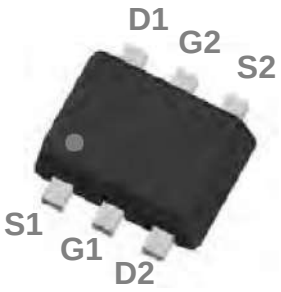
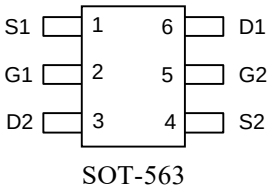
Complementary High Density Trench MOSFET

PRODUCT SUMMARY (N-Channel)

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Max
20V	0.8A	500@ V_{GS} = 4.5V
	0.6A	800@ V_{GS} = 2.5V

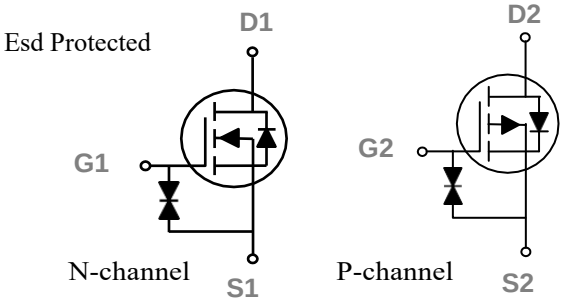




SOT-563

PRODUCT SUMMARY (P-Channel)

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Max
-20V	-0.8A	600@ V_{GS} = -4.5V
	-0.6A	800@ V_{GS} = -2.5V



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	20	-20	V
Gate-Source Voltage		V_{GS}	± 8	± 8	V
Drain Current-Continuous[a] @ T_A = 25 ℃		I_D	0.8	-0.8	A
-Pulse[b]		I_{DM}	3	-3	A
Drain-Source Diode Forward Current[a]		I_S	1	-1	A
Maximum Power Dissipation[a]	TA=25ºC	P_D	0.56		W
	TA=75ºC		0.33		
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150		℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient[a]	R_{thJA}	250	°C/W

Note：
a. Surface Mounted on FR4 Board , t ≤ 5sec .
b. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_A = 25 ℃ unless otherwisenoted)

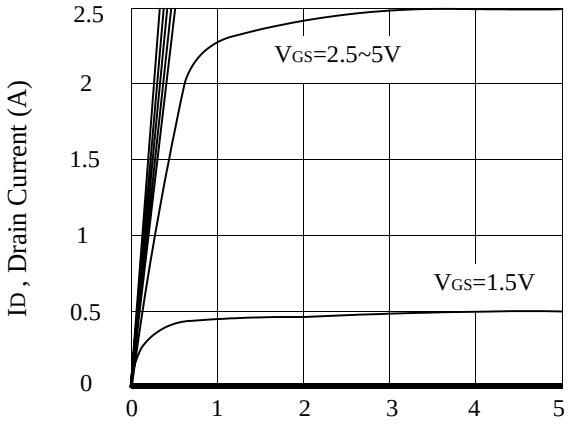
Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = 250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V , V_{GS} = 0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = ±8V , V_{DS} = 0V			±10	uA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250uA	0.5	0.7	1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = 4.5V , I_D = 0.8A		300	500	m-ohm
		V_{GS} = 2.5V , I_D = 0.6A		600	800	
Forward Transconductance	g_{fs}	V_{DS} = 5V , I_D = 0.3A		3		S
DRAIN-SOURCE DIODE CHARACTERISTICS[b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , I_S = 0.3A		0.7	1.2	V
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS} = 6V , V_{GS} = 0Vf = 1.0MHz		42		pF
Output Capacitance	C_{OSS}			23		pF
Reverse Transfer Capacitance	C_{RSS}			19		pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 6V , I_D = 0.3A		5	9	ns
Rise Time	t_r	V_{GEN} = 4.5V		15	42	ns
Turn-Off Delay Time	$t_{D(OFF)}$	R_L = 6 ohm		25	28	ns
Fall Time	t_f	R_{GEN} = 6 ohm		7.6		ns
Total Gate Charge	Q_g	V_{DS} = 6V		3.4		nC
Gate-Source Charge	Q_{gs}	I_D = 0.3A		2.5		nC
Gate-Drain Charge	Q_{gd}	V_{GS} = 4.5V		1.7		nC

Note
b. Pulse Test Pulse width ≤ 300us , Duty Cycle ≤ 2% .
c. Guaranteed by design , not subject to production testing .

