Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	12mΩ@10V	30A
	15mΩ@4.5V	

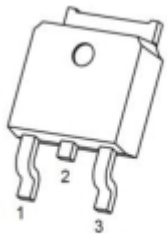
Feature

- Fast Switching
- Extremely low switching loss
- Excellent Rdson and Low Gate Charge

Applications

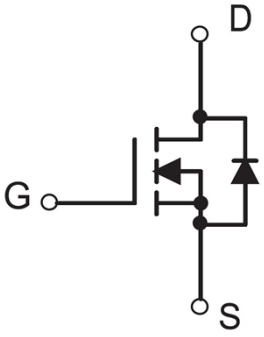
- Power Management
- Switched mode power supply

Package

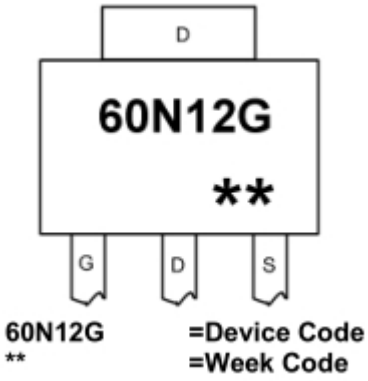


TO-252-2L(G:1 D:2 S:3)

Circuit diagram



Marking



Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current[1], T_C=25 °C	I_D	30	A
Pulsed drain current[2], T_C=25 °C	I_{DM}	120	A
Continuous diode forward current[1], T_C=25 °C	I_S	12	A
Power dissipation[3], T_C=25 °C	P_D	60	W
Single pulsed avalanche energy[4]	E_{AS}	36	mJ
Thermal resistance, junction-case	$R_{\theta JA}$	2.5	°C/W
Operation and storage temperature	T_{STG}, T_J	-55 to 150	°C

Electrical characteristics

(T_A=25℃, unless otherwise noted)

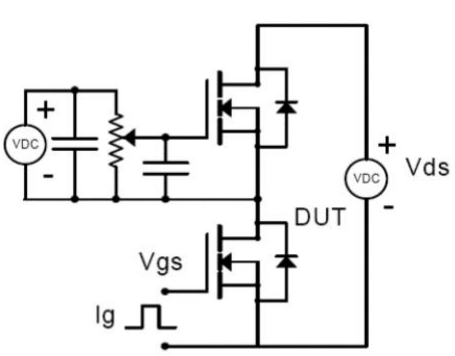
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	60			V
Gate-source leakage current	I_{GSS}	V_{GS} =±20V			±100	uA
Drain-source leakage current	I_{DSS}	V_{DS} =48V, V_{GS} = 0V			1	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		12	16	mΩ
		V_{GS} =4.5V, I_D =10A		15	22	
Dynamic and Switching Characteristics						
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		940		pF
Output capacitance	C_{oss}			235		
Reverse transfer capacitance	C_{rss}			10		
Total gate charge	Q_g	V_{GS}=10V , V_{DS}=30V , I_D =20A		23		pF
Gate-source charge	Q_{gs}			4.8		
Gate-drain charge	Q_{gd}			4.0		
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	V_{GS}=10V, V_{DS}=30V, R_G =1.6Ω, I_D =20A		4.7		nS
Rise Time	T_r			2.9		
Turn-Off Delay Time	$T_{d(off)}$			14		
Fall Time	t_f			2.9		
Drain-Source Body Diode Characteristics						
Diode forward voltage	V_{SD}	V_{GS}=0V ,I_S=1A			1.2	V

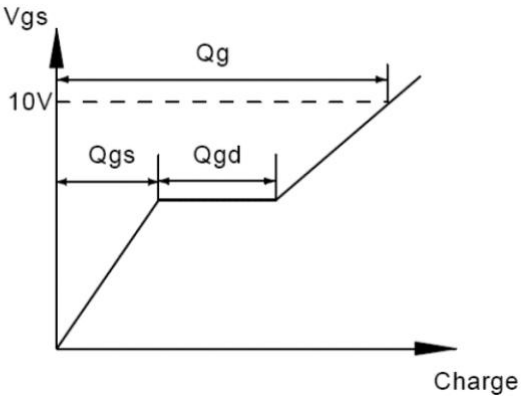
Note：

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Pd is based on max. junction temperature, using junction-case thermal resistance.
4. V_{DD}=30 V,V_{GS}=10 V, L=0.5 mH, starting T_j=25 °C..

