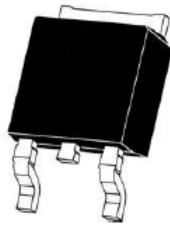


**FEATURE**

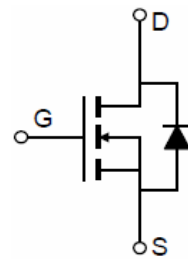
- Low gate charge
- Low Ciss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

**Product Summary**

$V_{DS}$	60	V
$R_{DS(on),Typ} @ V_{GS}=10V$	8.5	m $\Omega$
$I_D$	50	A



TO-252-2L top view



Schematic diagram

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	50	A
Drain Current-Continuous( $T_C=100^\circ\text{C}$ )	$I_D (100^\circ\text{C})$	42	A
Pulsed Drain Current	$I_{DM}$	200	A
Maximum Power Dissipation	$P_D$	62.5	W
Derating factor		0.73	W/ $^\circ\text{C}$
Single pulse avalanche energy <sup>(Note 5)</sup>	$E_{AS}$	31	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ\text{C}$

**Thermal Characteristics**

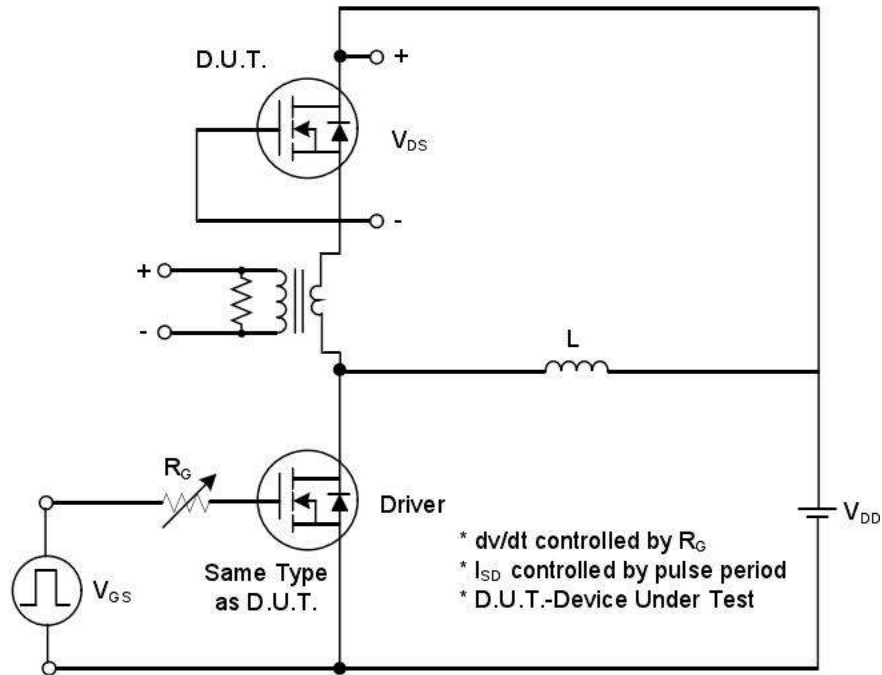
Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.0	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$