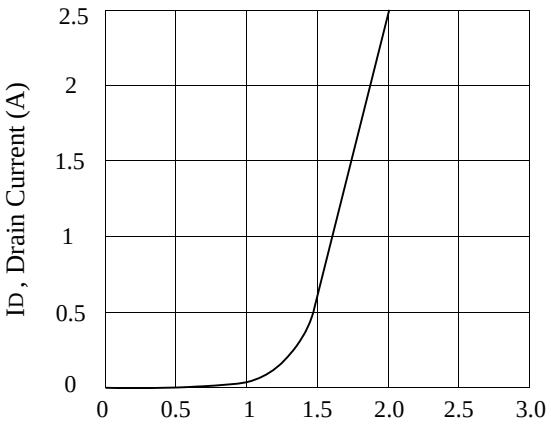
ELECTRICAL CHARACTERISTICS (T_A = 25 ℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = 250uA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20V, V_{GS} = 0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = ±8V , V_{DS} = 0V			±10	uA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250uA	-0.5	-0.7	-1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -0.8A		600	800	m-ohm
		V_{GS} = -2.5V, I_D = -0.6A		800	1000	
Forward Transconductance	g_{fs}	V_{DS} = -5V, I_D = -0.5A		10.7		S
DRAIN-SOURCE DIODE CHARACTERISTICS[b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , I_S = -1.7A		-0.7	-1.2	V
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS} = -6V, V_{GS} = 0Vf = 1.0MHz		50.7		pF
Output Capacitance	C_{OSS}			12.8		pF
Reverse Transfer Capacitance	C_{RSS}			7.1		pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = -6V, I_D = -0.8A		6	9	ns
Rise Time	t_r	V_{GEN} = 4.5V		12	38	ns
Turn-Off Delay Time	$t_{D(OFF)}$	R_L = 6 ohm		27	36	ns
Fall Time	t_f	R_{GEN} = 6 ohm		6.8		ns
Total Gate Charge	Q_g	V_{DS} = -6V		18		nC
Gate-Source Charge	Q_{gs}	I_D = -0.8A		4.2		nC
Gate-Drain Charge	Q_{gd}	V_{GS} = -4.5V		2.8		nC

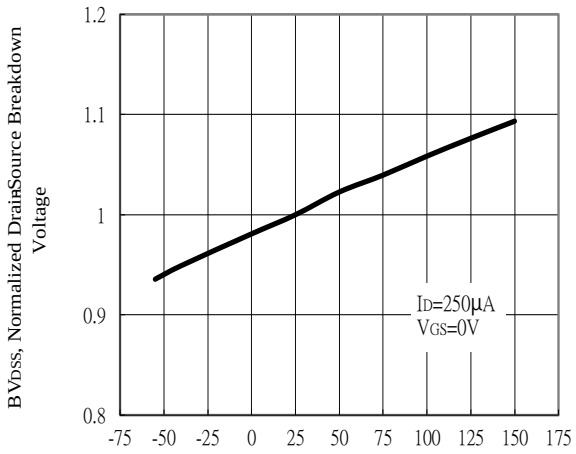
Note
b. Pulse Test Pulse width ≤ 300us , Duty Cycle ≤ 2% .
c. Guaranteed by design , not subject to production testing .

