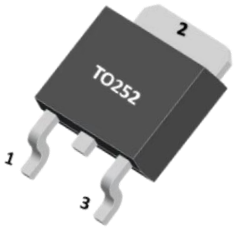
80A, 60V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

■ DESCRIPTION



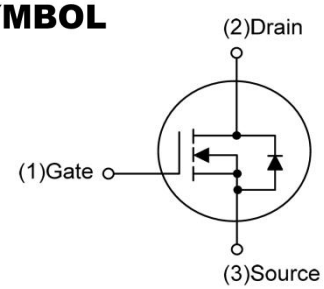
The 80N06 is a N-channel enhancement mode power MOSFET using our advanced technology to provide customers with a minimum on-state resistance and high switching speed. It can also withstand high energy pluse in the avalanche and commutation mode.

The XD80N06Y is suitable for active power factor correction, high efficient switched mode power supplies and electronic lamp ballast based on half bridge topology, etc.

■ FEATURE

* $R_{DS(ON)}$ ≤8.5mΩ @ V_{GS}=10V, I_D=40A
* High switching speed
* Improved dv/dt capability

SYMBOL



■ ABSOLUTE MAXIMUM RATINGS(T_A=25°C, unless otherwise specified.)

SYMBOL	PARAMETER		VALUE	UNIT
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate Source Voltage		±20	V
I_D	Continuous Drain Current		80	A
I_{DM}	Pulsed Drain Current (Note 3)		160	A
E_{AS}	Single Pulsed Avalanche Energy(Note 4)		55	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 5)		3.2	V/nS
PD	Power Dissipation	TO-252	48	W
		TO-220F	80	
T_J	Storage Temperature		150	°C
T_{STG}	Thermal Resistance Fr .0om Junction To Ambient		-55~150	°C
θ_{JA}	Junction to Ambient	TO-252	110	°C/W
		TO-220F	75	
θ_{JC}	Junction to Case(Note 6)	TO-252	2.2	°C/W
		TO-220F	1.88	

Notes: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Drain current limited by maximum junction temperature.

3. Repetitive Rating: Pulse width limited by maximum junction temperature.
4. L = 0.5mH, I_{AS} = 15A, V_{DD} = 20V, R_G = 25Ω, Starting T_J = 25°C.
5. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

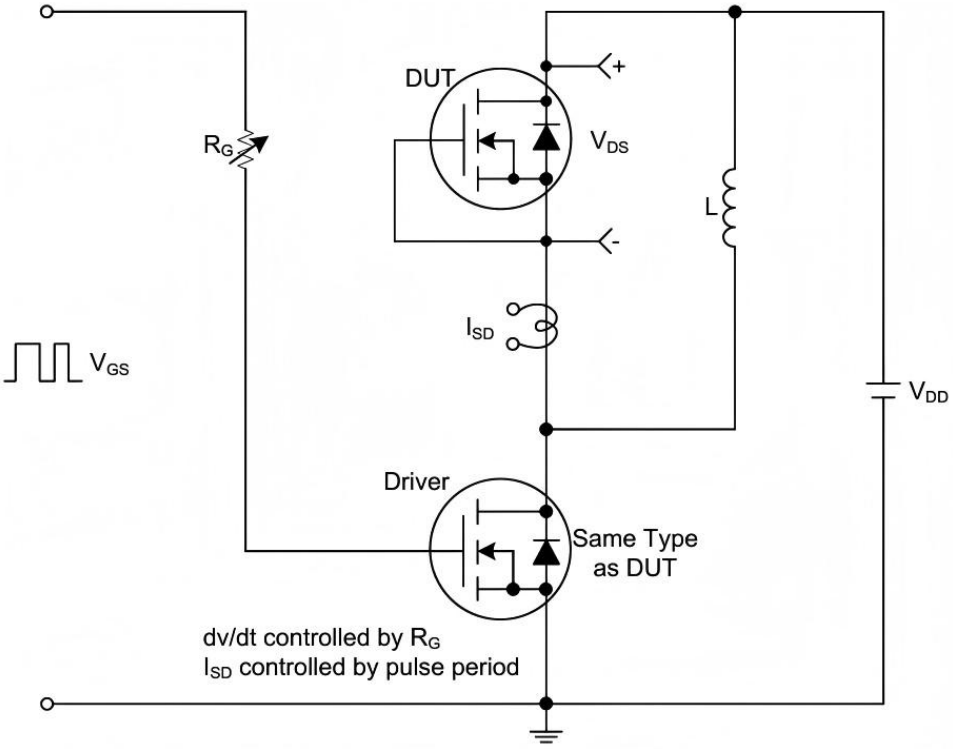
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