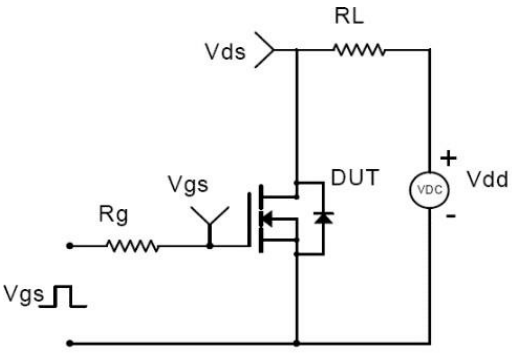
Test circuits and waveforms

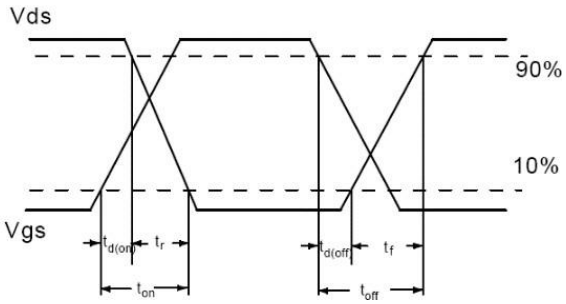
- Gate charge test circuit & waveform



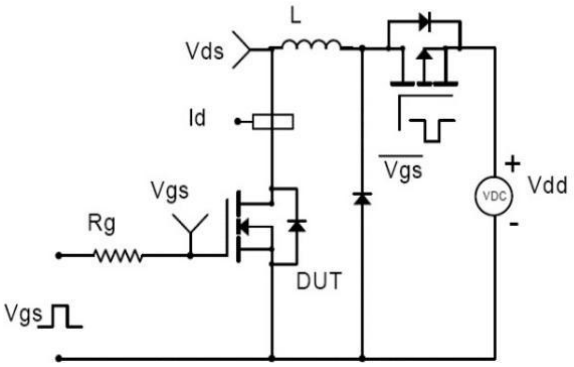


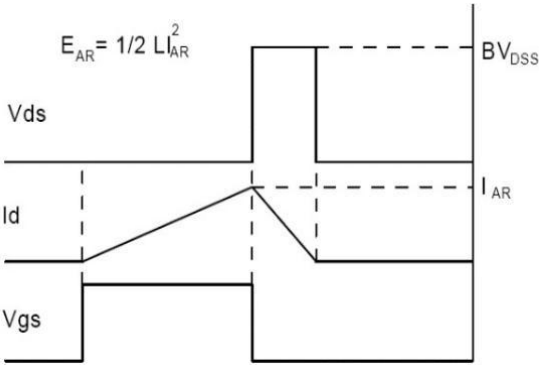
- Switching time test circuit & waveforms



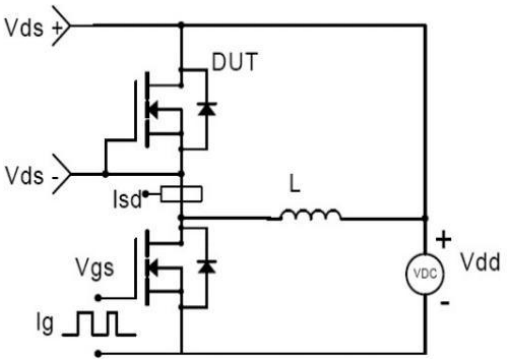


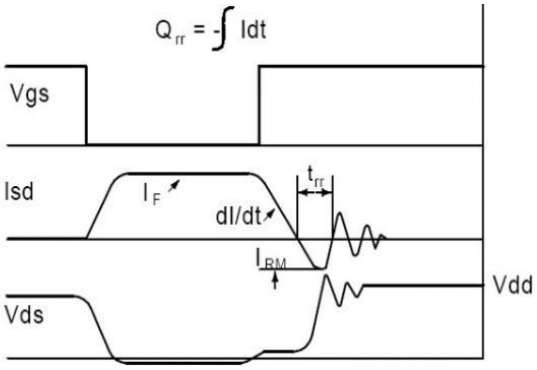
- Unclamped inductive switching (UIS) test circuit & waveforms