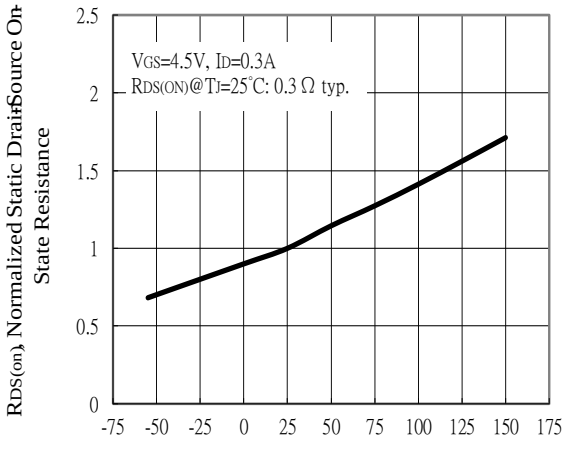


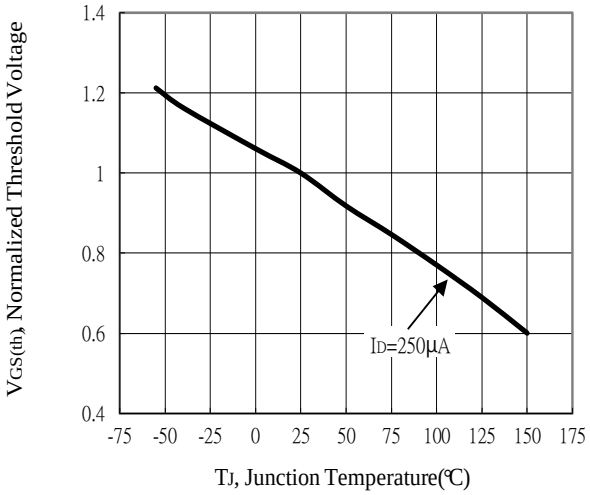
Output Characteristics

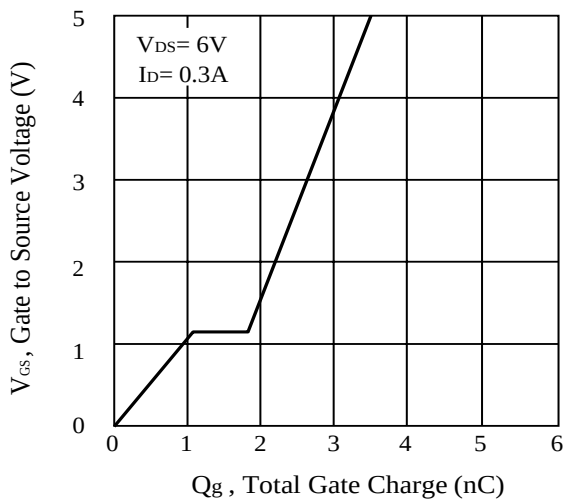


Transfer Characteristics

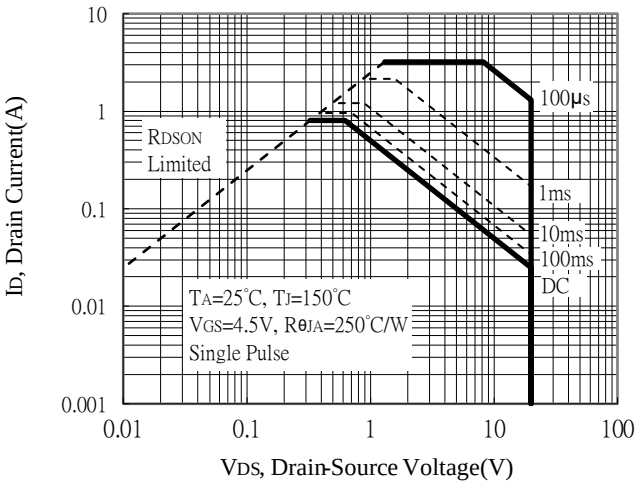