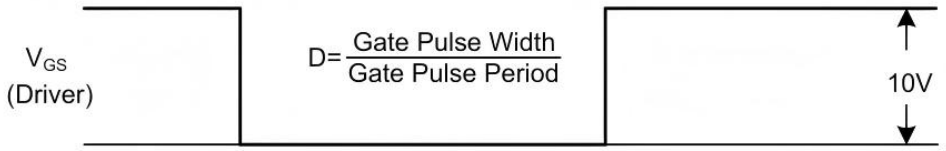
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
Static drain-source on-sate resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=40A		7.5	8.5	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS},I_D=250μA	1.0		3.0	V
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=25V f=1.0MHz		4000		pF
Output Capacitance	C_{OSS}			280		pF
Reverse Transfer Capacitance	C_{RSS}			240		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	V_{DS}=48V,V_{GS}=10V I_D=80A,I_G=1mA (Note 1.2)		130		nC
Gate-source charge	Qgs			19		
Gate-drain charge	Qgd			36		
Turn-On Delay Time	td(on)	V_{DS}=30V,I_D=80A V_{GS}=10V, R_G=3.3Ω (Note 1.2)		17		nS
Turn-On Rise time	tr			20		
Turn-Off Delay Time	td(off)			75		
Turn-Off Fall time	tf			30		
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Continuous drain-source diode forward current (Note 1)	I_S				80	A
Pulsed drain-source diode forward current (Note 2)	I_{SM}				160	A
Drain-source diode forward voltage(Note 4)	V_{SD}	I_S=24A,V_{GS}=0V			1.4	V
Reverse Recovery Time	trr	I_S=30A, V_{GS}=0V dI/dt=100A/μs		52		nS
Reverse Recovery Charge	Qrr			152		nC

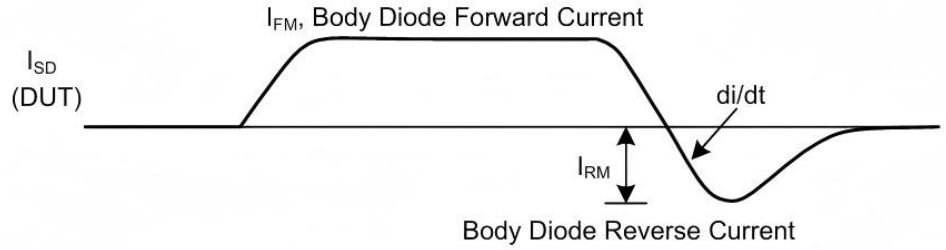
Notes:

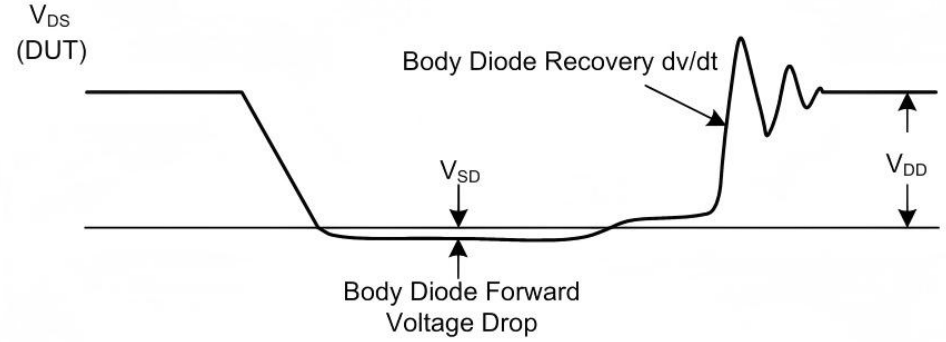
1. Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.
2. Essentially independent of operating temperature typical characteristics.

