FS}	Forward Transconductance	V _{DS} =10V, I _D =40A	18	---	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	1659	---	pF
C _{oss}	Output Capacitance		---	180	---	
C _{rss}	Reverse Transfer Capacitance		---	128	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ³	V _{DD} =30V, I _D =0A, V _{GS} =10V, R _{GEN} =3Ω	---	15	---	ns
t _r	Rise Time ^{2,3}		---	25	---	ns
t _{d(off)}	Turn-Off Delay Time		---	53	---	ns
t _f	Fall Time ^{2,3}		---	23	---	ns
Q _g	Total Gate Charge ³	V _{GS} =10V, V _{DS} =30V, I _D =15A	---	50	---	nC
Q _{gs}	Gate-Source Charge		---	12	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	23	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ³	V _{GS} =0V, I _S =1A	---	0.89	0.99	V

Ls	Continuous Source Current	---	45	---	A
Ism	Pulsed Source Current		180	---	A
trr	Reverse Recovery Time ³	$T_J=25^{\circ}\text{C}, I_F=15\text{A}$ $di/dt=100\text{A}/\mu\text{s}$	24	---	Ns
qrr	Reverse Recovery Charge ³		30	---	nc

Notes:

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature
- 2.EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=30\text{V}$, $V_G=10\text{V}$, $R_G=25\ \Omega$
- 3 Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1.5\%$, Starting $T_J=25^{\circ}\text{C}$