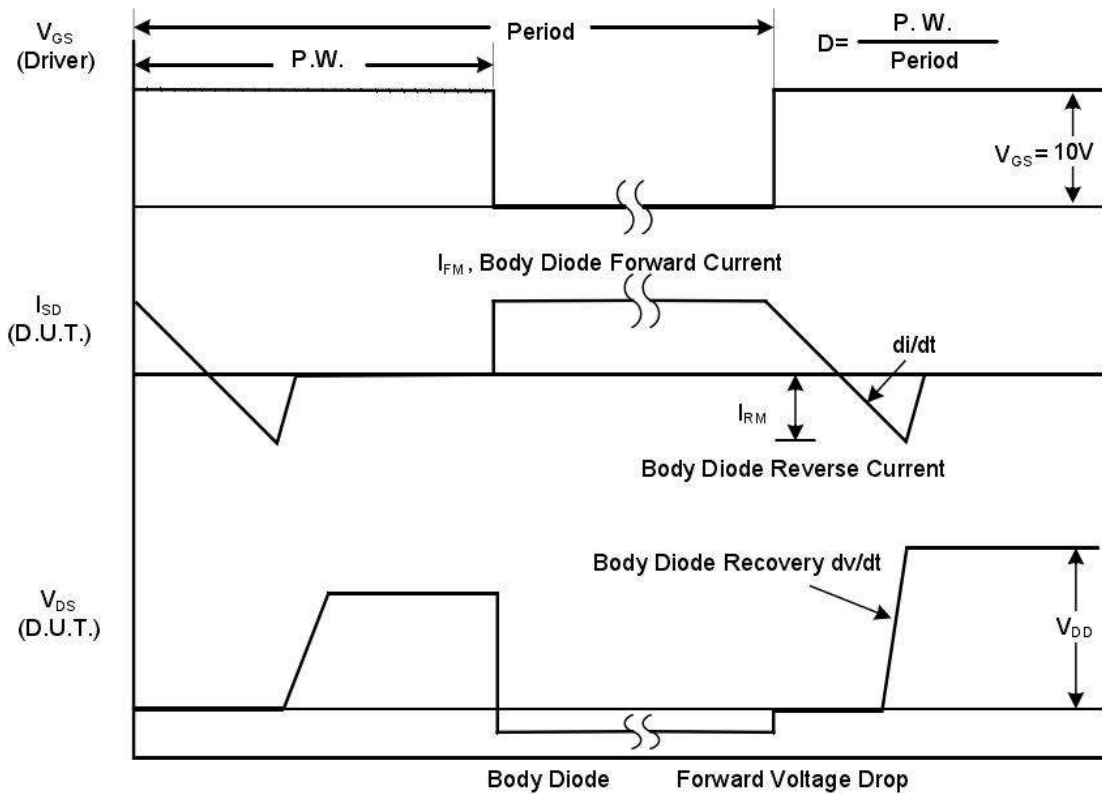
Electrical Characteristics (T <sub>c</sub> =25°C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	60	—	—	V
Breakdown Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =250uA	—	0.021	—	V/°C
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	—	—	1	uA
Gate-Body Leakage Current, Forward	I <sub>GSSF</sub>	V <sub>GS</sub> =20V, V <sub>DS</sub> =0V	—	—	100	nA
Gate-Body Leakage Current, Reverse	I <sub>GSSR</sub>	V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V	—	—	-100	nA
<b>On Characteristics</b>						
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.0	—	2.5	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	—	8.5	9	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	—	13	15	
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1.0MHZ	—	880	—	pF
Output Capacitance	C <sub>oss</sub>		—	255	—	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		—	16	—	pF
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, R <sub>G</sub> =2.7Ω (Note3,4)	—	8.8	—	ns
Turn-On Rise Time	t <sub>r</sub>		—	42	—	ns
Turn-Off Delay Time	t <sub>d(off)</sub>		—	21.5	—	ns
Turn-Off Fall Time	t <sub>f</sub>		—	5.4	—	ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =12A, V <sub>GS</sub> =10V, (Note3,4)	—	18	—	nC
Gate-Source Charge	Q <sub>gs</sub>		—	3.7	—	nC
Gate-Drain Charge	Q <sub>gd</sub>		—	2.9	—	nC
<b>Drain-Source Body Diode Characteristics and Maximum Ratings</b>						
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V	—	—	1.0	V
Reverse Recovery Time	t <sub>rr</sub>	V <sub>R</sub> =30V, I <sub>F</sub> =12A,	—	78	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dI <sub>F</sub> /dt=300A/us	—	192	—	nC