■ TEST CIRCUITS AND WAVEFORMS



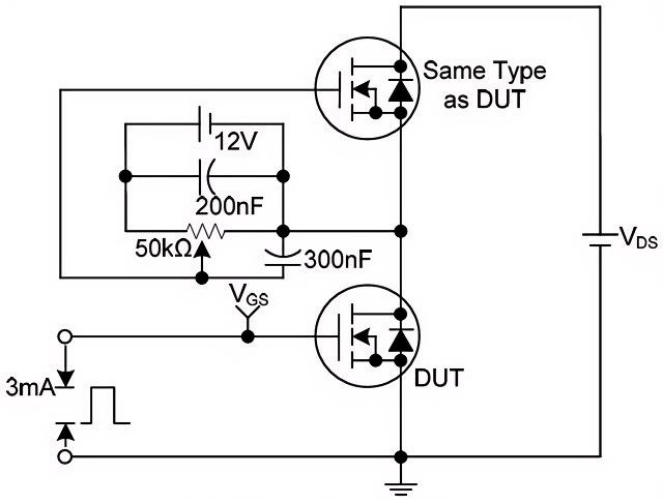




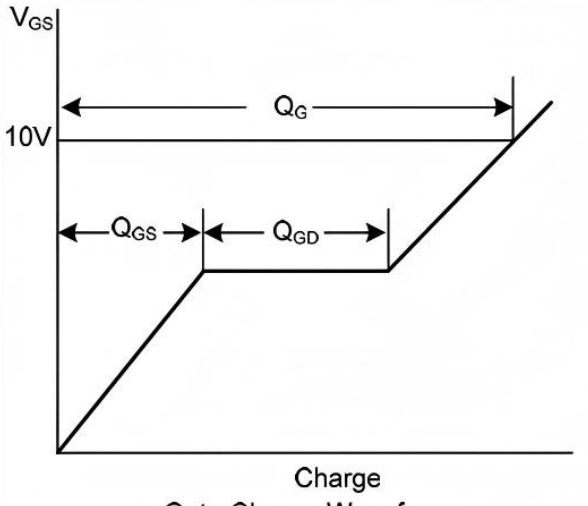


Peak Diode Recovery dv/dt Test Circuit and Waveforms

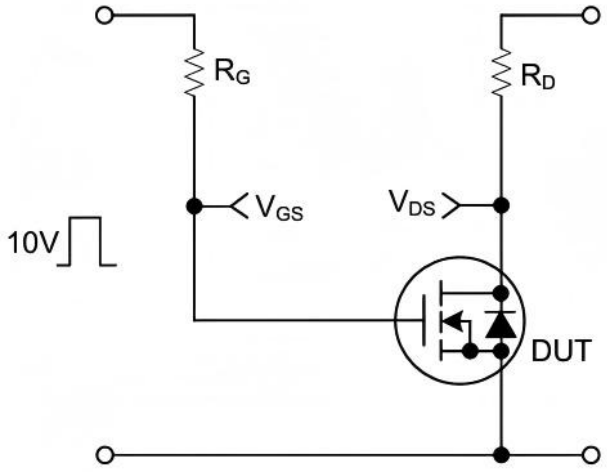
■ TEST CIRCUITS AND WAVEFORMS(Con.t)



