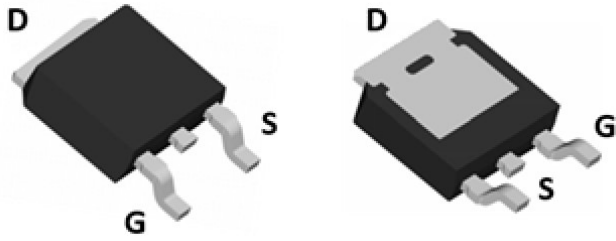
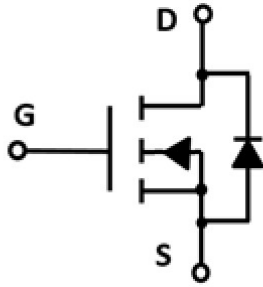


N-Channel Enhancement Mode Field Effect Transistor



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 R_{dson}
- 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 ($T_A=25^{\circ}C$ 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	$^{\circ}C/W$
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^{\circ}C$

■ Electrical Characteristics (T_J=25°C 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 _r =80A, di/dt=100A/us		32		
Reverse Recovery Time	t _{rr}			12		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =10V, R _G =2.7Ω, I _D =30A		20		ns
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: T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=35A

■ Typical Performance Characteristics

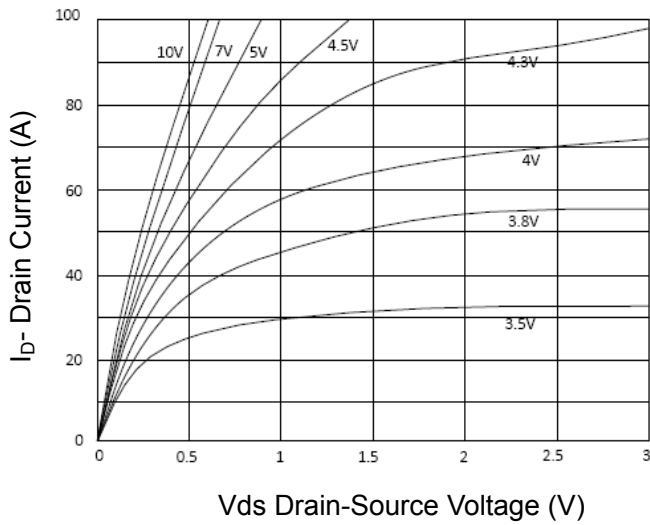


Figure 1 Output Characteristics