**Notes**

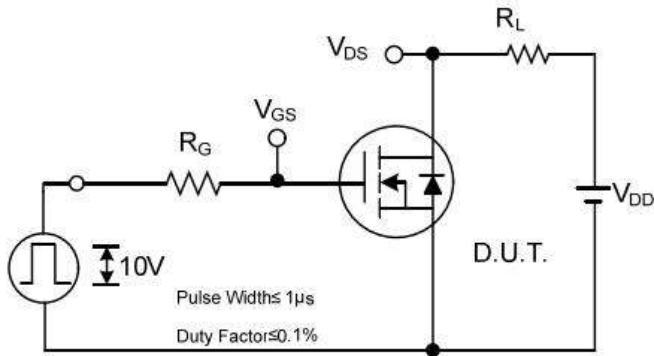
1. Repetitive Rating: pulse width limited by maximum junction temperature.
2. V<sub>DD</sub>=30V, L=0.3mH, R<sub>g</sub>=10Ω, I<sub>AS</sub>=10A, T<sub>J</sub>=25°C.
3. I<sub>SD</sub>≤I<sub>D</sub>, dI/dt=200A/us, V<sub>DD</sub>≤BV<sub>DSS</sub>, starting T<sub>J</sub>=25°C, Pulse width≤300us; duty cycle≤2%.
4. Repetitive rating; pulse width limited by maximum junction temperature.



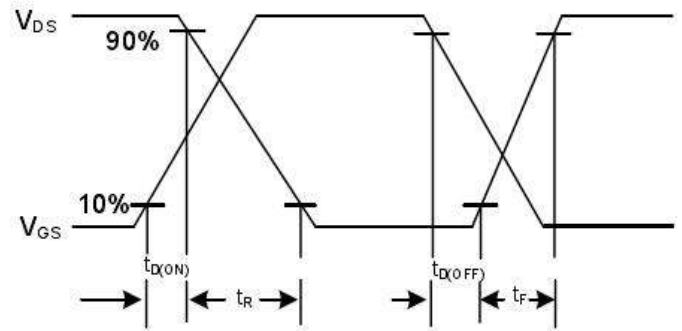
**Peak Diode Recovery dv/dt Test Circuit**