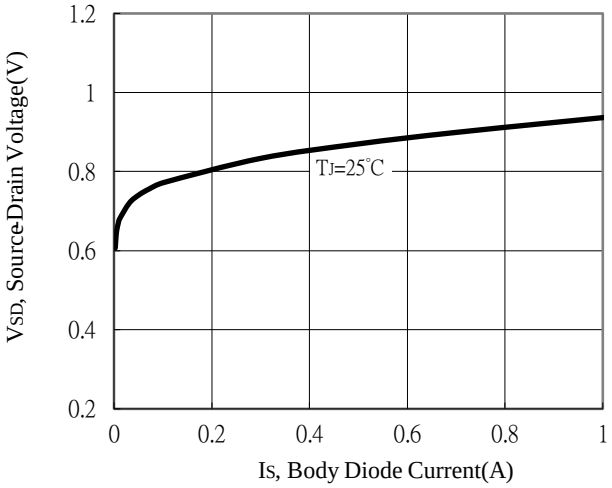




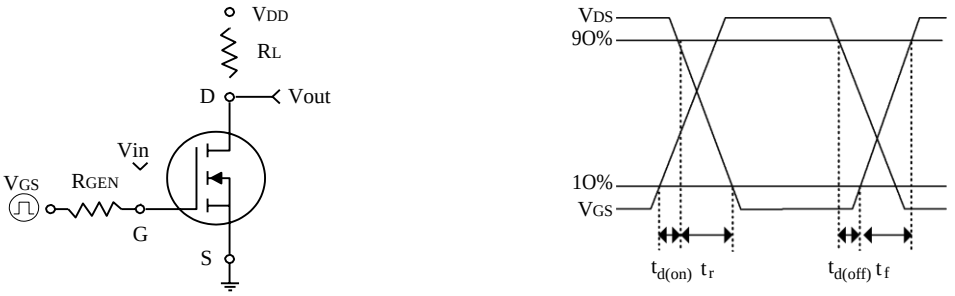
Gate Charge



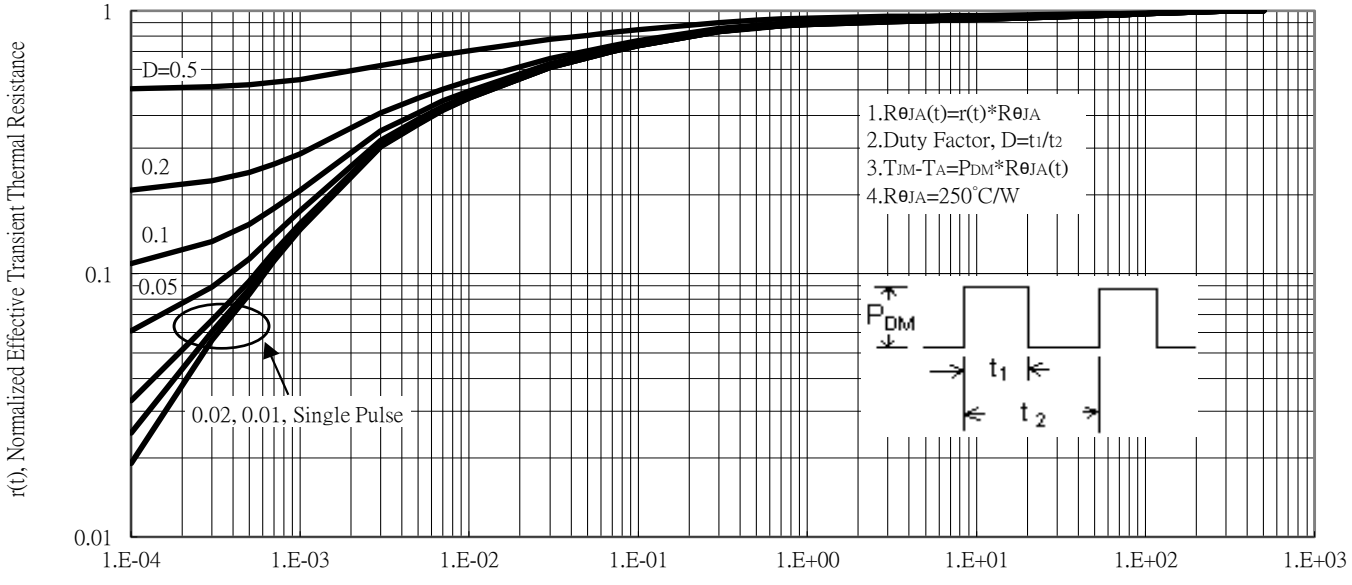
Maximum Safe Operating Area



Body Diode Forward Voltage Variation with Source Current

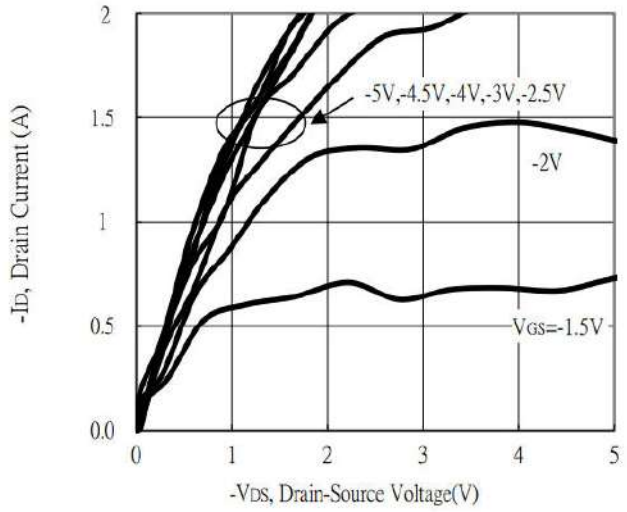