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

Figure1. Output Characteristics

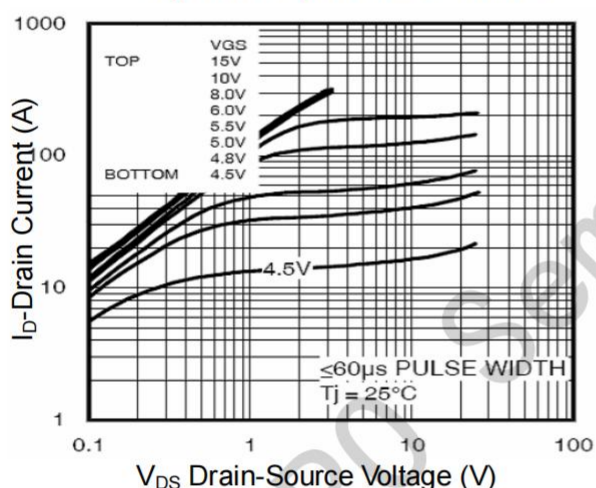


Figure2. Transfer Characteristics

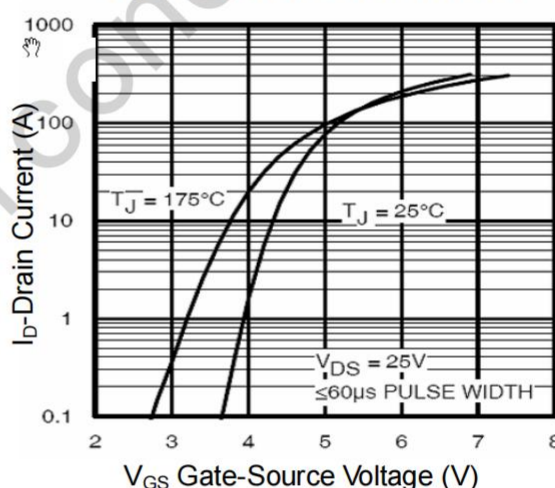


Figure3. BVDSS vs Junction Temperature

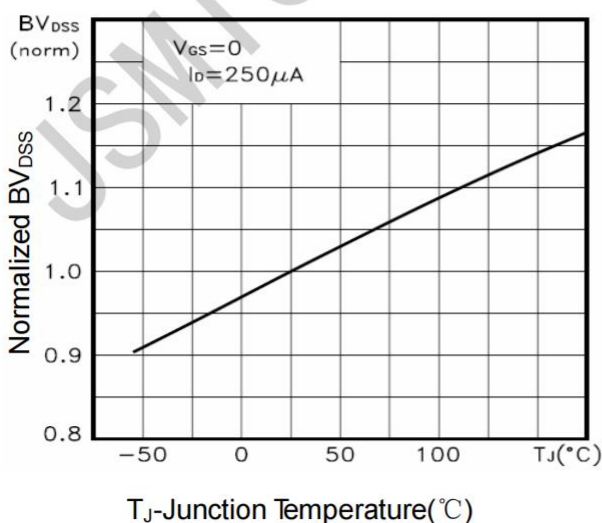


Figure4. ID vs Junction Temperature

