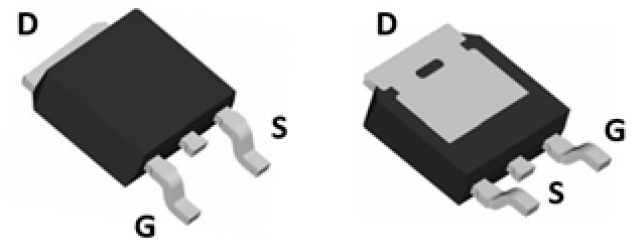
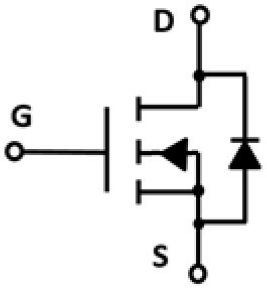
N-Channel Enhancement Mode Field Effect Transistor



TO-252



Product Summary

- V_{DS} 30V
- I_D 80A
- $R_{DS(ON)}$(at V_{GS}= 10V) ＜6.5mohm
- $R_{DS(ON)}$(at V_{GS}= 5V) ＜10mohm

Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

■ **Absolute Maximum Ratings** (T_A=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	30	V
Gate-source Voltage	V_{GS}	±20	V
Drain Current	I_D	80	A
Pulsed Drain Current [A]	I_{DM}	170	A
Single Pulse Avalanche Energy [B]	E_{AS}	306	mJ
Total Power Dissipation	P_D	83	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.74	℃/ W
Junction and Storage Temperature Range	T_J ,T_{STG}	-55～+150	℃

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=30A		4.5	6.5	mΩ
		V_{GS}= 5V, I_D=24A		6.8	10	
Diode Forward Voltage	V_{SD}	I_S=24A,V_{GS}=0V			1.3	V
Maximum Body-Diode Continuous Current	I_S				80	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHZ		2015		pF
Output Capacitance	C_{oss}			250		
Reverse Transfer Capacitance	C_{rss}			230		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=10V,I_D=30A		61		nC
Gate-Source Charge	Q_{gs}			8.2		
Gate-Drain Charge	Q_{gd}			7.8		
Reverse Recovery Charge	Q_{rr}	I_F=80A, di/dt=100A/us		32		
Reverse Recovery Time	t_{rr}			12		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=10V,R_G=2.7Ω , I_D=30A		20		
Turn-on Rise Time	t_r			15		
Turn-off Delay Time	$t_{D(off)}$			60		
Turn-off fall Time	t_f			10		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
B. E_{AS} condition: Tj=25℃,VDD=15V,VG=10V,L=0.5mH,Rg=25Ω, IAS=35A