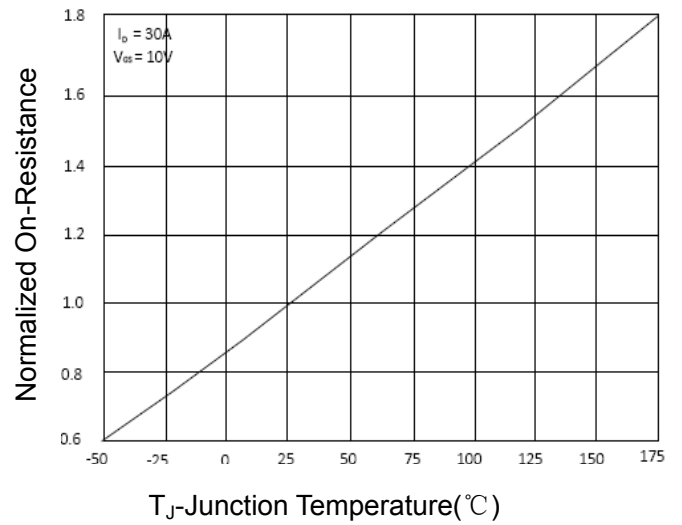


Figure 2 R_{dson} -Junction Temperature

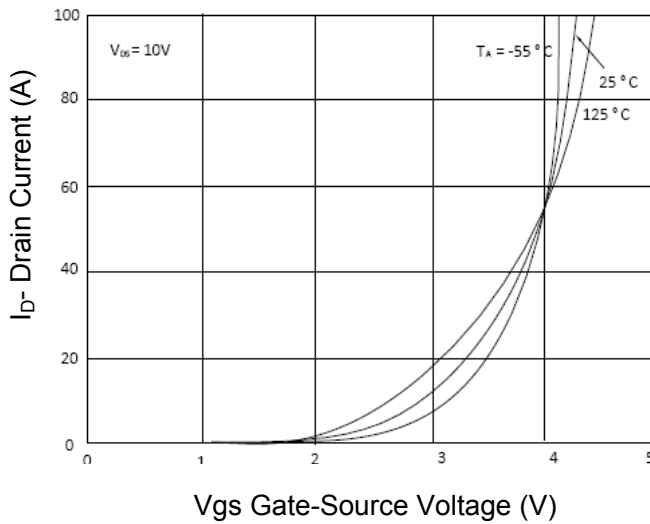


Figure 3 Transfer Characteristics

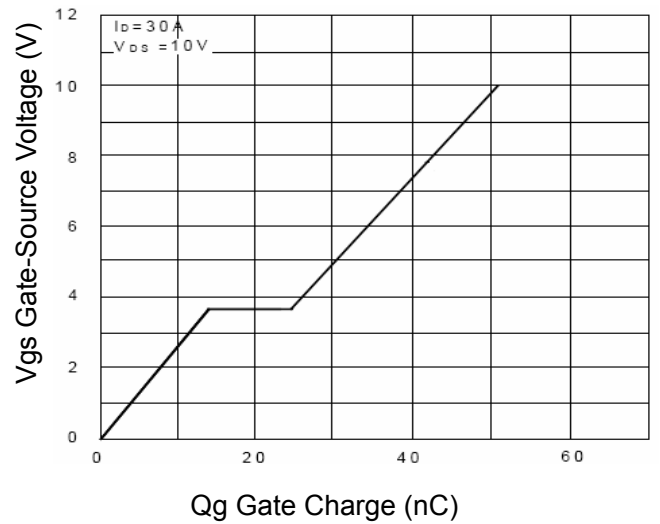


Figure 4 Gate Charge

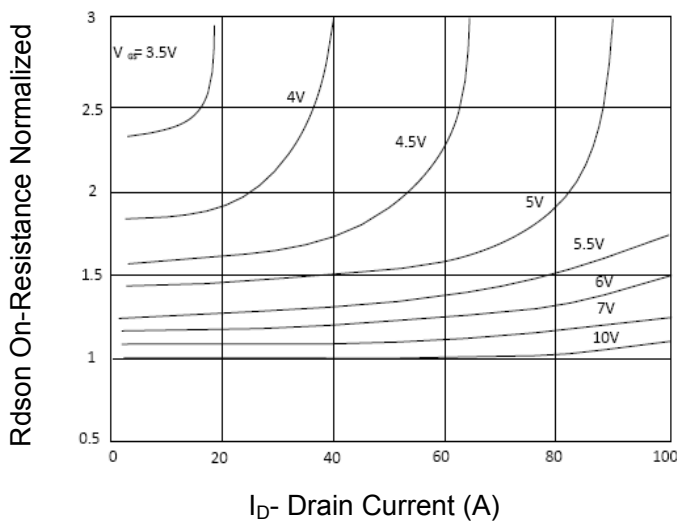


Figure 5 R_{dson} - Drain Current

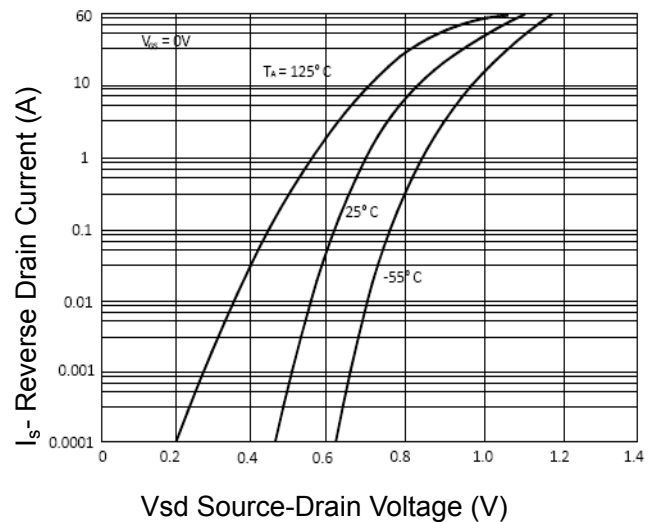
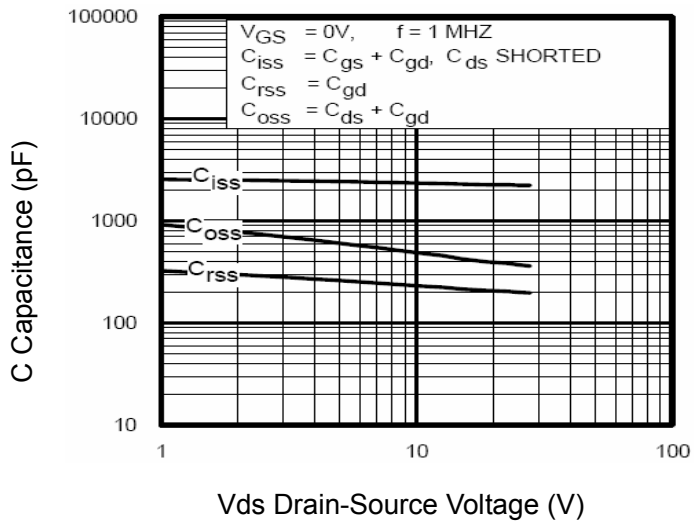
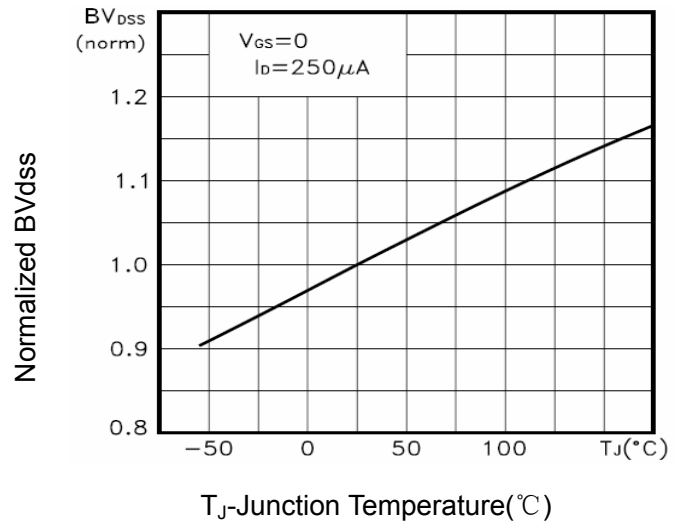