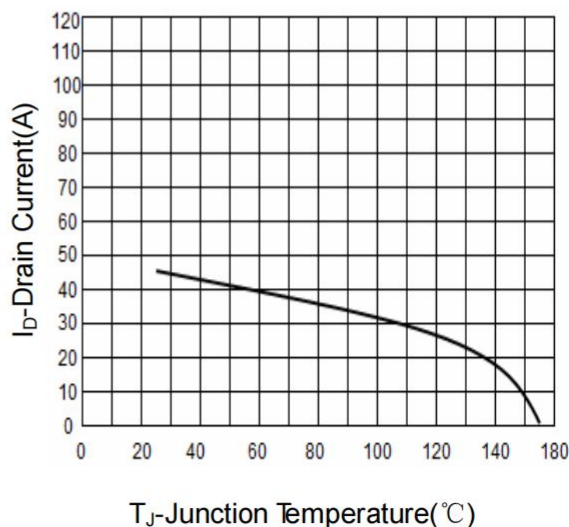


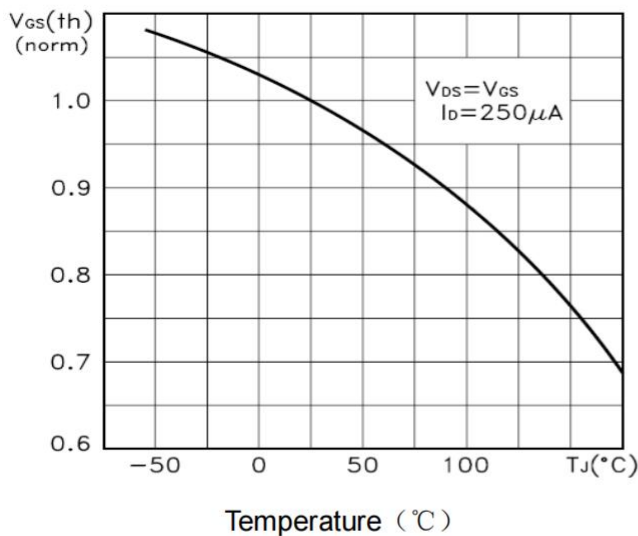
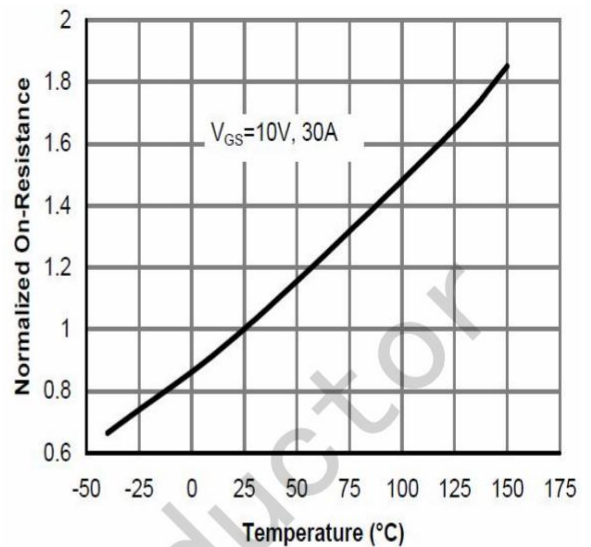
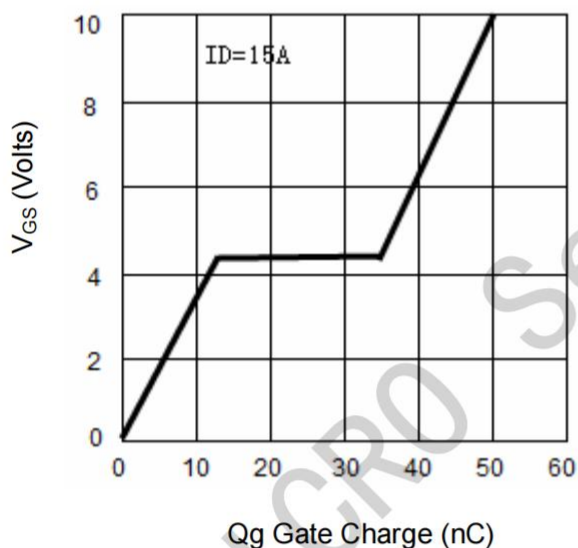
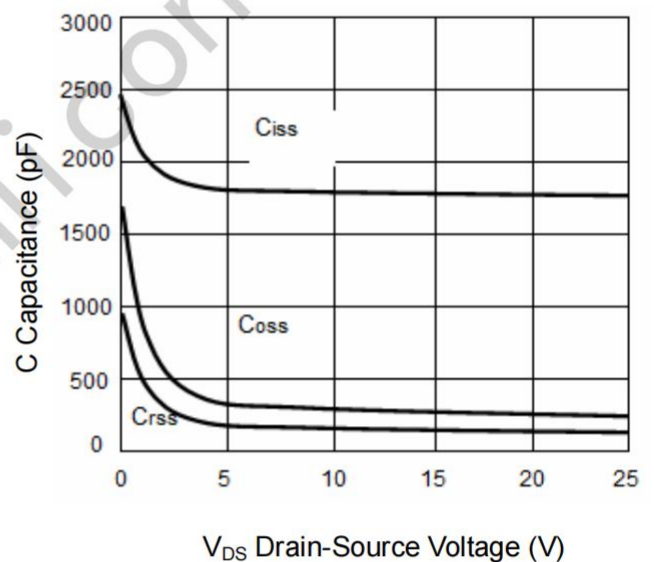
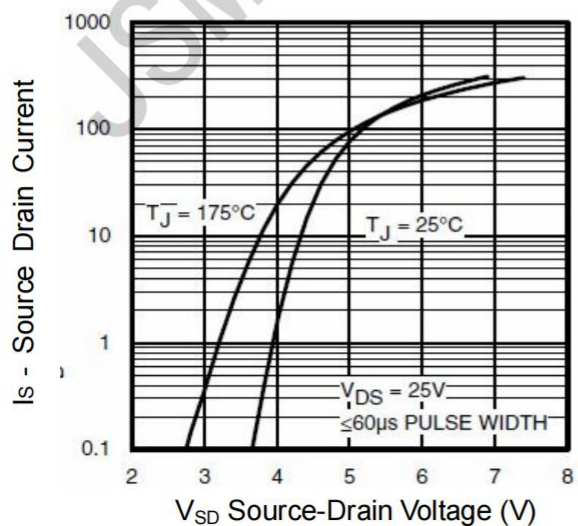
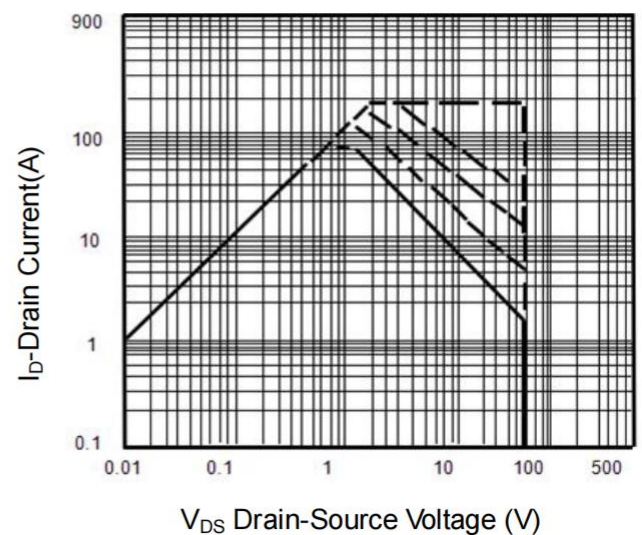
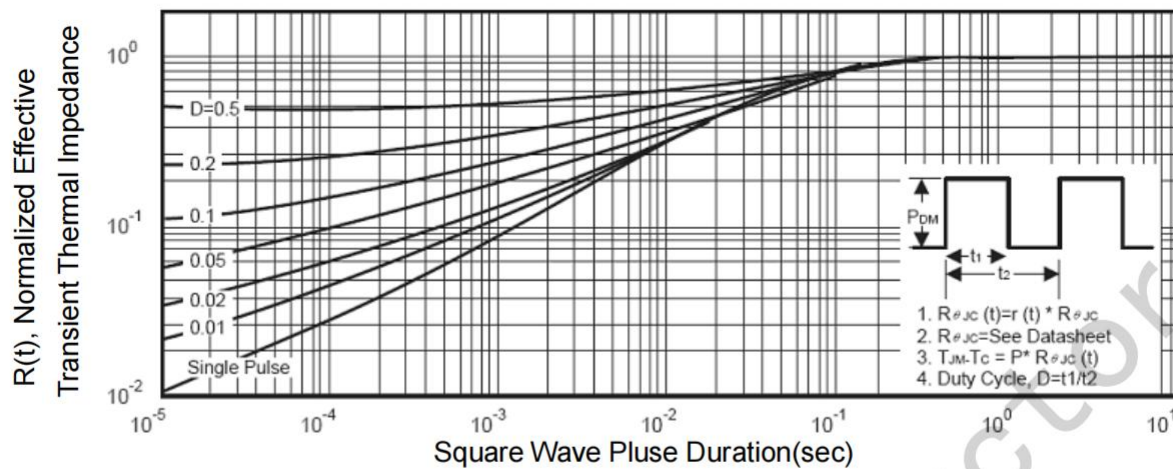