■ Typical Performance Characteristics

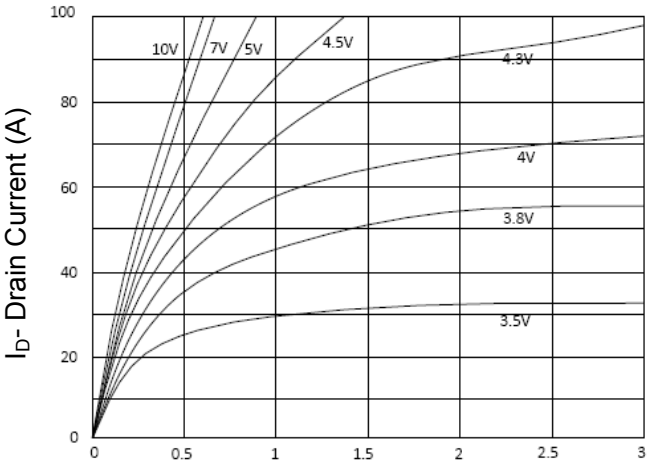


Figure 1 Output Characteristics

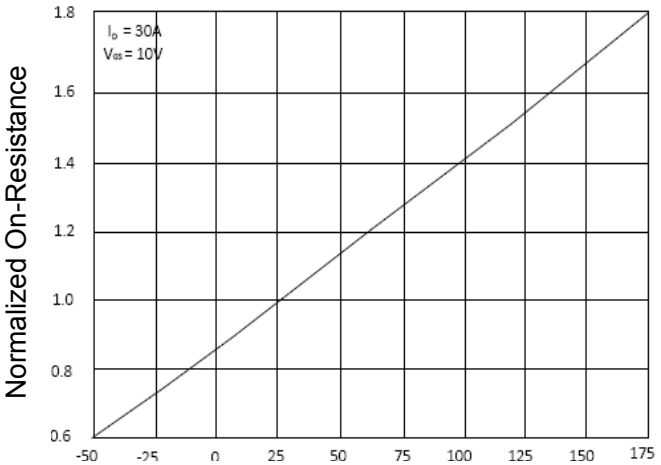


Figure 2 Rdson-JunctionTemperature

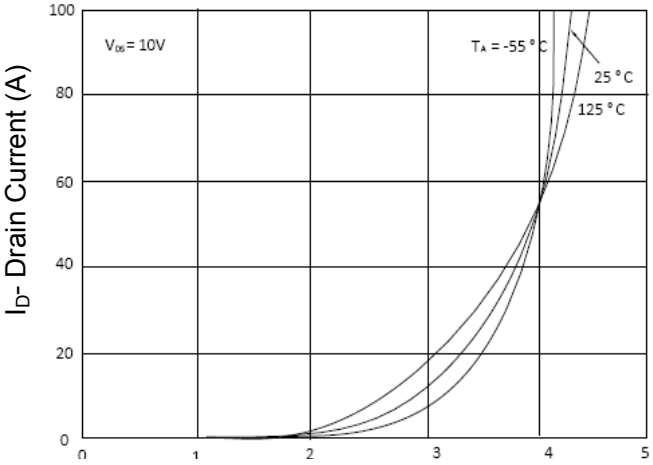


Figure 3 Transfer Characteristics

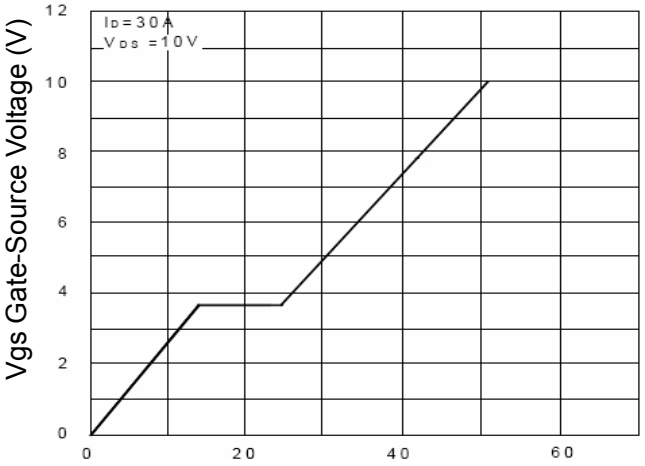


Figure 4 Gate Charge

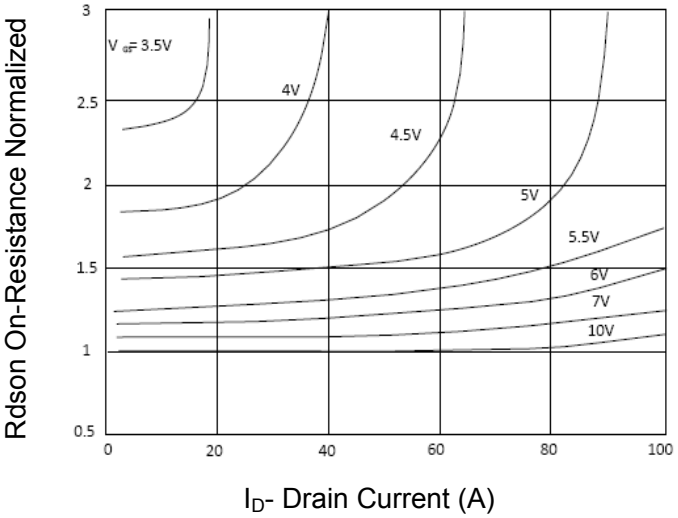


Figure 5 Rdson- Drain Current

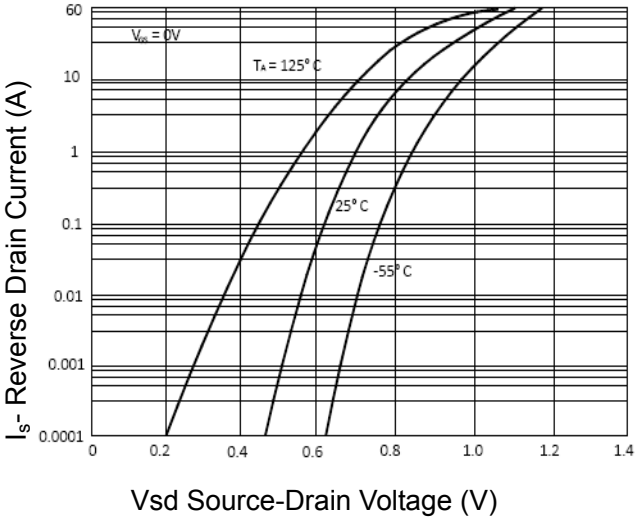


Figure 6 Source- Drain Diode Forward

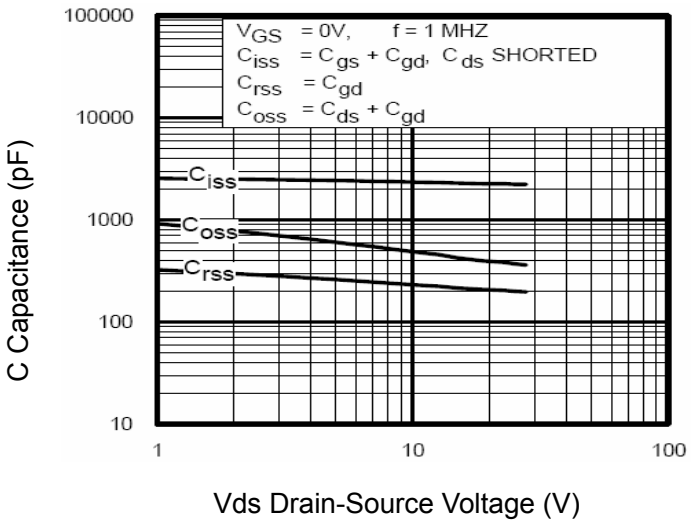


Figure 7 Capacitance vs Vds

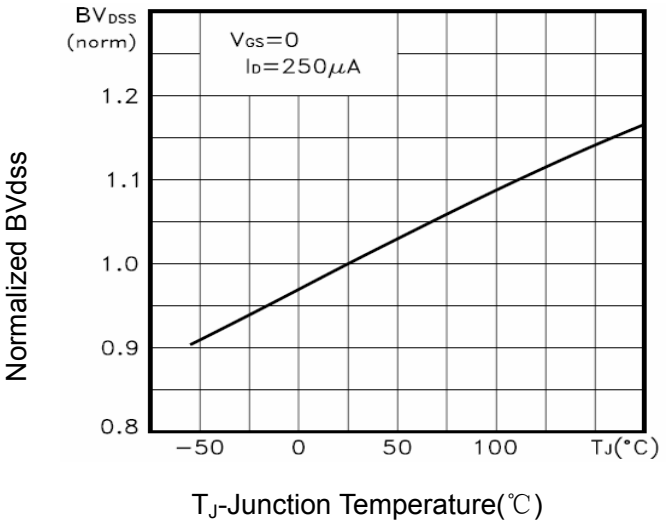