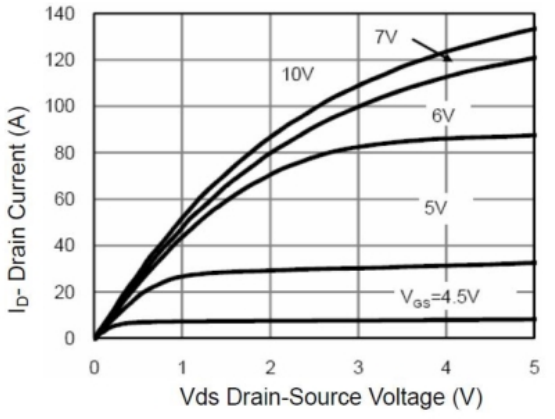


- Diode reverse recovery test circuit & waveforms

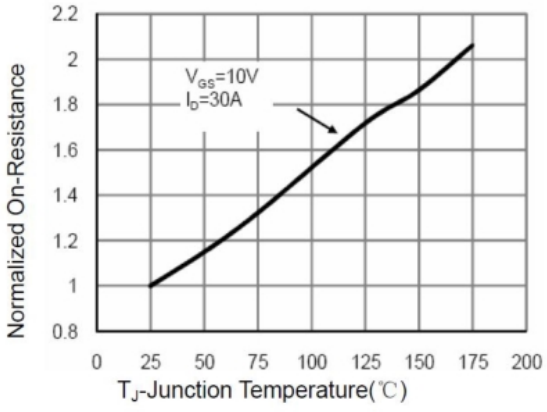




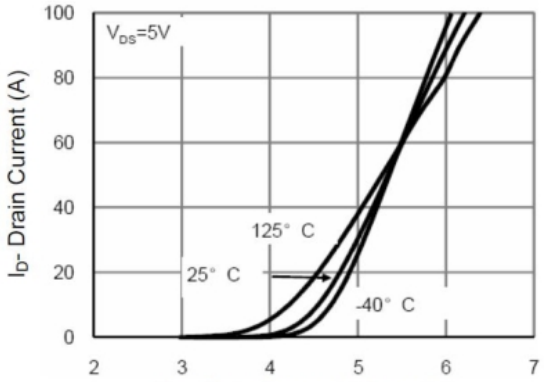
Typical Characteristics



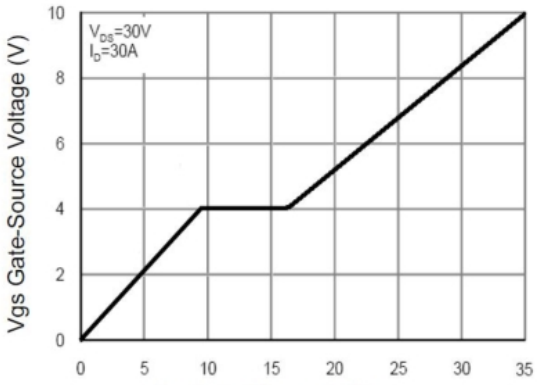
Output Characteristics



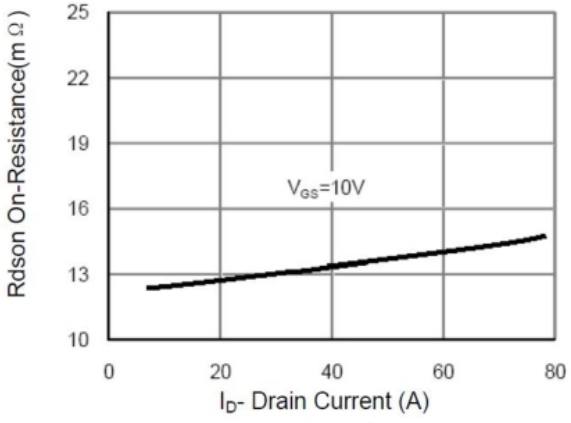