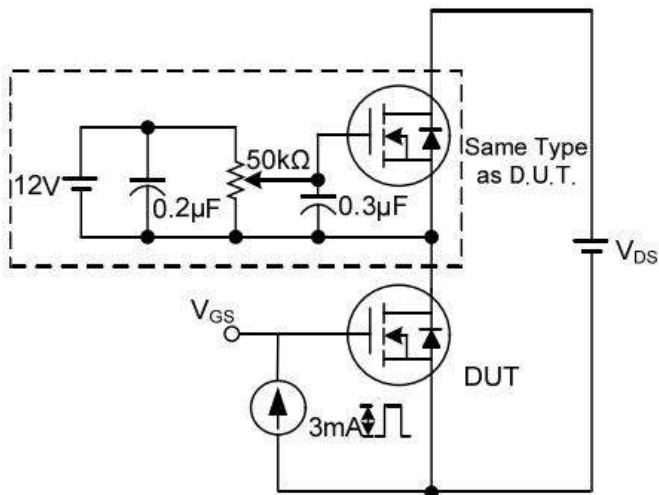
**Peak Diode Recovery dv/dt Waveforms**



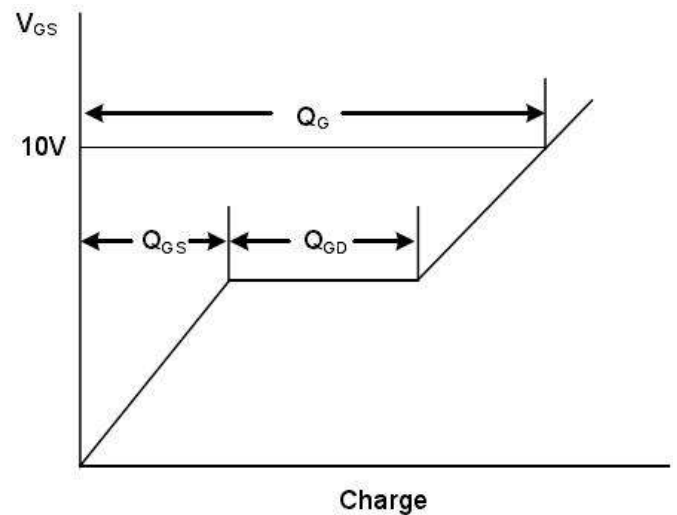
**Switching Test Circuit**



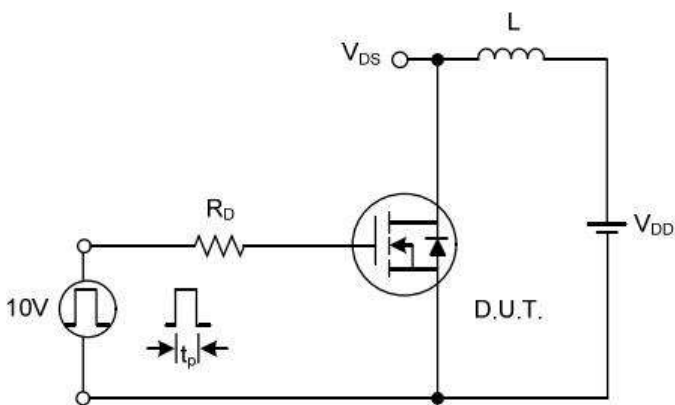
**Switching Waveforms**



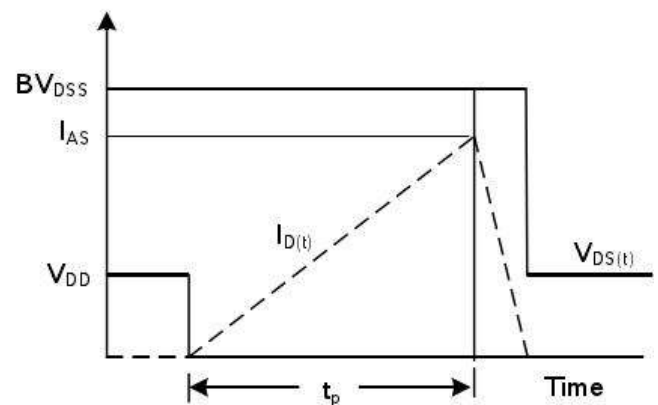