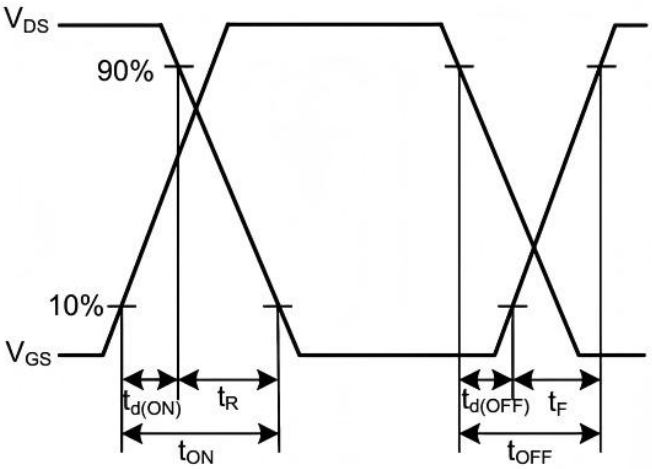
Gate Charge Test Circuit



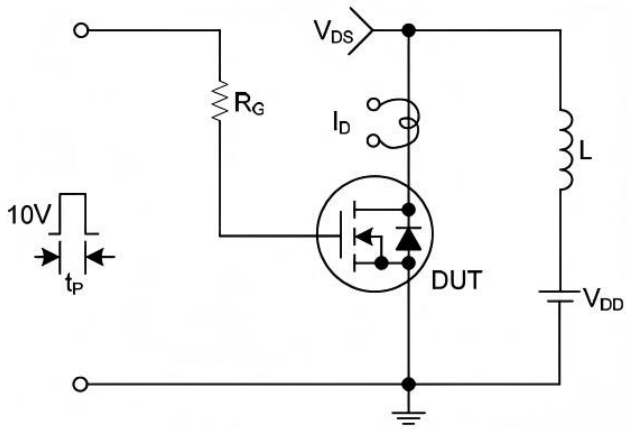
Charge
Gate Charge Waveforms



Resistive Switching Test Circuit

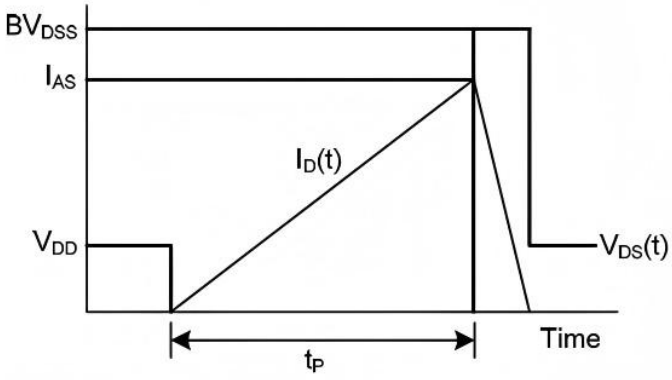


Resistive Switching Waveforms



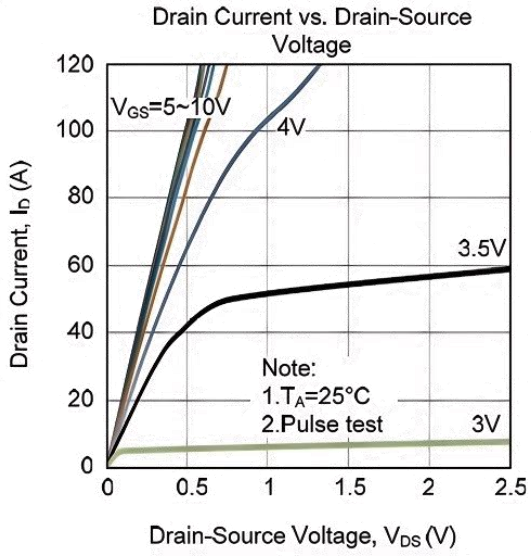
Unclamped Inductive Switching Test Circuit

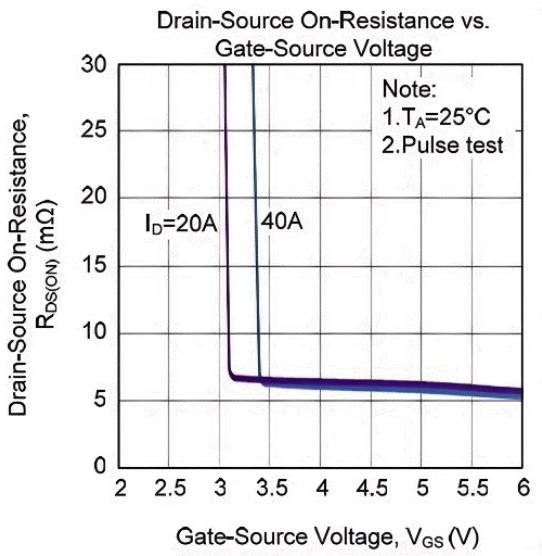
$$E_{AS}=\frac{1}{2}LI_{AS}^{2}\frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