Rdson-JunctionTemperature



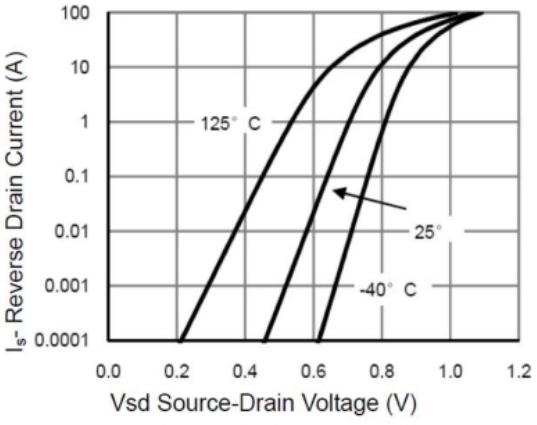
Transfer Characteristics



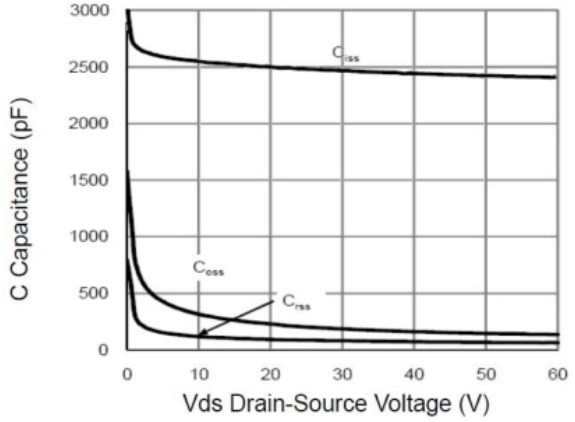
Gate Charge



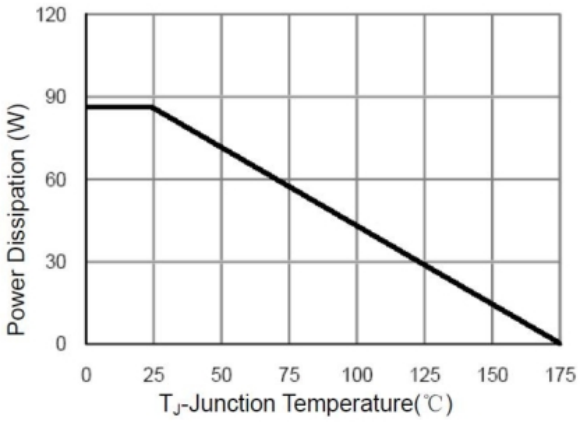
Rdson- Drain Current



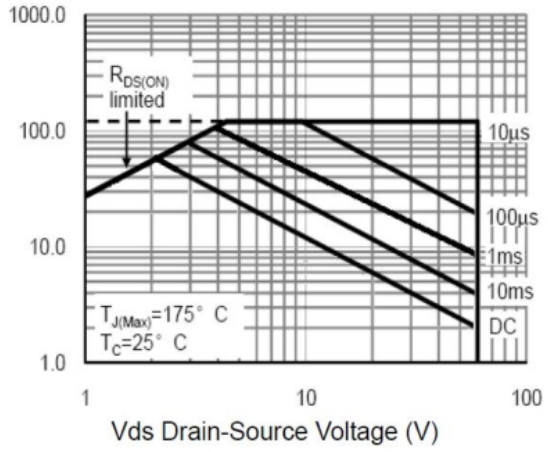
Source- Drain Diode Forward