**Gate Charge Test Circuit**



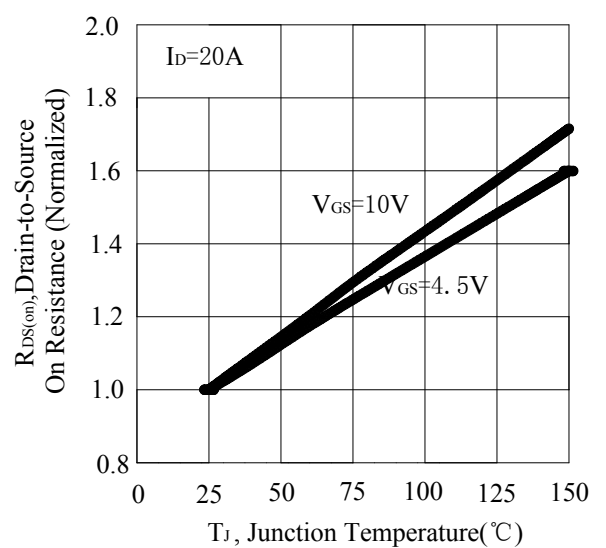
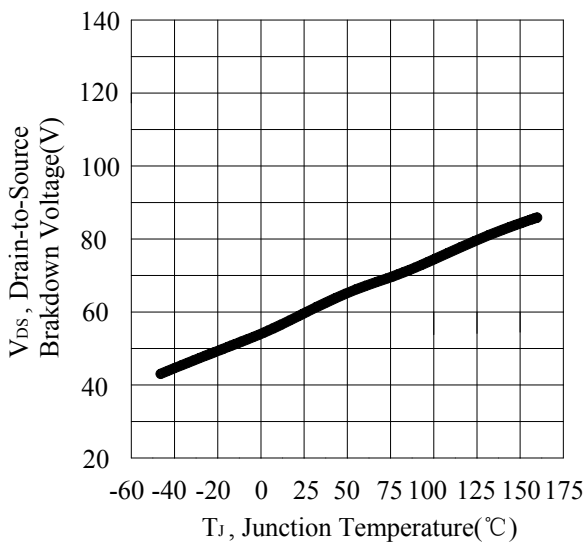
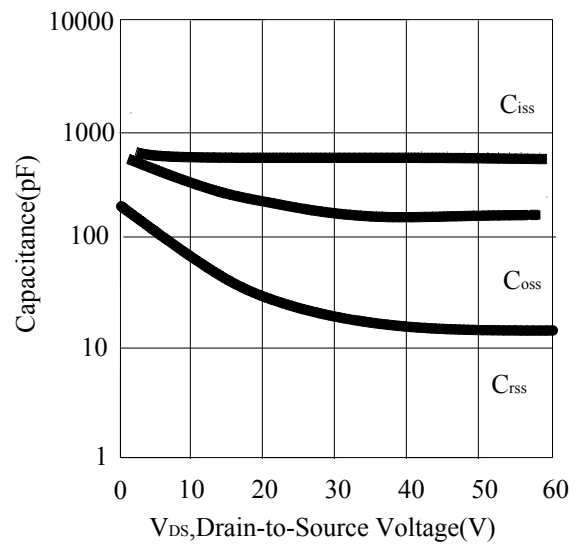
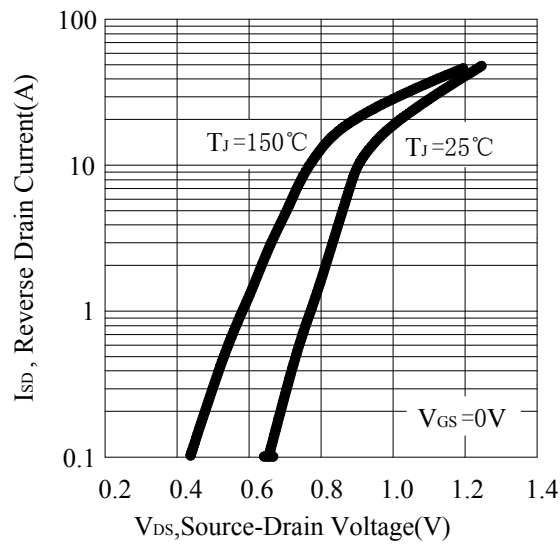
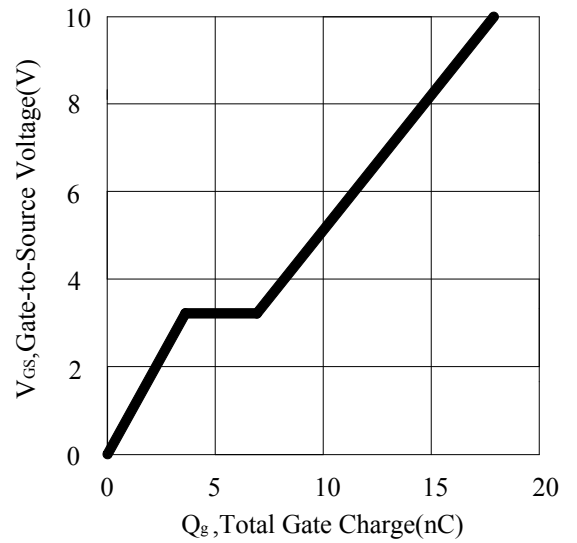
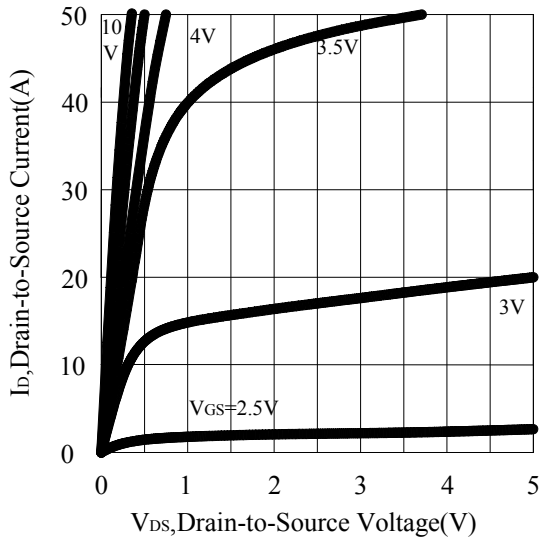
**Gate Charge Waveform**