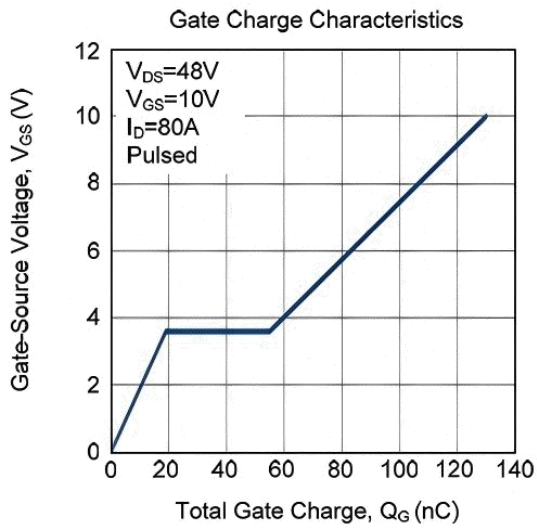


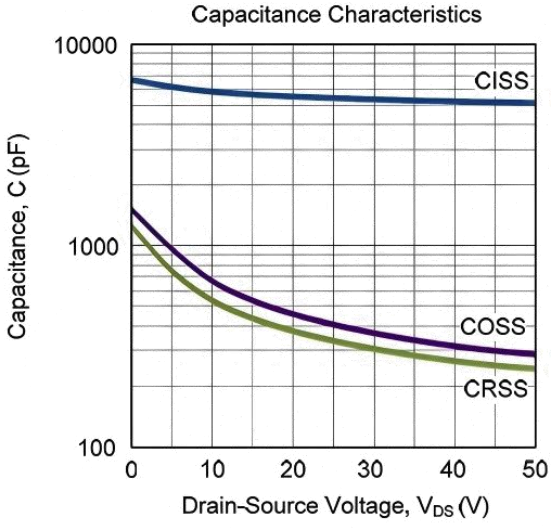
Unclamped Inductive Switching Waveforms

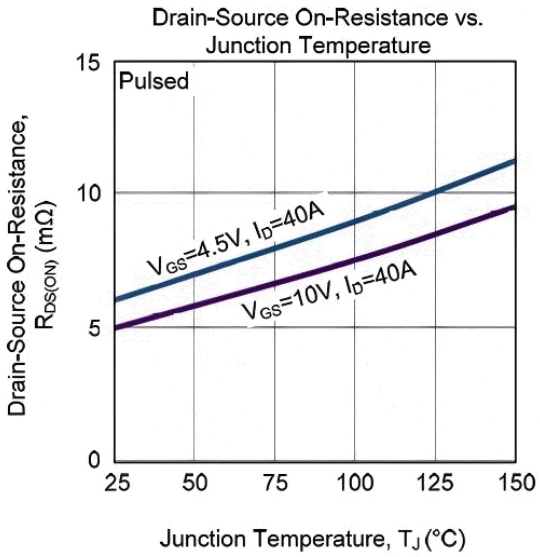
■ TYPICAL CHARACTERISTICS

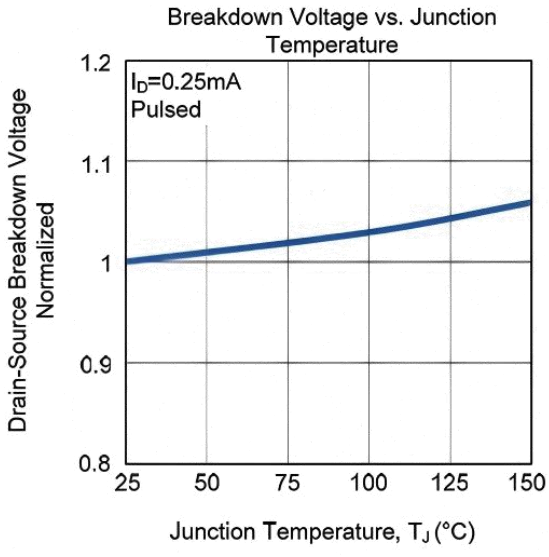