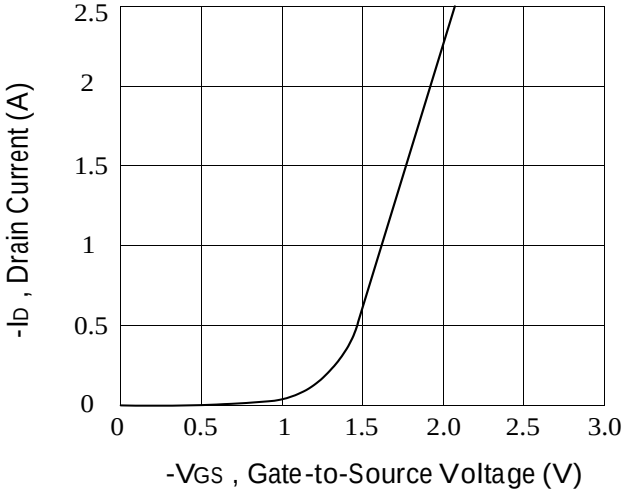
Switching Test Circuit and Switching Waveforms

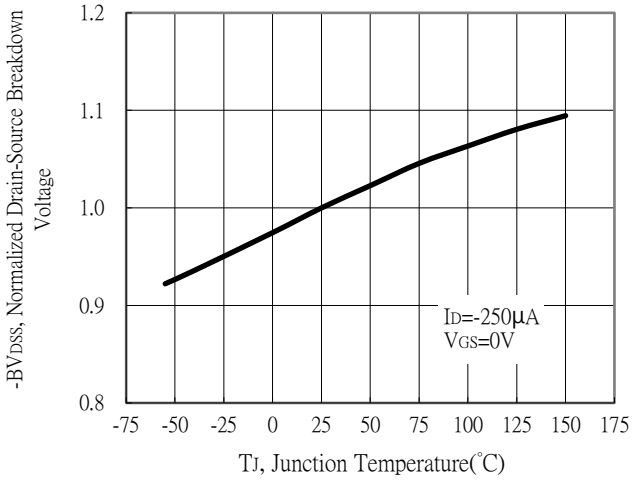


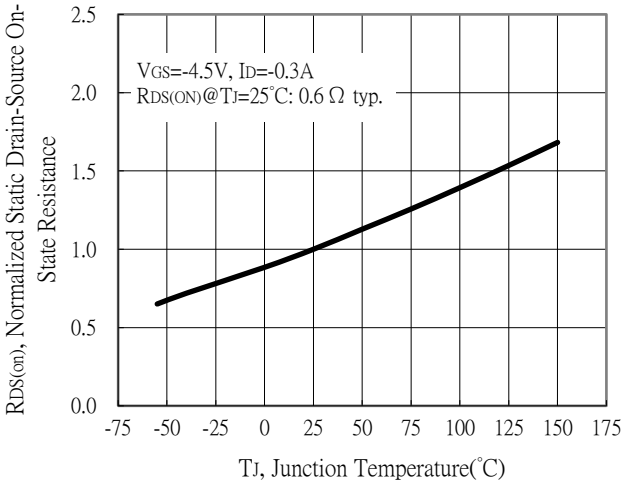
Normalized Thermal Transient Impedance Curve