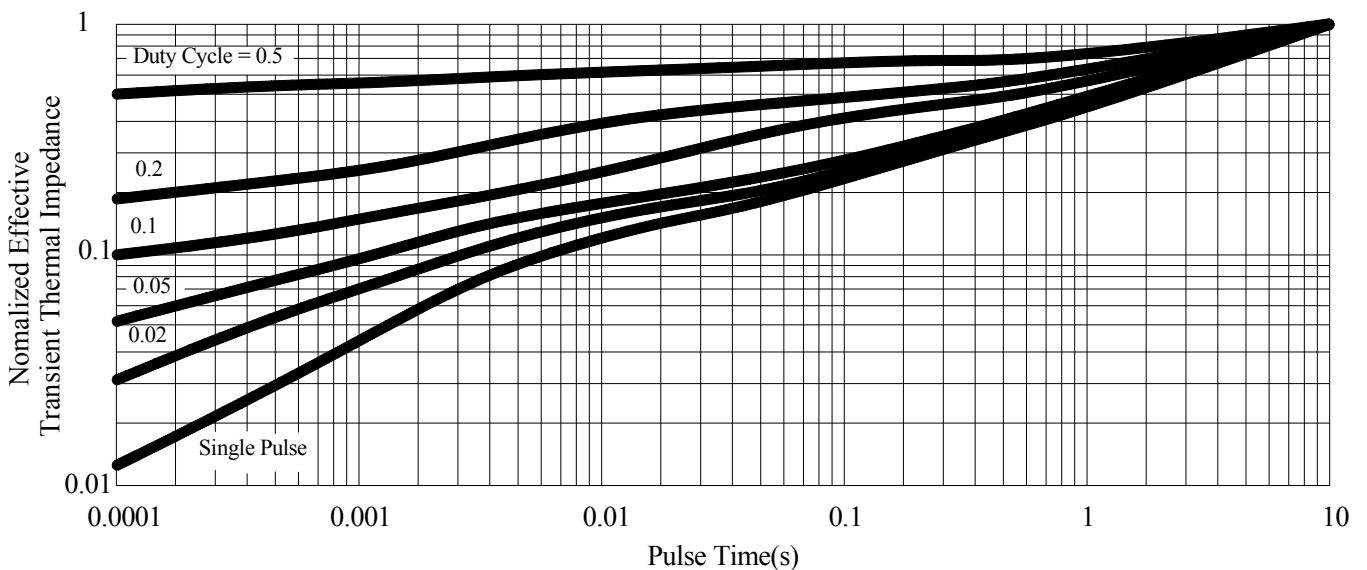
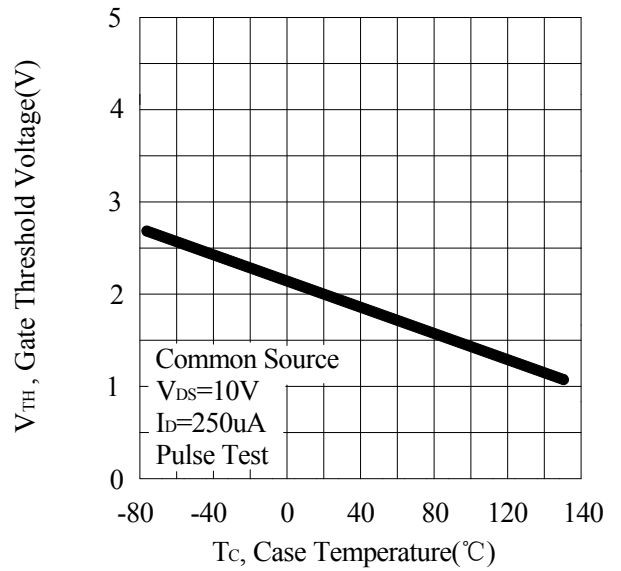
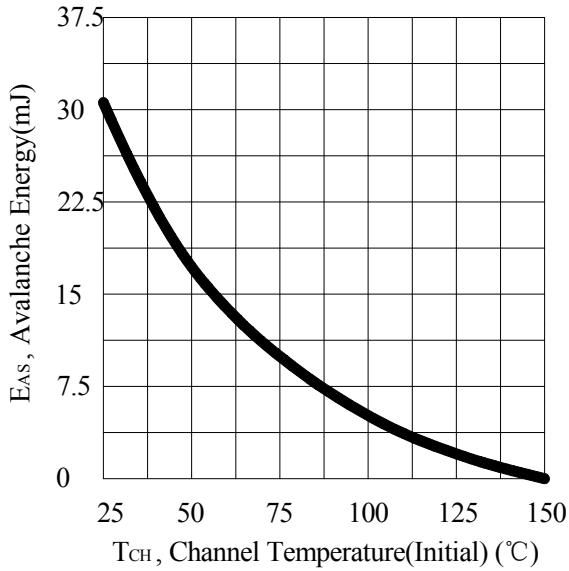