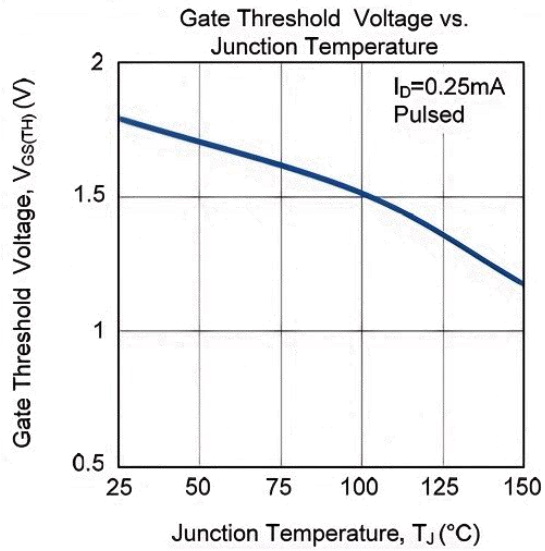


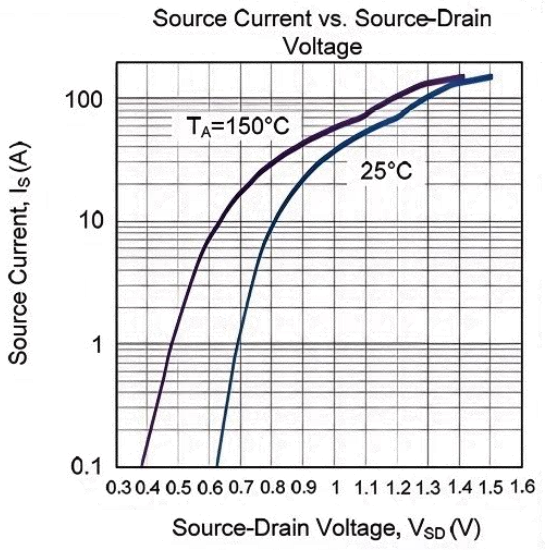


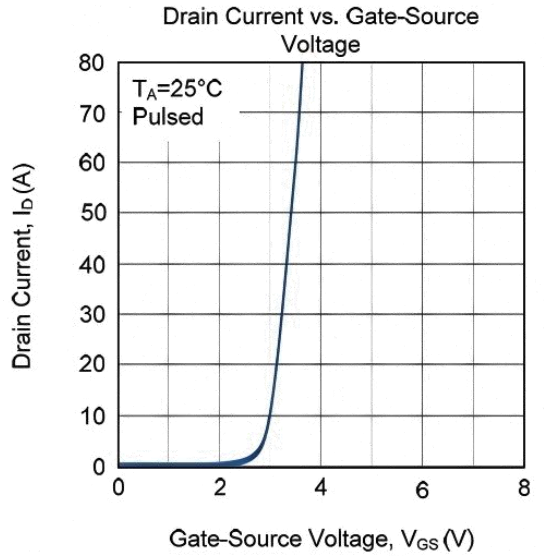


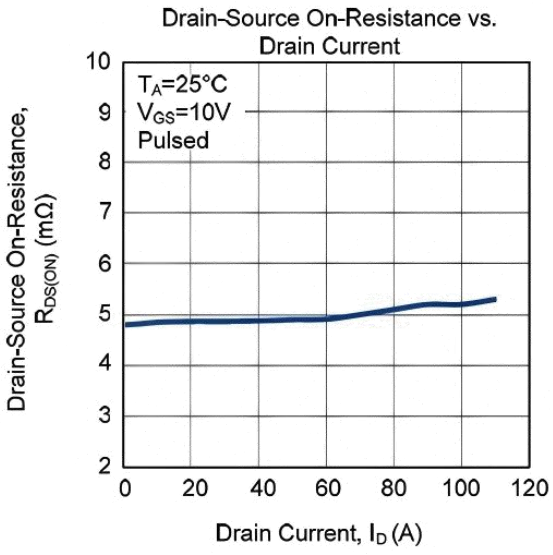


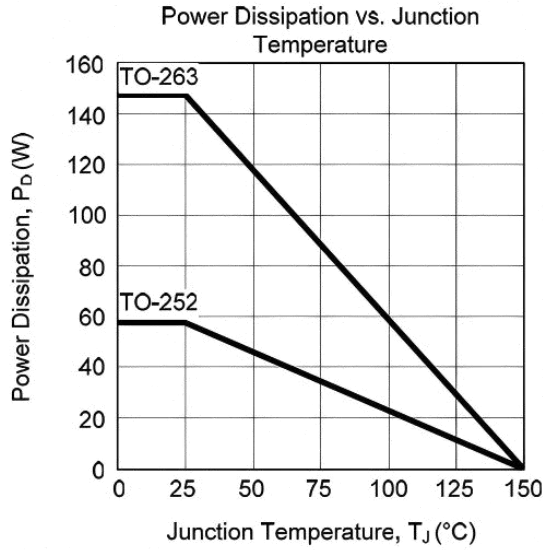
■ TYPICAL CHARACTERISTICS(Con.t)