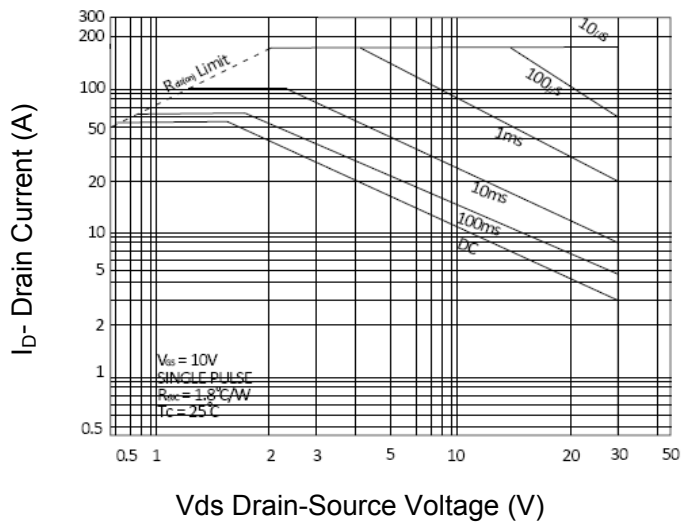
Figure 6 Source- Drain Diode Forward



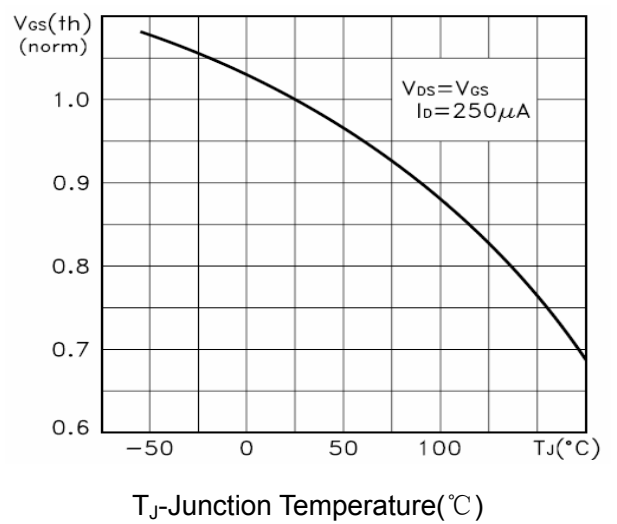
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



T_J-Junction Temperature(°C)
Figure 8 BV_{DSS} vs Junction Temperature

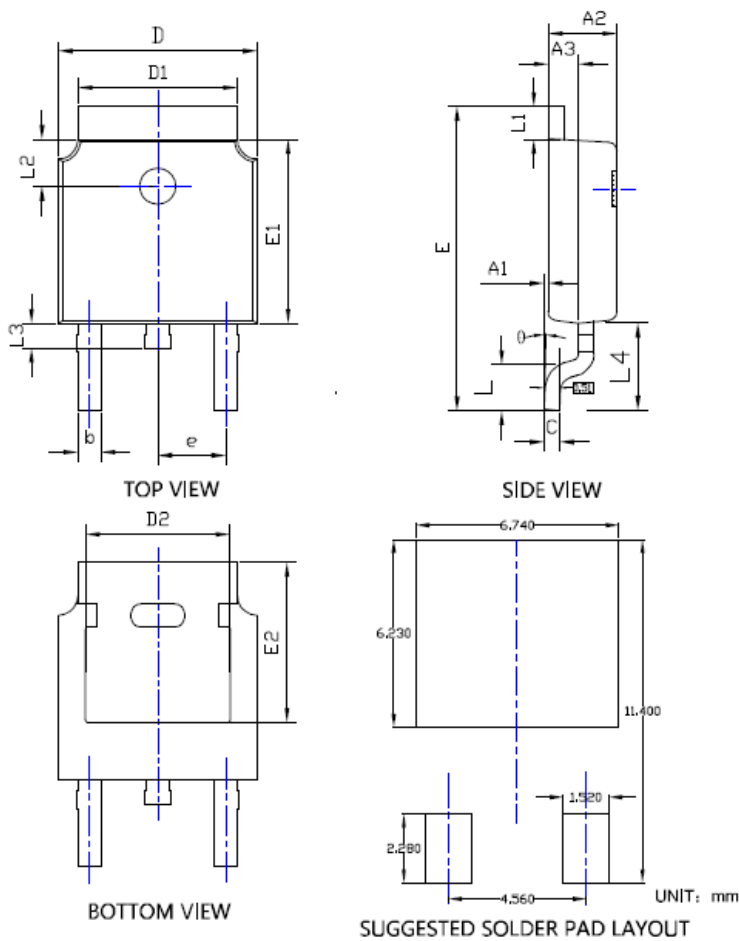


Vds Drain-Source Voltage (V)
Figure 9 Safe Operation Area



T_J-Junction Temperature(°C)
Figure 10 V_{GS(th)} vs Junction Temperature

■ TO-252 Package information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NDM.	MAX.	MIN.	NDM.	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.