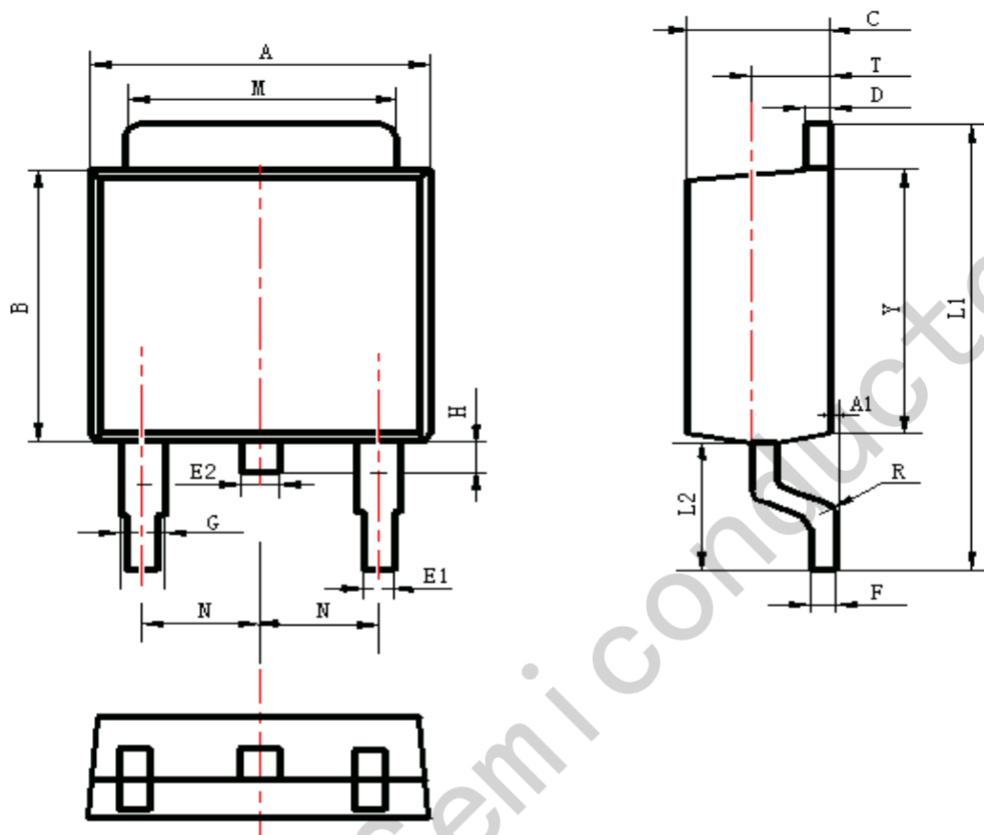
Figure5. VGS(th) vs Junction Temperature

Figure6. Rdson Vs Junction Temperature

Figure7. Gate Charge

Figure8. Capacitance vs Vds

Figure9. Source- Drain Diode Forward

Figure10. Safe Operation Area


Figure11. Normalized Maximum Transient Thermal Impedance



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