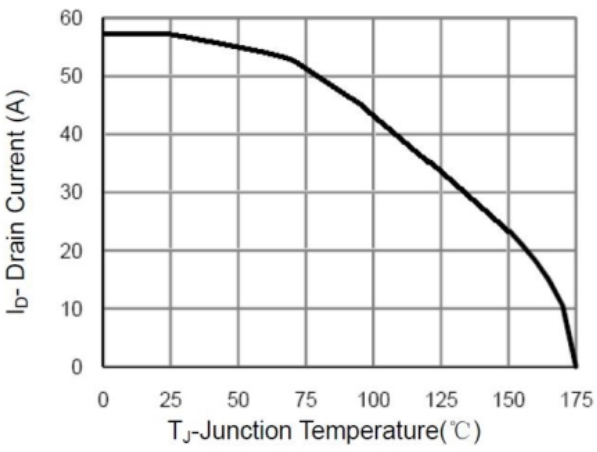
Capacitance vs Vds



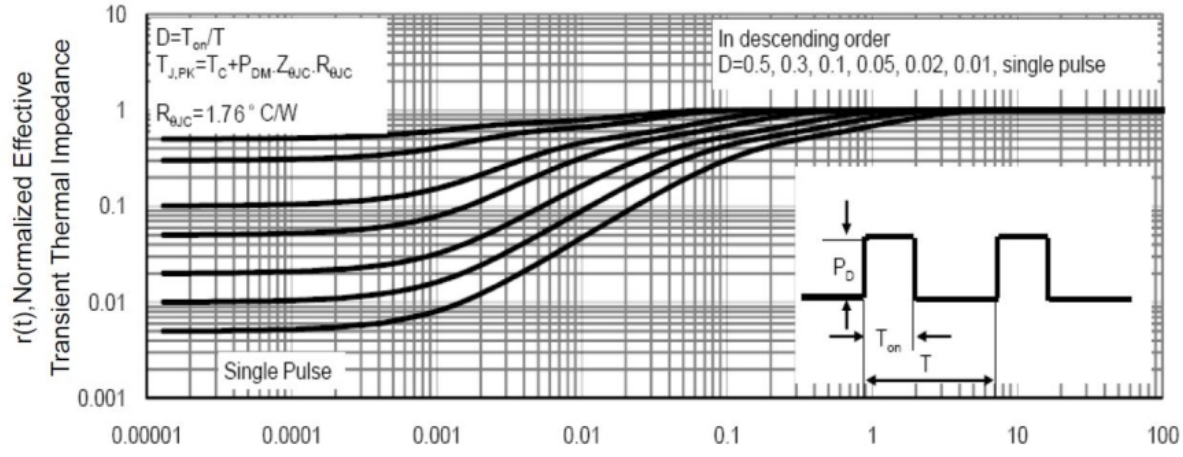
Power De-rating



Safe Operation Area

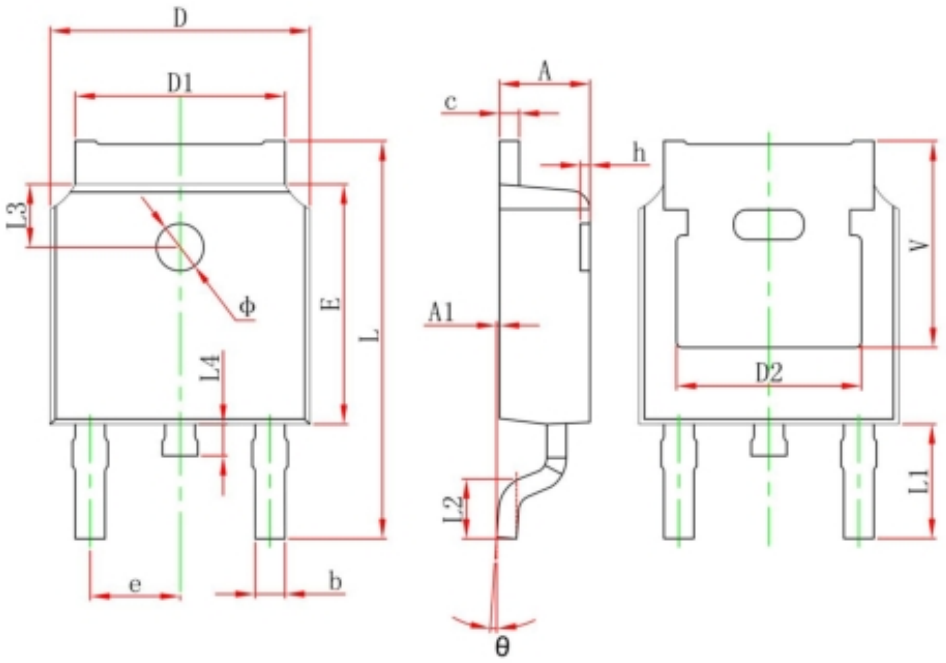


ID Current- JunctionTemperature



Normalized Maximum Transient Thermal Impedance

TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	