Figure 8 BV_{DSS} vs Junction Temperature

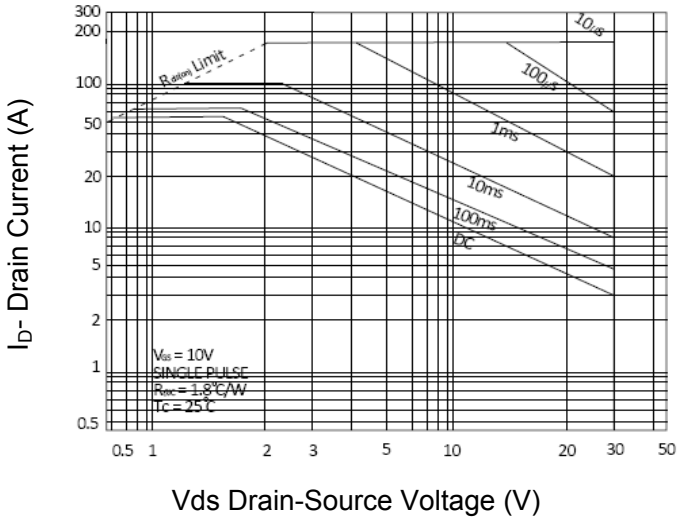


Figure 9 Safe Operation Area

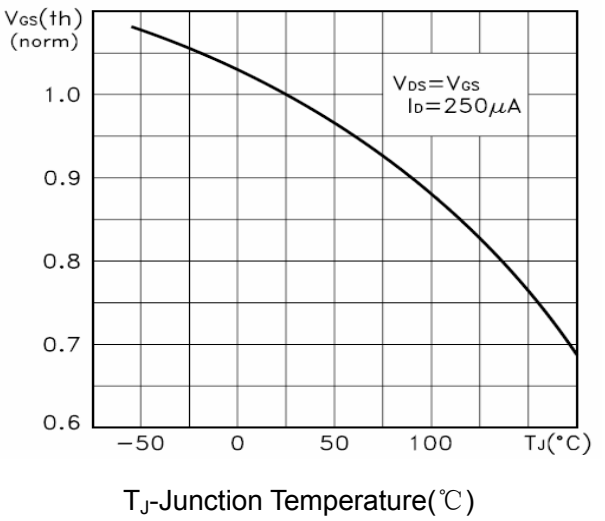
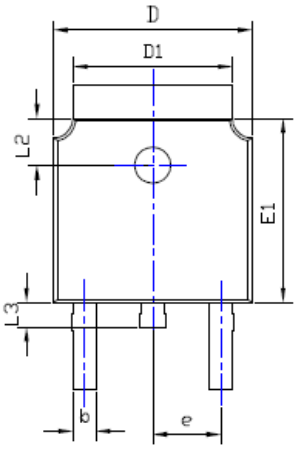
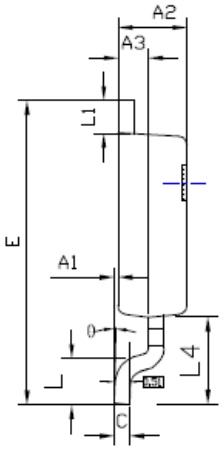


Figure 10 $V_{GS(th)}$ vs Junction Temperature

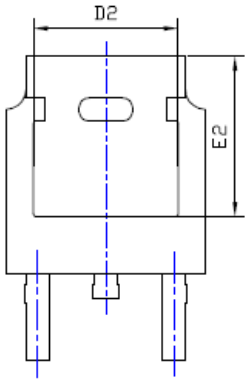
■ TO-252 Package information



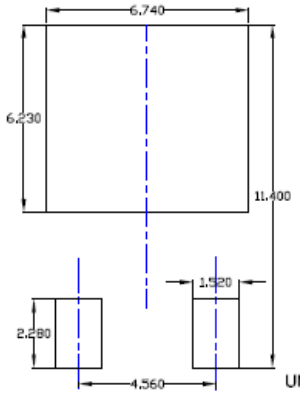
TOP VIEW



SIDE VIEW



BOTTOM VIEW



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS						
SYMBOL	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.008	0.000	---	0.200
A2	0.087	0.091	0.094	2.200	2.300	2.400
A3	0.035	0.039	0.043	0.900	1.000	1.100
b	0.026	0.030	0.034	0.660	0.760	0.860
c	0.018	0.020	0.023	0.460	0.520	0.580
D	0.256	0.260	0.264	6.500	6.600	6.700
D1	0.203	0.209	0.215	5.150	5.300	5.450
D2	0.181	0.189	0.195	4.600	4.800	4.950
E	0.390	0.398	0.406	9.900	10.100	10.300
E1	0.236	0.240	0.244	6.000	6.100	6.200
E2	0.203	0.209	0.215	5.150	5.300	5.450
e	0.090BSC			2.286BSC		
L	0.049	0.059	0.069	1.250	1.500	1.750
L1	0.035	---	0.050	0.900	---	1.270
L2	0.055	---	0.075	1.400	---	1.900
L3	0.240	0.310	0.039	0.600	0.800	1.000
L4	0.114REF			2.900REF		
θ	0°	---	10°	0°	---	10°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.