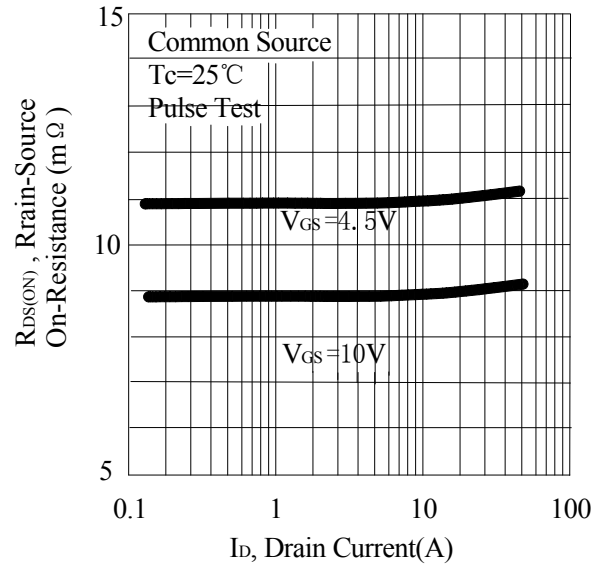
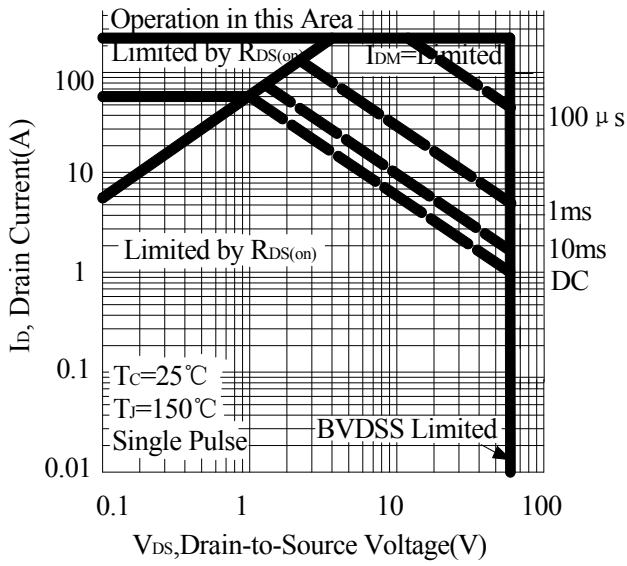