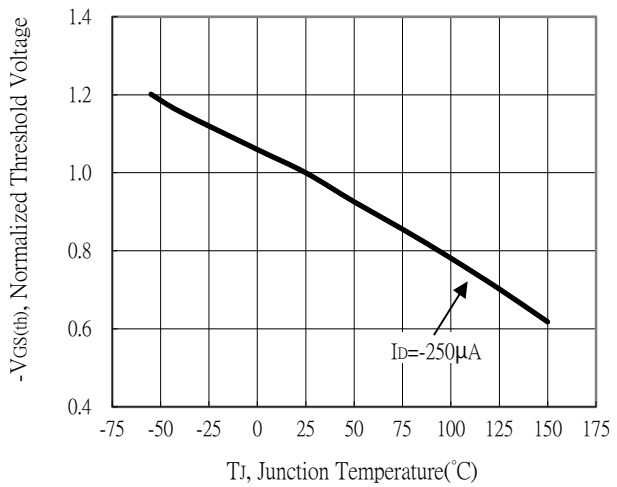
Typical Output Characteristics

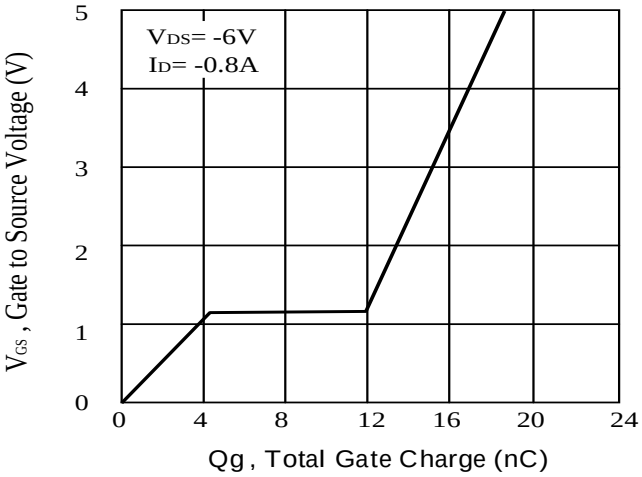




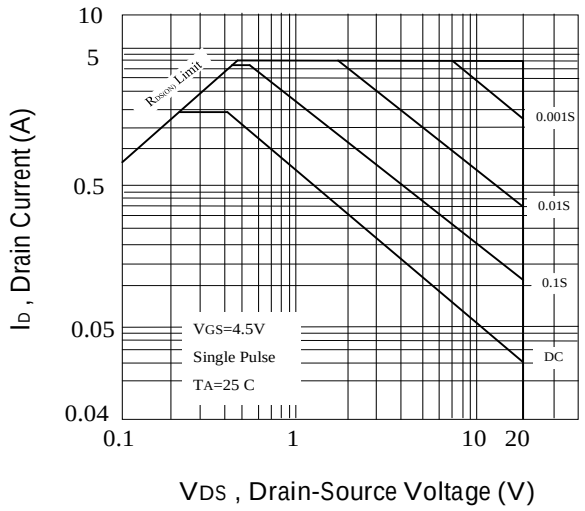




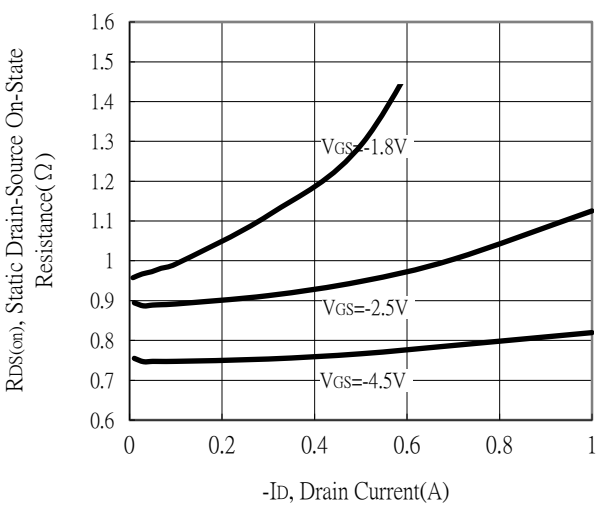


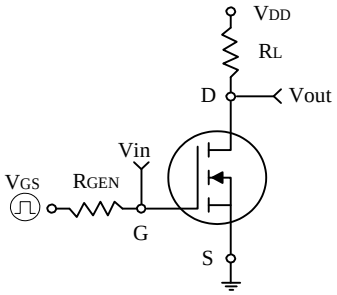


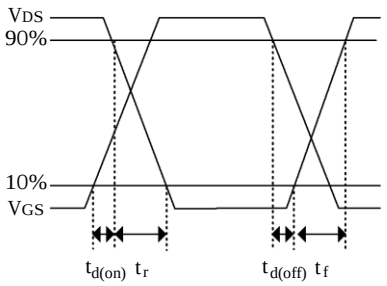
Maximum Safe Operating Area



Static Drain-Source On-State resistance vs Drain Current







Switching Test Circuit and Switching Waveforms

Transient Thermal Response Curves