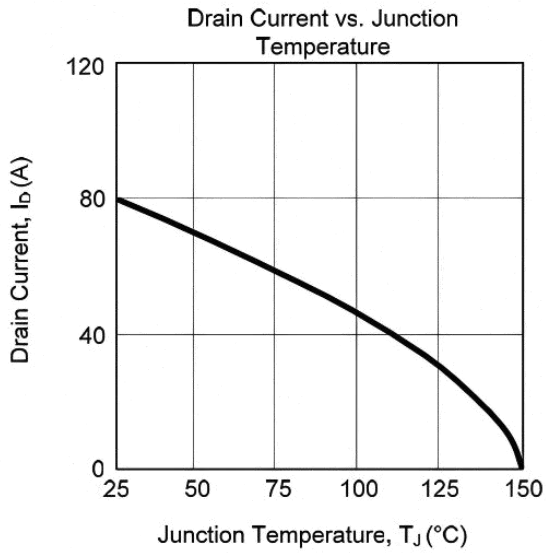




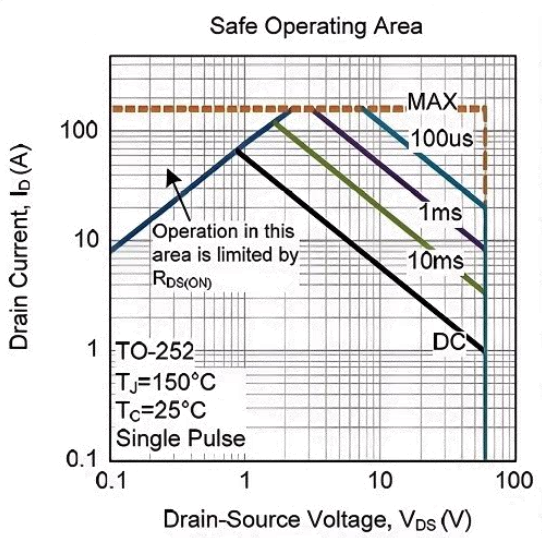




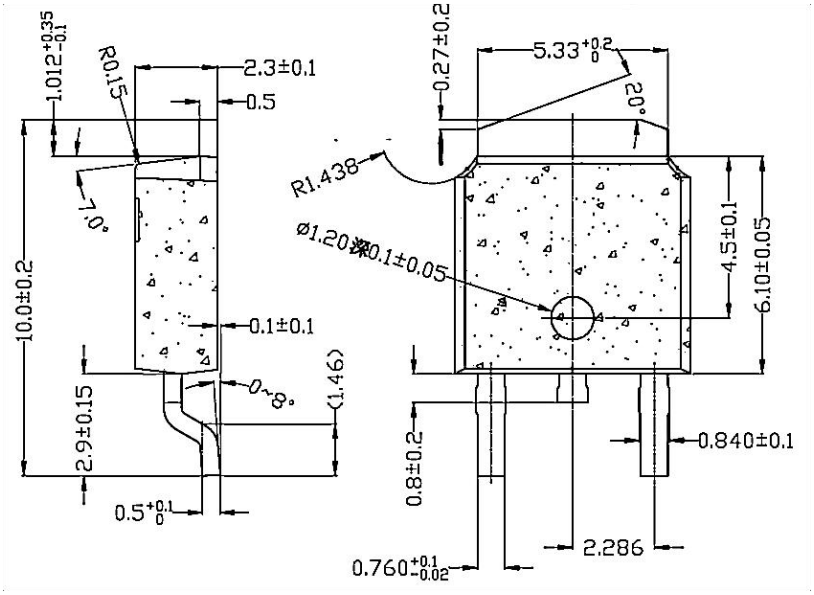


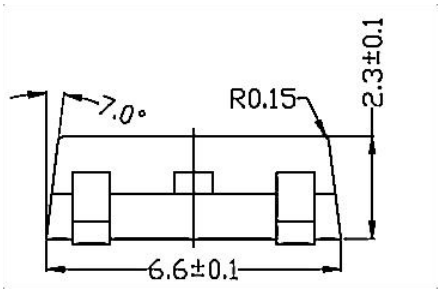


■ TYPICAL CHARACTERISTICS(Con.t)



■ TO - 252 PACKAGE OUTLINE DIMENSIONS





■ TO - 252 PACKING INFORMATION

Package version	Reel dimensions Φ×H (mm)	Per Reel (pcs)	Reels per box	Inner box dimensions L×W×H(mm)	Outer box (pcs)	Outer box dimensions L×W×H (mm)
TO-252	Φ330*20	2500	2	360*340*50	25000	375*375*280