**Unclamped Inductive Switching Test Circuit**



**Unclamped Inductive Switching Waveforms**

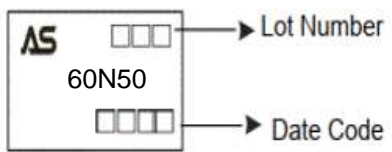






### Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM60N50KQ-R	60N50	TO-252	Tape&Reel	2500/Reel

PACKAGE	MARKING
TO-252	 <p>The diagram shows a rectangular marking area on a TO-252 package. It contains the letters 'AS' in the top left, the part number '60N50' in the center, and two rows of three empty boxes each. An arrow points from the top row of boxes to the text 'Lot Number', and another arrow points from the bottom row of boxes to the text 'Date Code'.</p>

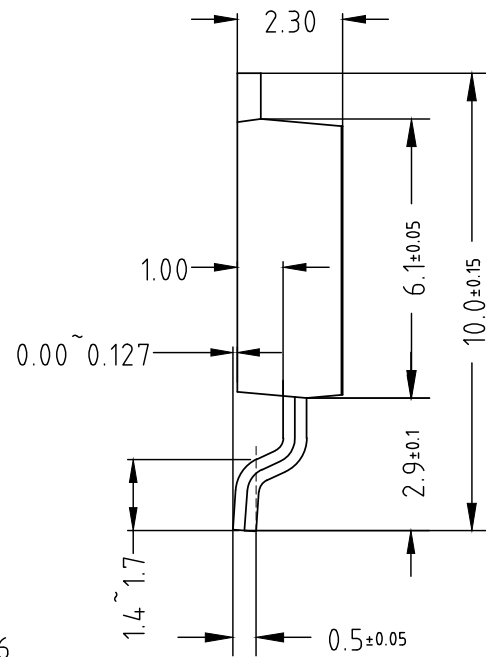
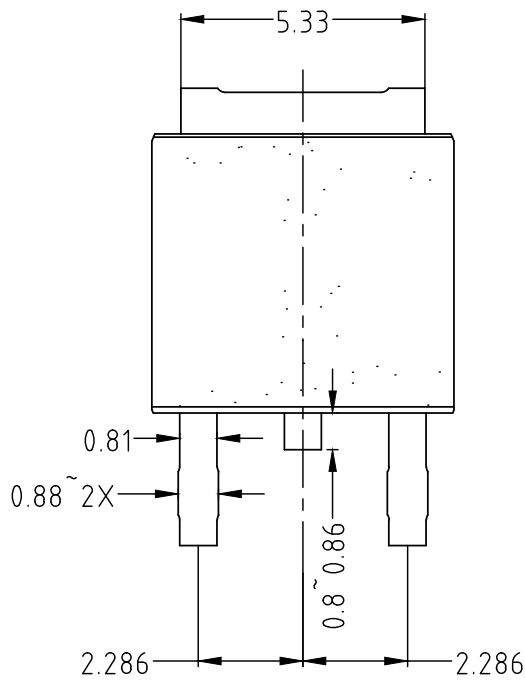
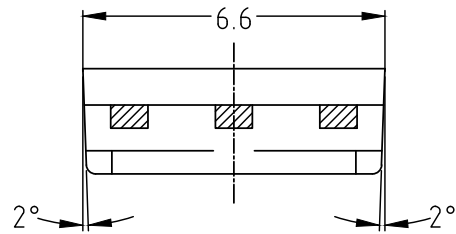


ASCENDSEMI

ASDM60N50KQ

60V N-Channel MOSFET

TO-252





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